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That  
Matter



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Carbon taxes may make governments feel good about their commitment to reducing the production of greenhouse gases, but are those taxes an effective way of changing behavior?

There is no doubt they annoy taxpayers. And where does that tax money go? Well, in British Columbia, the money in part goes to low income earners, northern and rural homeowners, and as a tax incentive to industries that reduce their emissions.

According to the government's website, these initiatives help keep BC industries competitive. And finally some of the money is dedicated to supporting investment in eligible emissions production projects.

But are carbon taxes really working? Following the introduction of the carbon tax in BC, emissions did drop. However as of 2014, which is the last reporting year on the provincial government's website, total emissions had pretty much returned to 2008 levels.

An alternative approach to changing behavior is to simply change the rules. The government has the power to tweak, refine, and enhance rules without having to pass bills in the house, rules manufacturers and industry have no choice but to follow. Regulations provide legislators with the ability to force the market into new ways of functioning that taxes do not.

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California is an example. It demonstrates the effect regulations have on the altering of industry and consumer behavior. The push there to move toward electric vehicles has largely come about thanks to a shift in regulations rather than any increase in taxes.

We invited Mark Jaccard, Professor of Sustainable Energy in the School of Resource and Environmental Management at SFU to join us for a conversation that matters about the ways in which we can nudge, control, or force all of us to transition away from fossil fuels.

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- We have some pretty aggressive climate targets, carbon reduction targets in Canada, but what's unclear to me is exactly how do we get from where we are now to where we wanna be by 2030, 2050, and beyond. Is the answer through the taxes or is it through regulation?

- First there's what goes on in terms of our buildings and our equipment, and our cars and our technology, but the key question which you've just asked is how do you actually make that happen? And that's a policy question. It's something that government at different levels will do, federal, provincial, municipal governments, and to what extent should they just do what's called a carbon tax which is you just put a price on gasoline that relates to the amount of carbon in the gasoline and the CO<sub>2</sub> that would come out 'cause that's the main greenhouse gas that's causing climate change. You put a price on that, and if that price gets high enough, people will stop buying gasoline, they'll be buying cars that use biofuels, and we have those out there right now. Drive down the street, you'll see a flex-fuel vehicle. Well, pretty soon, people will be providing ethanol that flex-fuel vehicles can burn. You see electric cars out there right now. People will be buying more electric cars. So you can do it all with a carbon tax. And I, as an economist, am a strong supporter of the carbon tax, however, and there's the however, I noticed when I experienced trying to help people do carbon taxes in different jurisdictions as I did in British Columbia almost 10 years ago, and what political scientists show me is that a carbon tax is a tough sell because people wanna believe alternative evidence or alternative facts when it comes to carbon tax. If someone says, "Oh, "we're gonna really hurt you with the carbon tax," and people say, "Oh yeah, "I'm gonna get hurt with that carbon tax," even though the government says, "Well, here's what we do with the revenue "from the carbon tax, "we're giving it back to you. "There's an income tax cut." In British Columbia we did that, people were as well off and most of them better off with the carbon tax, and everybody thought they were worse off. So the carbon tax was--

- It's because of the psychological impact that the word tax has on you.

- I think that's exactly it. And in fact there are sort of leading political scientists and political economists who do research on that. And I, because of my experience in British Columbia and with our carbon tax, Conversations That Matter is an Oh Boy Productions program.

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and the kind of fake news that came from all sorts of sources about why this was a horrible thing, it made me realize, "Well, let me look at jurisdictions "around the world that have actually "moved quite quickly to reduce emissions." And when you look at that, what you'll find is a lot of regulations. Whether you're talking about Scandinavia, the Swedes regulating how different sectors and communities made electricity and what fuels they use, how they regulated their vehicles, how the Californians have regulated vehicles and fuels and electricity generation. I don't argue in favor of regulation because I think it's superior to carbon tax in any way, whether it's from equity or efficiency, but I argue, let's not ignore it, because actually if you're really trying to hit those ambitious reductions that you've mentioned, that's the jurisdictions in the world that are rapidly reducing emissions in certain sectors have been using regulations.

- So, with a tax, we're basically saying to the end user, you're gonna pay for this. When we introduce regulations, do we shift the onus of the responsibility to the manufacturer?

- That's a good point. The tax shows up in the cost of the final product of gasoline. The regulation tends to go after the fuel provider, the vehicle manufacturer, the electricity generator, the steel plant, and so in a sense that helps it to be more politically or seem more politically palatable.

- I'll get you to hang on for a second while we take a quick commercial break. We'll be right back.

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- So it's my understanding there are about 100 million new automobiles that are manufactured globally every year, but only about 1% of them are electric or are alternative, and that's because most jurisdictions around the world don't have these kind of regulations in place. The easiest and cheapest way for them to go is to create a fuel-burning car.

- You're gonna hear people say, "We've got innovations going on now "to make the electric car attractive." And it's true. The electric car will be attractive in certain uses in a city like Vancouver where I'm just getting from point A to point B, and I'm never gonna travel outside the city. But the gasoline car, the diesel truck is a fantastic device. The energy density of the fuel, the weight of it, the portability of it, the ease of refueling, the power you get from it is fantastic.

- The ability to refill on your trip too.

- To refill on your trip absolutely. So all of these things mean that we have to force the market away from that. Now there are interesting possibilities here. If we look in California, you had a dramatic increase in, some of this is pure electric cars, some of it is plugged in hybrid electrics, and they can run  
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almost most of the time commuting on electricity, but you can still refuel them. They have an internal combustion engine as well for long distance travel. So there's innovations like that. There's also soon with electric vehicles a quick recharging capability that we can start to put on highways like on distance.

- Well, I have to tell you that I was on a road trip down in California just recently, and there were all these Teslas lined up at a Tesla recharging station in the middle of the San Joaquin Valley. The challenge of course is okay what's the load on the electrical grid and then how do we supply that? And so there is a shift that has to take place. But I think your point is that if we regulate that we need to move in that direction, then there is the impetus to do so.

- And then you start to realize that all the things we said, "Oh you can't drive an electric car "from one city to the other." I mean I used to say that five years ago. And so I was always plug-in hybrid electrics instead of just the pure plug-in car, battery electric car. And then now you're learning, oh well, when California makes regulations that lead to more and more of those kinda cars sold, then pretty soon some innovator like Tesla, but it's not just Tesla, says, "I'm gonna develop some rapid recharge," which may not recharge your battery completely 'cause it kinda, but it can get you enough to get you a long distance, while you go in and get a coffee. And so those are the kinda innovations. But to get back to your point about the 100 million cars or whatever it is that are sold every year, that is a huge challenge, but if we just take it on the car side, and we think of where the car sales growth is happening, it's in the developing world, and that's an interesting one, and I'll tell you why. The richest people in India, the elites in China, they live in Delhi, they live in Beijing, Shanghai, that's where the air quality is horrendous, so it is them and their parents, grandparents, their children who are being negatively affected by this air quality. So as we're developing electric vehicles, you're finding that China for example wants to lead the world in the production of electric vehicles, and is exploring regulations right now to phase out gasoline vehicles used in their big cities. So there is the impetus for this, the technology. So the impetus being air quality, not necessarily greenhouse gas reduction, but it'll both happen, and there's the impetus for it, and then there's the drive from where the real growth in vehicles will happen which is China, India, and so on.

- Well, China and India though have to stop producing electricity by burning coal.

- Right.

- For it to really have an impact. And so that's the other part of that equation.

- Right.

- And so then that has to become economically, I guess viable or attractive to those governments.

- And so what you'll see is coal use in China was going like this, right? And it's not now. It's like this.

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- Yeah because they've stopped building new coal fired electrical generation.

- India started it, and they started closing down the older ones, so they're doing lots of renewables, wind and solar, they're expanding nuclear, they are putting in a little bit of natural gas, but it's mostly, yes, the stopping that growth in coal. And then finally you mentioned about, okay, what about the grid, how do we refuel electric vehicles? Recharge them. That's not gonna be very difficult actually. The fortunate thing for electric vehicles is we already have a transmission system, a grid. And so in every home has electric current coming into it. So, yes, you're gonna have to reinforce, but the rates of reinforcement, of producing electricity and transmitting it can grow with your electric vehicles. And the cost for that will have almost no effect on your electric rates.

- This is our second break. We'll be back in a moment.

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- The energy transition is underway, like we're moving forward, it's gonna take time. But we don't necessarily know where we're transitioning to. We need to still discover what some of those new innovations are. From your perspective, do we have what we need to be able to move where we need to go to, or does there need to be an ongoing investment in new innovations that will allow us to have a greener economy?

- Actually we could in Canada alone do what the federal government wants which is a 80% reduction in greenhouse gases between now and 2050 with no technological innovation whatsoever.

- None?

- None.

- It almost seems counterintuitive to hear that.

- Well, that's because industry wants you to believe that we need innovation to reduce our emissions. So the first thing you should ask industry is from 1984 to 1994 why did greenhouse gas emissions in Brazilian transport fall by 50%? So let's just stay on that for a while. Why did it fall back?

- I didn't even know that they had.

- Yeah.

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- So why did they?

- Well, they just decided they didn't wanna import oil anymore. They weren't producing their own oil. Now they have a lot of oil. And so they started to use sugarcane to make ethanol, and then the government regulated that those are the kind of vehicles that the industry had to sell. And it regulated that the price of ethanol had to be cheaper than the price of gasoline, and people all switch to ethanol. And so what we who measured greenhouse gas emissions saw them plummet. So then here's another one. Then you'd have to ask, why did greenhouse gas emissions from the electricity sector in France from 1980 to 1990 fall by 90%?

- It has to do with stopping burning coal.

- Yeah, they built nuclear plants.

- Yeah. Now there's a fear about that. And we won't do that in British Columbia.

- Fine, but, okay, why, so in Ontario, without building any new nuclear plants, why did greenhouse gas emissions from the electricity sector in 2004 to 2014 fall by 90%? 90%. Greenhouse gas emissions in electricity in Ontario fell by 90%. They phased out the coal plants. They replaced it, they ran their nuclear plants a bit better, but no real increase. They got a hydro power contract in from Quebec. They did more energy efficiency. They put in some natural gas, but hardly used any of it. It's to back up a whole bunch more wind and solar. They did some run-of-river hydro, they did some biomass, burning wood in one of the old coal plants, and their emissions fell by 80 or 90%. Where was the technological innovation that was necessary for this to happen? So now I've just given you transportation and electricity, I can give you other sectors around the world where it's so easy with the technologies we have, but nobody wants you to believe that.

- And what you're describing about Ontario, you don't necessarily even have to regulate that. That just becomes policy changes in the sense that we as the Hydro or the Ontario Hydro, choose to do it this way.

- That's a good point. I'm calling that a regulation, but I think you're quite right to qualify what I'm saying because if it's a publicly owned entity, then I mean you are kind of regulating yourself in that sense. So in British Columbia, we put in a clean electricity requirement in January of 2007, just at a time when--

- The Clean Energy Act, right?

- No, this was three years before the clean energy.

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- [Stuart] Before the clean energy okay.

- And this is a time when BC Hydro had signed contracts for two coal plants to be built in British Columbia, right? And when that policy came in which I worked hard for and Gordon Campbell implemented it, I think they made the decision in the cabinet meeting in December of 2006, so it was announced in January 2007, and then BC Hydro had to tear up those contracts and--

- Thankfully.

- Thankfully

- I'm glad they were not burning coal in British Columbia.

- Exactly, but I mean at the time people were, BC Hydro should be kept arm's length from the government. So what I'm saying is the government kind of regulated its own utility, but it was a regulation that would also affect other utilities if someone wanted to generate electricity whether it's forested out in the Kootenays or whatever. So your point is well-taken. In Sweden for example, every community has a community utility that burns something to make hot water that goes through the pipes to heat the buildings and factories and so on, and it generates electricity, so we call that combined heat and power. We have some of that in Canada. And the Swedish government, the central government, said you guys need to switch fuels. And so all those plants that burned coal switched over to forest wood waste.

- So.

- And the emissions went like this.

- Third and final break and we'll get quickly back to this fascinating topic. We'll be right back.

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- How we're doing nationally at the moment then in hitting our targets, and do you remain hopeful that we can get to where we need to be by 2030 and 2050?

- Right so, people are critical. We can be critical of governments anywhere, and I can mention the provincial government, and Alberta governments and so on, but if we talk at the federal national level, the criticism that people raised to our federal government is that it's inconsistent if it's approving oil pipelines that would allow expansion of the oil sands, while also saying we're trying to reduce emissions. Conversations That Matter is an Oh Boy Productions program. Please help us to continue to produce this program by making a donation at [www.conversationthatmatter.tv](http://www.conversationthatmatter.tv)

I'm not as critical as that because I think being a politician is about trade-off and it's not easy. The federal government thus far has been making a very significant effort to reduce emissions. They have announced carbon pricing, politically unpopular with Saskatchewan and basically with all different areas in the country, so they've been willing to take a political hit for that. So they're saying that by 2022 if they're reelected, that price will be up to \$50. Today in British Columbia it's \$30.

- For a ton?

- For a ton of carbon dioxide emissions. So the federal government is taking a lead role here. And actually as of yet this year, the provinces, Saskatchewan and so on, need to start out and get the first \$10 per ton. So, that's good. And then simply the point I was making to you earlier was that that's not enough, you need, unless you're gonna get that price going, so I did a study that showed that price has to hit \$200 by 2030.

- To have real impact?

- Yeah, and that would add 40 cents a liter to the price of gasoline. So if the price of gasoline is \$1.40, it would be \$1.80, then you get a lot more electric cars, biofuel cars. But you'll get unelected. You won't survive. And so they're also doing regulations, and the regulations they're doing are gonna have a huge effect. So they're doing the phase-out call by 2030, and basically the provinces are kinda buying into this, Alberta bought in, Saskatchewan is more reluctant, but even Nova Scotia out there like, well, you gotta help us out, but they're gonna buy in. That's huge. Huge, so suddenly electricity across the country, not just in BC, Manitoba, Quebec, will be zero emission electricity. Get your electric car. So they're doing that.

- And that's where electric cars really makes sense.

- Well, yes, but they do anyway because they're a way more efficient engine. So even if you--

- Yeah, it transfer power to the, yeah.

- Even if you burn coal, in Indiana if 50% of your electricity comes from coal, you still reduce emissions by buying an electric car 'cause its engine, it's motor is so much more efficient than the gasoline internal combustion engine. So it's a long calculation but.

- I've always wondered about that, and I'm glad that you cleared it up. So thank you.

- So I have to clear that up a lot 'cause people will always say, "Well, we're burning coal to make electricity, "then an electric vehicle is a bad thing." And it's a benefit. The more your electricity is zero emission, then of course the better to get an electric car. But even if you're having quite a bit of

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emissions when you generate electricity, the electric car can still be superior to an internal combustion engine. We have to do the calculation, that's all. But anyway, so my point was that what are the federal, what's the federal government doing now? So they have said, "Well, we adopt what Alberta "was starting with a methane regulation," 45% reduction, that's huge. The coal plant phase-out by 2030, that's huge. And then they're saying we're gonna do this what's called the clean fuel standard, but I'm sorry, everybody seems to have to have a new name for the same thing. So I was just telling you about California's low carbon fuel standard and British Columbia has a low carbon fuel standard that forces fuel providers to reduce the carbon in the mix of fuels they provide. So if I'm the gasoline provider, I've gotta pay money to someone to subsidize someone to sell renewable, to sell ethanol or biodiesel, or hydrogen or electricity. And the federal government is designing a policy like that. And I and others are involved in that process just as people giving input.

- I appreciate your insights, thank you very much.

- You're very welcome, my pleasure.