

00:11

This is a lump of coal. It was mined a while ago in the Ruhr region in Germany, about 50 miles from where I grew up. As coal goes, it's actually quite high-end. It's very dry, it has a high share of carbon in it. Both those things mean you can't only burn it to produce power and heat, but you can use it to make steel. Now why am I telling you this? By the end of this talk, I want to have convinced you that we can make a huge step forward in the great fight against climate change by just spending one to two percent more on things that we buy. And the path of this coal is going to help me with it.

00:46

But ... back to steel. What you have to know about steelmaking is that it's a humbly brutal process. These huge furnaces that tear apart and recombine elements and materials that have literally been around for millions of years, at temperatures of up to more than 2,000 degrees Celsius. It's a triumph of industrialization, but it's terrible for the climate. More than five percent of all man-made emissions currently come from making steel. And of all the many challenges we face to save the climate, this one's particularly hard to solve. Now, why is that?

01:22

The first reason is technical. There are technologies to produce low-carbon steel. We can, for example, capture the CO₂ and pump it back under the earth -- that's called carbon capture and storage. Or we can move to entirely new processes that, for example, run on low-carbon hydrogen instead of coal. But all of these are currently only at a piloting stage.

01:40

The second reason is economical. This is likely going to be expensive. And to illustrate that, let's compare the steel challenge to that of companies in other sectors. If you're in, say, manufacturing, most of your emissions come from the power you consume for things like conveyor belts, robots, drives and so on. You can eliminate them by switching to renewables, which isn't that expensive anymore. In most cases, this won't cost you more than 10 euros per ton of CO₂, probably a lot less. Other companies have more energy-intensive processes that require a lot of heat to operate. They generate more emissions by burning fossil fuels directly, and that's more expensive to get rid of.

02:21

Now let's assume, across all of their processes, it costs them, on average, five times as much, somewhere between 40 and 50 euros per ton of CO₂. Now if a steel company wants to move to

zero emissions, it either needs to invest significantly in upgrading all of its current plants and into infrastructure that transports CO₂ from its plants to a storage site, or it needs to close all its plants and build entirely new ones that, for example, run on low-carbon hydrogen. According to industry studies, this can cost them 10 times as much, in the ballpark of 100 euros per ton of CO₂, and the costs for a ton of steel could increase by as much as 50 percent.

03:02

Now, to make matters even worse, our steel company operates in the commodity business; it almost exclusively competes on price. And it has shitty margins already: that means saving CO₂ is expensive, but its profit per ton of CO₂ is very low, and this puts it in the uncomfortable company of only a few other sectors, the so-called hard-to-abate sectors club, all the industries like cement and chemicals, that have equally messy industrial processes and require very high temperatures to operate, or aviation and shipping, that need to invest a lot of energy to move very large and heavy objects over longer distances.

03:36

And hard-to-abate sectors are one of the larger dilemmas of international climate action, because discussions around decarbonization usually go roughly like this: Well, the activist says, "Your emissions are harming the planet and threatening humanity. You need to change immediately." And the company answers, "I know. But if I invest in low-carbon technologies, and the next guy doesn't, we'll be more expensive and go out of business. It won't help the climate. So first, I need a level playing field." Both understandable positions, but bringing down emissions is kind of urgent, and a global level playing field, in which, say, all countries agree on one mutual price for carbon emissions, probably won't materialize anymore in my lifetime.

04:19

So this is where the discussions usually reach a stalemate, and where my talk would therefore end. But would it end here, I wouldn't have been invited to hold it, and I already promised you that saving the planet does not have to break the bank. So let's maybe follow the path of our lump of coal just a little further.

04:37

The last time we left it, it had helped make steel, which, climate impact notwithstanding, is one of the key building blocks of our economies. It's in many, many things, from huge structures to everyday household items like refrigerators or washing machines. We use it to build wind turbines, which we need to save emissions in the power sector, and we use it to build our cars, which is the part of the journey I'd like us to follow next.

05:03

Now, in today's typical car, steel can be found in many, many different parts. You can assume that an average European midsize sedan with a 30,000 euro price tag contains about one ton of it. To produce one ton of steel, in Europe, generates a bit less than two tons of carbon emissions. In other countries, like China, it's a bit more, so let's round to two. Now we've learned earlier that moving to low-carbon steel can increase its costs by as much as 50 percent. If history tells us anything, then these costs will likely decrease over the long run, if humans truly put their mind, their muscle, their money behind it. But, for the sake of this argument, let's stick to these costs, plus 50 percent. In the case of our European midsize sedan, this translates into ... wait for it ... 200 euros.

05:57

Wait, that can't be right. That's not even a percent of the final sales value. Well, let's do the math. If you spend 30,000 euros for a car, what are you actually paying for? Well, first of all, the car company needs to make money. So the first 20 percent are for its margin, for marketing, the whole sales organization, overhead and so on. The car needs to be assembled -- another 20 percent goes to production. First, the parts of the car have to be assembled -- 40 percent go to suppliers. In this whole process, many things need to be moved from A to B and back, so more goes to transportation. Now only 15 percent of the price of the car is actually for the materials in it. Things like the battery, aluminum, plastics, glass, and two percent for the steel. This means that materials that make up 90 percent of a car's emission footprint by the time that I can buy it in the dealership make up only 15 percent of its costs. And it means that even [though] the car company has to pay 50 percent more for the steel in the car, this only translates into a very small markup on my final sales price.

07:04

Now you would rightly argue that steel isn't the only thing creating emissions in the car. And that's, of course, correct. So we did the math for other commodities and processes as well. And it turns out building a 30,000 euro car out of exclusively carbon-neutral materials would only increase its price to 30,500 euros, only 500 euros extra. It's less than two percent more. Buying that same car in sunset red instead of black would cost me 700 euros extra. Fancier rims -- 1,000 euros extra. Leather seats -- 2,000 euros extra. You get the picture.

07:42

So let's imagine: that same discussion we had earlier, but with a car producer in the middle, where the activist says, "Your emissions are harming the planet and threatening humanity. You need to change immediately." And now a car producer answers, "I know. But if I invest in low-carbon materials, and the next guy doesn't, my car will be two percent more expensive. Wait ...

My customers might actually pay that. And I can market all my cars as carbon-neutral. Steel producer, your steel is creating too many emissions in my car. You have to change immediately." "I can make low-carbon steel for you, but it will be more expensive." "How much more expensive?" And now, we at least have a dialog.

08:24

Almost everything about the way we currently live currently contributes to global warming. Most of the things we buy come with a heavy emissions backpack that few of us are really aware of. What I want you to understand is that we can eliminate a lot of these emissions by just spending one to two percent more on things that we buy. We've learned what it would cost to produce a carbon-neutral car. So how about a carbon-neutral smartphone? Three euros extra. That's 13 cents a month on a two-year plan. A carbon-neutral pair of jeans? 60 to 70 cents extra. Even building a house out of carbon-neutral materials would only increase its costs by two to three percent, and even less in good locations.

09:07

There are six supply chains that are responsible for almost half of all global emissions that we can impact directly through our purchasing decisions. Those are things like food, construction, fashion, consumer goods, electronics and, of course, automotive. And just like in the car example, materials make up only a fraction of the final sales price in most of them. Addressing these emissions could be a huge step forward for international climate action. It would enable customer-facing companies that can benefit from marketing carbon-neutral products to address a multiple of their direct emissions footprints.

09:44

And many of these emissions are in sectors like steel, that can shoulder the costs on their own. Some are in countries that don't yet regulate emissions aggressively enough. Take the Chucks I'm wearing now. Me being willing to spend two percent more on them could have reduced the production emissions in China. Now I'm well aware that not everyone can easily afford to spend these two percent extra, but we have to be aware that the economic consequences, let alone the human ones, of not spending this money, would be far, far worse. We have to move to net zero. Fairly distributing the costs of this is one of the many challenges that we as a society will need to deal with.

10:22

I'm also not saying that this will be easy. Understanding supply-chain emissions is unbelievably cumbersome. Engaging with suppliers to address them takes a lot of effort. What we would

argue is that, for many companies, the chance to market a truly carbon-neutral product at just a one-to-two percent higher price should be well worth this effort. Just imagine: you're standing in a store, with two brands of the same product in front of you. One is carbon-neutral -- it costs two percent more. Which of these two products would you rather buy? Imagine you had the chance to work for either one of these two companies. Who would you rather work for? Imagine you were an investor. On which of these two companies would you bet your money? Which of these two do you think will be more successful in the long run? To solve the climate crisis, there's still a lot we need to figure out. There are many challenges we need to overcome. But economics don't have to be one of them.

11:28

Thank you.