

Dr. Leah Stokes (00:02):

I am Dr. Leah Stokes.

Dr. Katharine Wilkinson (00:04):

And I'm Dr. Katharine Wilkinson, and this is A Matter of Degrees.

Dr. Leah Stokes (00:11):

Today we're diving into a topic that probably doesn't come up a lot at dinner parties, but it's a super important part of addressing the climate crisis.

Dr. Katharine Wilkinson (00:21):

Without cutting pollution from this part of the economy. Hitting our climate targets is pretty much impossible, yet it's one of the areas that's been left on the back burner when it comes to decarbonization.

Dr. Leah Stokes (00:33):

I'm sure our listeners have seen those pie charts that split up pollution by sectors. You know, you've got transportation, electricity, agriculture buildings, but you can't forget that there's a whole big piece of the pie called industry.

Dr. Katharine Wilkinson (00:48):

That is what this episode is all about, the industrial piece of the pollution pie, and most importantly how we clean it up. But what exactly is industry?

Dr. Leah Stokes (00:59):

This is a big sector that is broad and complicated. So to help us unpack what's going on, I invited my friend and colleague at UC Santa Barbara, Dr. Eric Masanet, to come on the show. He is really one of the world leading experts on industrial decarbonization.

Dr. Eric Masanet (01:17):

Thanks, Leah. I am thrilled to be here.

Dr. Leah Stokes (01:20):

Eric and I are actually doing a research project on this very topic. We're looking at how to cut pollution from heavy industry and what policies can help us get there.

Dr. Katharine Wilkinson (01:30):

It's really great to have you on Eric, and I think we should start from the beginning. What exactly are we talking about when we say the industrial sector?

Dr. Eric Masanet (01:40):

The industrial sector covers the processing and production of pretty much all the physical stuff we need in our daily lives. We're talking about the materials that we literally build our society with, the cement and steel for buildings and bridges, all the goods we use every day like cars or computers, and all of the manufacturing of these materials and goods is responsible for about a quarter of all direct greenhouse gas emissions in the United States.

Dr. Katharine Wilkinson ([02:07](#)):

Alright, let's get into action. What is actually being done to clean up the industrial sector?

Rebecca Dell ([02:13](#)):

So this is a very, very diverse sector, but weirdly, a huge portion of the emissions come from just a very, very short list of activities.

Dr. Leah Stokes ([02:26](#)):

That's Rebecca Dell. She's a Senior Director of the Industry Program at Climate Works.

Rebecca Dell ([02:29](#)):

Specifically two thirds of all the emissions from the industrial sector come from just three activities, making steel, making cement, and making chemicals.

Dr. Eric Masanet ([02:41](#)):

In our daily lives these industries are hard to see, but highly present.

Rebecca Dell ([02:46](#)):

I'll give you an example from my life. I live in the state of California. There are no steel mills in the state of California. The last traditional steel mill in the state of California closed before I was born. For me and my 40 million fellow Californians, you're never gonna interact with this industry. However, it's not like there aren't any cars in California. It's not like there aren't any buildings in California. It's not like our homes aren't full of appliances and all of those things are made out of steel, and so the steel came from somewhere. We are using the steel, we are interacting with it, we are benefiting from it, but we are not encountering the process that led to its creation in the first place.

Dr. Eric Masanet ([03:30](#)):

As downstream consumers, we typically don't think about where all those materials came from or the emissions that they created. And this lack of visibility is a huge reason why we haven't seen enough action to decarbonize this sector.

Dr. Leah Stokes ([03:44](#)):

We asked Rebecca about how we could start making some progress. What were some of the buttons we could push or levers we could pull to start driving decarbonization?

Rebecca Dell ([03:54](#)):

Let me give you an example from steel. When you make steel, mostly what you're doing is making iron. The way we do that today is with coal. We use these things called blast furnaces and it's almost a ton of coal per ton of steel that is required. And what that corresponds to is about two tons of CO₂ per ton of steel.

Dr. Leah Stokes ([04:16](#)):

To put it another way, these are like CO₂ factories that also happen to make some steel. So we've gotta figure out another way to do this. There has to be some alternative.

Rebecca Dell ([04:27](#)):

Instead of using coal, we can use hydrogen, and if we use hydrogen, then the byproduct, it's not carbon dioxide, it's not CO₂, it's H₂O AKA water. So all that comes out of the stack would be water vapor.

Dr. Eric Masanet ([04:43](#)):

There are a lot of other solutions out there. For example, there's still a lot of room for improving energy efficiency in many plants and also just using materials much more efficiently. We can also think about decarbonizing with renewable forms of heat like bioenergy and you can capture a lot of the pollution before it even heads to the atmosphere. Lastly, one of my personal favorites is electrification.

Dr. Leah Stokes ([05:05](#)):

It's not just our homes or our cars that we can run on clean power and plug into the grid. We can do the same thing for big machines at these industrial facilities.

Dr. Eric Masanet ([05:16](#)):

Most of those machines, they're running on heat and that heat comes from burning fossil fuels and in a lot of factories we can electrify those processes.

Dr. Leah Stokes ([05:25](#)):

And once a factory is running on electricity, it can get even cleaner every year as the grid decarbonizes.

Dr. Eric Masanet ([05:34](#)):

But another huge reason that decarbonization is so behind schedule is just how complicated it is to make these changes.

Rebecca Dell ([05:40](#)):

When you're trying to think about decarbonizing these industries, it's not just a matter of like you've got a dirty piece of equipment and you're gonna swap out a clean piece of equipment for it.

Dr. Leah Stokes ([05:52](#)):

As Rebecca talked about, hydrogen is one potential solution to decarbonize steel plants, but it's never that simple.

Rebecca Dell ([06:00](#)):

When you swap out a coal furnace and swap in a hydrogen furnace, well now you don't need coal anymore. Instead you need hydrogen and you need a lot of it. And there's a very good chance that the whole reason that the steel mill was built in the place that it was built was because it was close to a coal mine. So is this steel mill going to have access to sufficient amounts of clean electricity? If you were going to fully electrify it and use a hydrogen steel making process, we would be talking about maybe three gigawatts of clean electricity that one steel mill would require to operate. To give your audience a sense of scale, a typical nuclear power station is one gigawatt. So we're talking about three nuclear power stations to run one steel mill.

Dr. Eric Masanet ([06:49](#)):

When we talk about industrial decarbonization, we're not talking about building out solar panels or buying a new EV. This is a huge interconnected system that has been operating this way for more than a century.

Dr. Leah Stokes (07:01):

In other words, the momentum is working against us. We are researching where and how we can electrify factories in the United States, but there's one other solution that we're also looking at.

Dr. Eric Masanet (07:15):

That's right, and it's geothermal. Geothermal heat is heat that occurs naturally underground. We need to drill down into the earth in order to access it, but once we do that, we can route it directly into a factory to use it as heat and doing that replaces fossil fuels.

Dr. Leah Stokes (07:32):

So geothermal is yet another one in our set of solutions. We've got efficiency, electrification, hydrogen, carbon capture, solar, thermal, biomass and geothermal. It's a long list, but how can we put these solutions into action given the complexity of these plants?

Dr. Eric Masanet (07:51):

One of the places we're really seeing movement is at companies that are downstream within the industrial sector. These are the companies buying the chemicals, the steel, the aluminum, and turning it into the products that we see as consumers. So we wanted to hear about how these industrial decarbonization efforts have gone about making the supply chain work.

Nick Santero (08:10):

So making a car is both complicated and simple at the, at the same time.

Dr. Eric Masanet (08:16):

That's Nick Santero. He leads the sustainability science team at Rivian, which makes all electric trucks and SUVs. We know that getting electric vehicles on the road is key to decarbonizing the transportation sector, but Nick's job is to minimize the impact of manufacturing those cars too.

Nick Santero (08:33):

Fundamentally, the materials that go in are not so exotic. We've got steel, we've got aluminum, we've got plastics, we have components in the battery. We're shaping these, these materials into parts and we're fitting these parts together. We see nuts, bolts, adhesives. There's a paint shop, so ultimately it's something that looks a lot like a hot wheel.

Dr. Eric Masanet (08:53):

But making one of these vehicles is anything but child's play. Nick told us what it looks like inside Rivian's manufacturing facility.

Nick Santero (09:01):

Our factory in Normal, Illinois is about 70 football fields large. So to put that in context, that's all the NFL teams playing at once, and it's not the biggest factory by far.

Dr. Eric Masanet (09:12):

70 football fields of machines, parts, workers and car building robots.

Nick Santero (09:17):

Anybody that's watched an automotive plant operate, they describe it as a dance. The coordination it takes to get just one part from a sheet of steel all the way to the final assembly line is a maze. From the outside looking in it's magic, frankly.

Dr. Eric Masanet ([09:33](#)):

It's deeply complex, which means decarbonizing all those steps is complex too, but it also means that there are hundreds of ways, however small to cut pollution from car making.

Dr. Katharine Wilkinson ([09:45](#)):

But with so many materials and processes and parts, where do we start? Where is most of the pollution coming from?

Dr. Eric Masanet ([09:53](#)):

Nick broke down how much carbon gets emitted over the lifespan of an electric car.

Nick Santero ([09:57](#)):

Roughly about half of that carbon is emitted before that vehicle leaves the factory, most of that is from the conventional material supply. Think your steel, your aluminum, your plastics. The other half occurs after it leaves the factory for an EV and that's the electricity that you use to charge your vehicle. Uh, of course you can choose the types of electricity that you have and use renewable energy, but this idea of this half and half is a good rule of thumb to think about decarbonization, half of it is on making the vehicle, the other half is on using the vehicle.

Dr. Katharine Wilkinson ([10:29](#)):

Once we get our power grid to run on 100% clean sources, the carbon footprint of driving electric cars will basically disappear. But if we ignore how those cars are made, we're leaving half of that pollution on the table.

Dr. Eric Masanet ([10:45](#)):

We can't get to net zero without decarbonizing the industrial sector. And Rivian is one of the companies leading the way. Since they first shipped their cars back in 2021, they've reduced their carbon footprint per vehicle by around 15%.

Nick Santero ([10:59](#)):

And that's because we've tackled some really important and low hanging fruit. Things like recycled content, focusing on our supply chains of steel and aluminum as well as polymers and saying, what can we do about this? How do we work with our suppliers to get better materials, less impactful materials into our vehicles?

Dr. Eric Masanet ([11:13](#)):

Like Nick said, pollution from manufacturing doesn't just come from inside the factory. A lot of it is embodied in the products they use like steel parts and they don't make the steel parts themselves. So they work with their suppliers to reduce the impact of the steel parts they're sending to Rivian.

Nick Santero ([11:30](#)):

We need to signal to our supply chain partners that we do care about this. If we don't ask the questions and we don't create the requirements for them to hit particular carbon goals or other sustainability goals, then there's no incentive for them to do it.

Dr. Eric Masanet ([11:43](#)):

And this keeps going down the supply chain. To hit a carbon goal that Rivian gives them, that steel parts supplier might need to ask for cleaner raw materials from one of their suppliers and it goes on from there.

Dr. Katharine Wilkinson ([11:55](#)):

Kind of a decarbonization ripple effect. I'm glad we have climate minded companies who are leading the way, but here's the thing, just about every product out there claims to be sustainable these days.

Dr. Eric Masanet ([12:09](#)):

Lots of companies will say they're green, but it can be really difficult to know whether those claims translate into meaningful emissions reductions.

Dr. Katharine Wilkinson ([12:16](#)):

We call this greenwashing.

Nick Santero ([12:20](#)):

Greenwashing often comes from a lack of transparency or maybe even selective transparency, what you choose to talk about and the things you don't choose to talk about. One of the ways that Rivian, as well as a lot of other companies, have gone to push against greenwashing is by providing scientific grounding for the work that they're doing. It's not to say that they're doing good or bad, it just is.

Dr. Eric Masanet ([12:43](#)):

And when companies are doing a good job with transparency, it improves the ability of consumers to understand what they're buying.

Nick Santero ([12:50](#)):

Policies change, market forces change, external partnerships change. There's a lot of things that an organization potentially can't control, but we can always control what we're being transparent about.

Dr. Eric Masanet ([13:01](#)):

Transparency won't clean up the industrial sector all on its own, but it is a critical first step, both because it holds companies accountable and because it gives consumers agency to shift demand to companies that are making meaningful progress towards the goals that they value.

Dr. Katharine Wilkinson ([13:17](#)):

But a sustainable transparent process can still come with difficult decisions. Making a product greener isn't always clear cut.

Nick Santero ([13:27](#)):

There was a project that I was working on long ago and we were designing a piece of metal and eventually I realized that you can make this metal a little bit greener by taking out some of the aluminum and replacing it with steel. And so you've merged these two metals together.

Dr. Katharine Wilkinson ([13:43](#)):

Sounds perfect, right? A neat, tidy technical solution to make a cleaner product.

Nick Santero ([13:48](#)):

Unfortunately, what that does is it makes it really difficult to recycle. So we came upon this very difficult paradox where we could reduce the carbon footprint significantly and we make it a lighter, better product, but we couldn't recycle it. And which one of those was better? Ultimately, it came down to value choices. There's no formula that says carbon footprint is more important than recyclability.

Dr. Katharine Wilkinson ([14:15](#)):

There are no easy answers here. We'll need to grapple with these value choices more and more as we clean up the industrial sector.

Dr. Eric Masanet ([14:23](#)):

And at the end of the day, the product has to work the way people expect it to and people have to buy it.

Nick Santero ([14:31](#)):

Is it cost competitive? Am I gonna see a return on that investment? Does it functionally work? How are customers gonna feel about this? Is it something they want to experience? Is it gonna last as long? These are all real challenges that we have. We can't just make something greener and have it be lower carbon. That's not enough. It also needs to be an amazing product that people want to use or else you've created something that has a low impact, but it doesn't have any use case.

Dr. Katharine Wilkinson ([14:59](#)):

If people decide to buy a dirty product over a clean one, then we're back to square one. And figuring out how to make things cleaner could become even more important because of some creative policies in our old friend the Inflation Reduction Act. Leah, are you still out there?

Dr. Leah Stokes ([15:19](#)):

Did someone say Inflation reduction Act <laugh>? Yes, Katharine, this is very important. The biggest part of the IRA are two tax credits that give incentives for building and producing clean energy like solar and wind.

Dr. Katharine Wilkinson ([15:33](#)):

Okay, let's take a step back, Dr. Stokes, what does building solar farms and wind turbines have to do with heavy industry and its pollution?

Dr. Leah Stokes ([15:41](#)):

Well, to get into the weeds for a second, the clean energy tax credits have these domestic content bonuses, which basically means that if you build your clean energy project with stuff that's made in the US, you get extra money, your incentive goes up by 10%.

Dr. Katharine Wilkinson ([15:56](#)):

That's pretty sweet. And it would encourage, I assume, developers to purchase materials like steel, iron, other manufactured products right here in the US rather than shipping them in from overseas.

Dr. Leah Stokes (16:08):

Exactly. And that would mean that there was more demand for domestically produced materials like steel.

Dr. Katharine Wilkinson (16:16):

Which would mean more factories to make them. And I get that these are meant to be new clean projects, but they still might raise some concerns for nearby communities, right? Given that in the past these industrial plants, well, they haven't always been the best neighbors.

Yinka Bode-George (16:33):

In Maryland near where I grew up, uh, there was a concrete plant. The process of transporting these concrete materials can create immense amount of air pollution and noise pollution for the communities who live nearby.

Dr. Leah Stokes (16:48):

That's Yinka Bode-George. She's the founder and CEO of Sustain Our Futures Foundation. She consults with companies who are looking to decarbonize their businesses and protect communities.

Yinka Bode-George (16:58):

So in Maryland, this concrete plant actually exists nearby the Kingdom Missionary Baptist Church, which was a historically Black church in the community. So church members could actually sweep up the particulate dust created from this facility and actually fill a sizable jar with that dust. Can you imagine what it's like to breathe in all of that particulate matter and dust every single day going to church?

Dr. Leah Stokes (17:28):

And we know that breathing in this dust or particulate matter as it's often called, can increase the risk of health problems like heart disease and asthma. And there are other toxic pollutants emitted by some of these facilities that are linked to higher cancer rates in nearby communities.

Yinka Bode-George (17:45):

So for example, in the south side of Chicago, community advocates fought against a proposed recycling plant because it included a metal shredder machinery that's actually known to cause very hazardous particulate matter. And so advocates really didn't want this coming into their community and they successfully disrupted the permitting of this facility.

Dr. Katharine Wilkinson (18:07):

Sometimes we assume that a project with sustainability goals will benefit everyone, but that is certainly not always the case.

Yinka Bode-George (18:15):

The relationship between industry and the neighboring community stakeholders has been a legacy of harm, extraction, exploitation. Heavily polluting industries tend to be cited in an overrepresented manner in majority Black, Brown, and low-income communities.

Dr. Katharine Wilkinson (18:33):

People should not have to breathe toxic air just because their neighbor is an industrial plant. And even if a facility is installing these new technologies to reduce harmful pollutants, there's still that legacy and the potential for harm. And that doesn't just go away.

Dr. Leah Stokes ([18:50](#)):

We don't wanna keep repeating past mistakes. So how can companies do better?

Yinka Bode-George ([18:57](#)):

The same behaviors that created the climate crisis, those behaviors of sacrificing people and sacrificing the planet, are not gonna get us out. We have to champion new and different ways of being. For companies, healing their relationship with communities looks like showing up differently.

Dr. Katharine Wilkinson ([19:19](#)):

We asked Yinka, what does showing up differently really look like?

Yinka Bode-George ([19:24](#)):

Just stepping into a community, that's a huge responsibility. So companies should start with their own due diligence. What has been the legacy of harm in this community and how can I as a company not recreate that harm? Engaging community stakeholders meaningfully is key.

Dr. Leah Stokes ([19:40](#)):

We can't expect everybody to understand the ins and outs of how steel is made, but it's still important to educate local communities on the potential harms and benefits of, say for example, replacing a blast furnace with hydrogen.

Dr. Katharine Wilkinson ([19:54](#)):

So why is it that companies don't typically engage local communities? What is the holdup?

Yinka Bode-George ([20:00](#)):

I think a lot of companies tend to be afraid of engaging community stakeholders because they face opposition, but that opposition is rooted in behaviors of harm and exploitation. So when you're using behaviors that are more generative, that are more equitable and fair, community stakeholders can be so critical in realizing successful outcomes for your project.

Dr. Leah Stokes ([20:24](#)):

Yinka shared an example of how this works in practice. When a large electric bus manufacturer was building a new facility, they partnered with a labor coalition to make sure there were real community benefits from the project.

Yinka Bode-George ([20:38](#)):

This includes things like pre-apprenticeship programs, making sure that new hires and those who are promoted are from historically excluded groups in the community.

Dr. Katharine Wilkinson ([20:49](#)):

We do love to hear about more electric buses and of course, how clean technology manufacturing creates good jobs.

Dr. Leah Stokes (20:56):

But as Yinka explained, it's not just about creating jobs. Companies should also make sure that nearby communities are not exposed to harmful pollution.

Yinka Bode-George (21:06):

It's not enough to say, we hope that this combustion process doesn't create additional air pollution for the community. Or research says it's not going to do that. You have to have safeguards.

Dr. Katharine Wilkinson (21:19):

And safeguards could look like pollution monitoring and reporting. It could look like data that's accessible to the public. And of course mitigation strategies if pollution exceeds those limits. Industrial facilities need to commit to being better neighbors.

Dr. Leah Stokes (21:35):

And this isn't just good for the communities. It could also be good for the business, including their bottom line.

Yinka Bode-George (21:42):

What we see now is a lot of communities opposing these infrastructure projects. So when companies seek permitting for a new project, they get shot down because community members don't wanna live near them. That opposition is rooted in that legacy of harm and exploitation. And so if the moral argument is not quite there for you as a company, really think about the cost of an action. There are notable stories like the Osage Nation opposing the wind farm and having to face hundreds of millions of dollars in termination fees.

Dr. Katharine Wilkinson (22:21):

To transition to a clean economy. We need to build a lot of new infrastructure. Facilities that can make clean steel, put together wind turbines, generate clean energy, and we need to do that quickly if we're gonna meet the targets we have for a livable future. And that's gotta be way faster than we are now.

Yinka Bode-George (22:41):

It's not just the right thing to do in terms of centering community-based approaches. It's also critical to deploy fast enough, critical to meet our massive sustainability goals.

Dr. Leah Stokes (22:53):

Recent federal climate policies have recognized how important it is to bring communities along. You know, the Bipartisan Infrastructure Law and the Inflation Reduction Act. They both included stipulations to create community benefits plans.

Yinka Bode-George (23:07):

By mandating community benefit plans as part of these funds, it then required companies to create local community benefit strategies.

Dr. Leah Stokes (23:18):

Though unfortunately, these historic climate bills and especially the pieces that address environmental justice, they're in jeopardy with the new administration that is really threatening to roll back so much funding.

Yinka Bode-George (23:29):

We know that the administration has perceptions on terms like environmental justice, and it's unfortunate that those negative perceptions exist.

Dr. Leah Stokes (23:42):

Clean air and clean water for every American should not be controversial and it shouldn't be something that we have to compromise on to hit our climate targets.

Yinka Bode-George (23:51):

In the coming administration, we don't really know quite what to expect. What I think is the private sector's role in shaping sustainable futures that center equity and environmental justice will grow and grow.

Dr. Katharine Wilkinson (24:07):

The reality is that for the next four years, the private sector alongside municipalities and states, they're going to have to lead on decarbonization because we don't have time to stand still or go backwards. We all have agency to shape our communities. And getting involved in local community organizations is a great way to build that sense of agency and really make a meaningful impact on a local scale.

Yinka Bode-George (24:32):

I think one of the main assumptions of environmental justice is that it's only for a small group of people. And the reality is environmental justice is really about power. What environmental justice demands is regardless of who you are, the color of your skin, where you live, your education level, your age, regardless of all of those factors, you can access everything conducive to your wellness. And so what that looks like in the world of industrial decarbonization is centering those who have been most significantly relegated into positions of marginalization.

Dr. Leah Stokes (25:15):

Yinka left us with a positive vision of the future, one where we're able to deploy new industrial technologies at a massive scale, but we do it right this time.

Yinka Bode-George (25:26):

This future looks like people being able to breathe clean air, people having high quality jobs, people not being left behind. How we got to the climate crisis is not how we get out of it. And so a deep interrogation of the practices that led to the climate crisis is so necessary so that we are making sure we're putting forward those root cause solutions to address things.

Dr. Leah Stokes (25:59):

Now is the time to really push things forward to make that future real.

Dr. Eric Masanet (26:09):

One way we can tell the story is that it's just too hard, it's too costly, it's too complicated. But I don't think that's the right story here. And neither does Rebecca.

Rebecca Dell ([26:18](#)):

A lot of people say what you're doing is so hard. And I don't actually think that it's hard. I think that it's just early stage. So I often tell people that the state of the work for industrial decarbonization is similar to the state of the work for clean and renewable electricity in the year 2000. Imagine going back to the year 2000 and you were out there saying, we think we should have a hundred percent clean grid. People would probably be like, that's crazy. That's gonna upend the whole economy. That's gonna cost a squillion dollars. Like it wouldn't even work, the lights would go out. What are you talking about? But fast forward more than 20 years, and we're in a situation today where a hundred percent clean grid is not easy. It's not inevitable, but you look around and you're like, we have line of sight for how this could work.

Dr. Leah Stokes ([27:17](#)):

Getting to the point where we could see the solution just around the corner. It took years of work. Regulation, policy, organizing, you name it. But now we can finally see a pathway to decarbonize the industrial sector.

Dr. Eric Masanet ([27:32](#)):

And as Rebecca said, that's the work that needs to be done now. It's not impossible, it's just that some of it is early stage.

Dr. Leah Stokes ([27:40](#)):

And when things are early stage, well that can be exciting.

Rebecca Dell ([27:44](#)):

Every additional piece of work that we do in it has higher leverage than it will at a later stage. So this is an opportunity to get into a fantastic project on the ground floor.

Dr. Leah Stokes ([27:54](#)):

And what we've got to do is get companies to change how they're thinking. And there's a reason that that can be hard to do.

Rebecca Dell ([28:00](#)):

Change costs money even if it's good change. Change costs money.

Dr. Leah Stokes ([28:15](#)):

These companies like any other, are profit driven. So how can we convince them to make the change when it costs them money?

Rebecca Dell ([28:15](#)):

So these basic industries that provide kind of the fundamental materials of our economy, the cost of the materials is a vanishingly small percentage of the cost of the finished product. For construction in the United States, less than one half of 1% is the typical amount of money that we spend on cement. Just because the clean cement is more expensive doesn't mean the building is more expensive. If you look at it from the perspective of somebody who owns a cement kiln and you're like, okay, it might be more

expensive for you, but it's not gonna be more expensive for the economy at large. That's a policy problem. That's not a question of can we afford it. Absolutely we can afford it.

Dr. Eric Masanet ([29:00](#)):

That's true. In many cases, industrial decarbonization investments come with lots of co-benefits that translate into reduced production costs. For example, when we eliminate onsite combustion through electrifying a process, that same company also eliminates onsite pollution abatement equipment. And that translates into benefits to the bottom line.

Dr. Leah Stokes ([29:21](#)):

Which means that decarbonization doesn't have to make things more expensive.

Rebecca Dell ([29:25](#)):

When I meet with representatives of incumbent firms who are interested in taking climate action, they know that they need to. Like in the fullness of time, and the fullness of time is not that much time, now it's like 25 years, they are going to have to transition. And so right now they're in a position where they say, look, current market conditions will not support the cost of transition. And so we're just gonna fight efforts to make us transition because we think we'll lose money. And I say to them, no, the solution here is not for you to fight efforts to transition. The solution here is for us to work together to change the market conditions. You know, you need to change. We know you need to change. We know that you can't afford to change under current circumstances. So work with us. We all understand that the most important thing here is that we need to create a set of circumstances where when a customer goes to the market and they are offered a clean version or a dirty version, they will decide, I prefer the clean version. Let's work together to change market conditions.

Dr. Leah Stokes ([30:40](#)):

Market conditions are just another term for policy, and we need that policy to coordinate so that companies up and down the supply chain act, and they're not holding back an industry just because there's a slow mover.

Dr. Eric Masanet ([30:54](#)):

And we need policies that create market demand for these clean products. And consumers need to know when it's really a clean product. We can do this through third party verification so that people can tell if it's real or if it's greenwashing.

Dr. Leah Stokes ([31:07](#)):

So we know what we need to do. But the question is how can we get policies in place to move the market and help push these companies along?

Dr. Eric Masanet ([31:15](#)):

Well, there's a lot of common ground here and room for action at both the federal and state levels.

Rebecca Dell ([31:21](#)):

While the Republican party does not have a longstanding commitment to climate action, they are extremely interested in the competitiveness of American manufacturing, in innovation for American industries, in making sure that American industries are at the technological cutting edge.

Dr. Leah Stokes (31:42):

And there are specific policies that we can push for. Rebecca had some ideas.

Rebecca Dell (31:49):

The most important thing that anybody can do is to get involved as a citizen first and a consumer second, you have much more power as a citizen than you have as a consumer. A great example of something that we need to be pushing at the state level is a set of policies called Buy Clean. Buy Clean is the idea that your government is buying some of the most emissions intensive materials out there, specifically building materials. And if they're gonna be using your tax dollars on it, they should be buying the green versions. You can go to your city government and say, hey, you guys, you're building all these roads. Are you building them out of clean concrete?

Dr. Leah Stokes (32:31):

The work to decarbonize our industrial sector is extremely complicated. And as Rebecca said, it's early stage.

Dr. Eric Masanet (32:38):

But the solutions are there. We can set up policies that change market conditions. We can buy clean to provide strong incentives for companies to decarbonize, and we can work with these industrial companies and figure out together what they need to do to make this transition happen.

Dr. Leah Stokes (32:53):

And that involves two things. First, adopting those proven technologies that are available today like electrification. And second, making those investments so that we have the technologies we need tomorrow.

Dr. Eric Masanet (33:12):

As we heard from our guests today, the private sector is really going to have to play a huge role here. The good news is that there are plenty of companies, innovators, and leaders out there who get that this is no time to hit the brakes on decarbonization. And I'd like to stress that it's definitely possible for the industrial sector to reach net zero emissions by mid-century. First of all, we've got a lot of the technologies we need already in hand today. And with the right planning, commitments, and investments, we can make progress on the new technologies that we need to get them out the door.

Dr. Katharine Wilkinson (33:44):

And we can focus on building strong, diverse coalitions, bringing together labor groups, environmental advocates, public health professionals, clean tech innovators. It's about creating a shared vision for industries that are clean, that provide good jobs, that protect people's health and make communities better.

Dr. Leah Stokes (34:09):

A Matter of Degrees is co-hosted by me, Dr. Leah Stokes.

Dr. Katharine Wilkinson (34:12):

And me, Dr. Katharine Wilkinson.

Dr. Leah Stokes (34:16):

We are a production made in partnership with FRQNCY Media, the 2035 Initiative at UC Santa Barbara, and The All We Can Save Project.

Dr. Katharine Wilkinson ([34:25](#)):

Thanks to our funders and supporters who make this show possible, including the 11th Hour Project. Special thanks to Fossil Free Media and the Make Polluters Pay Campaign, which is working to hold big oil accountable for the damage they're doing to our climate and our communities. Find out more at makepolluterspay.net.

Dr. Leah Stokes ([34:43](#)):

And if you're digging the show, please hop on Apple Podcasts or Spotify and give us a five star rating or leave us a review.

Dr. Katharine Wilkinson ([34:49](#)):

Script writing, fact checking, communication and production support are by Lucas Boyd, Quinn Lewis, Christin Palmstrom, Anusha Singh, and Eleanor Thomas.

Dr. Leah Stokes ([35:00](#)):

At FRQNCY Media, Michelle Khouri is our executive producer. Lizzie Stewart is our producer and Claire Bidigare-Curtis is our editor and sound designer.

Dr. Katharine Wilkinson ([35:10](#)):

Rose Wong designed our show art. Sean Marquand composed our theme song and additional music came from Blue Dot Sessions.

Dr. Leah Stokes ([35:17](#)):

Find us online at degreespod.com and [@degreespod](#) on the artist formally known as Twitter, and you can also find us on YouTube.

Dr. Katharine Wilkinson ([35:26](#)):

And stay tuned for more stories for the climate curious.

Dr. Leah Stokes ([35:36](#)):

Everyone's invited and it's going to be a party, an industrial decarbonization party. <laugh>.

Dr. Katharine Wilkinson ([35:44](#)):

<laugh> Serve up the pie now baby <laugh>.

Dr. Leah Stokes ([35:52](#)):

That was a good laugh.