The Climate Show

This podcast features leading experts' insights on current climate change research.

Episode 6. Tristan Smith: Maritime transport GHG emissions

Transcript

00:00:04 Speaker 1

Hi and welcome to the Climate Show, a podcast that explores the law and politics of climate change.

00:00:09 Speaker 1

This podcast is brought to you by the University of Copenhagen.

00:00:16 Speaker 3

Hi, we are Beatriz Martinez and Linnea Nordlander.

00:00:19 Speaker 2

Alessandro Monti and we are your hosts at the climate show.

00:00:26 Bea

In today's episode we are discussing the regulation of greenhouse gas emissions from International Maritime transport.

00:00:32 Linnea

Since shipping happens out of sight, it's something that often gets overlooked and it can be difficult to raise awareness about its climate and environmental impacts. Aside from very visible things like oil spills.

00:00:43 Alessandro

And yet emissions from this sector accounts for as much as the emissions of Germany. But the legal framework is still lacking behind in regulating this very important issue and in a shipping nation like Denmark, legal developments will definitely be relevant.

00:00:58 Bea

At our Research Center, we have a team of legal scholars, myself included working on the climate impacts of maritime transport emissions with some of our research supported by the Carlsberg Foundation this is done through the project InterAct which stands for international law making actors in shipping and climate change. We look into the legal aspects of market based measures for international

shipping and the regulation of marten transport in the Arctic. And in order to better understand the science law interface in this area, we have invited doctor Tristan Smith to talk to us about how to address the contribution of shipping to climate change.

Doctor Tristan Smith is a leading expert on maritime transport, greenhouse gas emissions and the sectors energy transition. He is a leader in energy and shipping at the Bartlett School of Environment, Energy and Resources at the University College London Energy Institute. Doctor Smith has a background on naval engineering and leads the interdisciplinary UCL shipping them working in low carbon shipping. In addition, since 2014, Doctor Smith is a director of humans, a consultancy working in partnership with UCL on my time and shipping projects. Besides his academic contribution, Doctor Smith has been carrying out key research on his field for the UK Department of Transport, the International Maritime Organization, the European Commission shipping companies, charters and financiers, among others. He is the leading author of the 3rd and 4th IMO Greenhouse gas emissions report.

00:02:27 Alessandro Monti

Hop on board and enjoy the show.

00:02:39 Beatriz

Tristan, welcome to the climate show. Thank you for making timing your trip to Copenhagen to meet with us. What brings you to Copenhagen?

00:02:45 Speaker 5

Well, thank you very much for having me here and what brings me to Copenhagen. Well, I think we all know that Denmark in Copenhagen is the center of the maritime universe. And the University of Copenhagen's Center for International Law is the Center of climate change thinking you've been personally thinking about this for longer than this global Maritime Forum existed from before the Masks Center on 0 Carbon Shipping was even a a Clinton. Mr Mueller. So why would I not come and see the guru and find out what you're currently thinking?

00:03:21 Speaker 3

Thank you, that was very generous. You know, we cast a pretty wide net here at the climate show. So for our listeners, my first question is what is the contribution of shipping to climate change and why has it become so important to address shipping emissions?

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So shipping when you add it up as an international sector is somewhere between 2 and 3% of total anthropogenic emissions. It's equivalent to a country the size of Germany or Japan, but because of the way that the Paris Agreement is formed, it's it's obviously an accountancy outside of national borders. And the NDC framework that was adopted there now historically that's led the MO just like in aviation, the KO taking some responsibility for how to manage its decarbonization and. Clearly, since that was first mooted in the Kyoto Protocol, it's done an appalling job, and given that we still have a giga ton of emissions coming from the sector that are rising and continue to rise under current expected policy, so it's a critical sector that we need to decarbonize or we will fail, but there's also the enabler of global trade and it's the backbone of how we live in our current style.

So if we don't succeed in transitioning it away from its use of fossil fuel, we will end up with a sector that is massively disrupted and damages our ability to to live. And also for countries to have economic develop when we talk about shipping, we often think that shipping is our hard to decarbonize sector.

00:04:52 Beatriz Martinez

How much of that is true from a technology perspective?

00:04:56 Speaker 5

I'm an engineer by background, that was what I did. My original education and initial career in, but it it was an early realization that this is really not an engineering problem, but a societal or legal and economic problem or a commercial problem rather. That led me to move my career into a completely different area, which is the interdisciplinary or the multidisciplinary research of how do we decarbonize the sector? The technology solutions are mature. In terms of we already know how to produce hydrogen, we know how to produce ammonia, we've been doing it for 100 years. So when we need To transition the vessels to a new liquid fuel. We know how to make the feedstocks. What we don't know is how to make them. Scale in a 0 emissions way. But we have technologies to do that already.

Renewable electricity and its abundance and rapidly accelerating production but also electrolyzers for converting that energy into hydrogen and then using that hydrogen to do various different things that are more efficient for storage. So all of that is in existence and is massively scaling up as we see. Like the technology on board the ship to consume that fuel is relatively mature as well. We've already carried and transported ammonia at nearly 15 million tons per annum, so we know how to store it. We know how to transfer it from a land tank onto a ship. We know the handling and the safety operations for all of that.

What we don't have is a mature machinery technology, but just to reassure anyone who thinks this is all a bit far fetched in Belgium during World War Two when they ran out of oil, they started to run buses on pneumonia. And converted very conventional historical technology to adopt new technology. The main thing about ships engines is they're incredibly robust, and they're actually some of the most robust internal combustions in the world, you could run them on potato peelings or shredded car tires if you really needed to, so that's not the challenge.

The challenge is, how do we actually make it impossible for people not to do that because? We know that those solutions are higher cost if you synthesize a fuel and use that liquid fuel ownership, it will cost more than if we just make a hole in the ground and pump some oil out of it and that higher cost means until there is a regulatory pressure or an alternative equivalent pressure. No one will invest in the solutions that we need to have and we need to have them incredibly rapidly if we're to stay anywhere below 1.5 degrees

00:07:31 Beatriz Martinez

You have mentioned the the commercial aspects in this conundrum. You've been working closely with the shipping industry in the last years. What do you see as the main barriers or challenges faced by them in the transition to a low to 0 carbon shipping future?

00:07:47 Tristan Smith

I mean the the obvious barrier is that is the lack of a regulatory solution that internalizes the negative externality. So the classic economist answer that. Well, what we have here is a global Commons problem and and and there's a CO2 and greenhouse gas emission. In consequence of operating shipping, which they don't pay the cost of and we just need to internalize that so one barrier is kind of just an absence of regulation or absence of sufficient regulation.

Perhaps the other barrier is that the sector currently is not seeing its longer term risks and opportunities as rationally as it might, and the explanation for that ships when they're built typically operate for 2 1/2, three decades, and that means that anyone ordering a ship today is ordering a vessel, which will hopefully still be in service in the twenty 40s. Now, if you want to have any sort of decarbonization of the sector in line with 1.5 or even well below 2, we know already that the vessels operating even in the twenty 30s, will nearly all need to be.

Certainly the newbuilds will need to be 0 emissions and the existing fleet will need to be rapidly retrofitting or being scrapped 'cause it's technologically obsolete. So that means that anyone who's ordering a ship today should really be valuing that future risk. Should really be exploiting the opportunity to be a front runner and gaining market share, but we don't see that happening with very small numbers of exceptions, including Danish companies who happen to be frontrunners in ordering methanol fueled ships, which is 1 pathway to the future. So so it's really interesting 'cause we're right on the cusp of seeing the commercial case, you know we're before pre regulation, but there are companies that are starting to find ways to make capital move in the right direction.

00:09:39 Beatriz Martinez

And in this regulatory framework and skin in your 4th and more greenhouse gas emissions study, it was found that domestic shipping accounts for a greater share of greenhouse gas emissions that was previously estimated. This seems to be a good reason for States and regional actors such as the European Union to move ahead and regulate the sector, but how do you think they can best act on this?

00:10:03 Tristan Smith

Yeah, so it's it's really difficult to generalize anything about shipping. For most people it might be most of the commercial sector they might think of vessels crossing oceans, but obviously there are hundreds and thousands of small vessels which are doing a fishing excursion in a developing country or moving passengers to an island and so It's it's often been a bit of a shortcoming that we think of the solution at the MO. When the MO responsibilities really international shipping for vessels that are that are undertaking voyages between two countries and there's that whole portion of the sector that still needs to decarbonize now most of the legislation nationally has typically flown from the IMO back to domestic jurisdiction implementation so that means that many countries have just been waiting for the IMO to impose the solution on the international fleet that they can then flow through. But actually I think there's some very good arguments to do it the other way around. So one is we now have many countries with very progressive NDC's and obviously domestic shipping falls within those NDC.

So if they wait and the IMO doesn't come up with the goods in time as one would would draw a logical conclusion. At this point in 2022.

00:11:26 Speaker 5

They are going to need.

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They're going to be exposed on their domestic fleets.

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They'll be behind their otherwise good intentions and their domestic sector will start to become a real problem as all the other sectors decarbonize. So countries like Denmark. Which isn't massive for domestic shipping, but it will will need to solve that problem. Countries like the US have a much bigger domestic fleet, a much larger emission, and currently very little to enable the transition of that sector. So there's a clear headache which we can identify. Now they're going to have to solve, they might as well get on with it, but the other thing is a very interesting part of the kind of innovation opportunity. Or industrial strategy opportunity that arises when you think of this as a transition that you start in the domestic fleet and the innovation niches that occur on vessels that were operating on perhaps shorter routes within your national jurisdiction that it's easier for you to subsidize and create incentives for.

At this point in time whilst we wait for the IMO to instill the regulation it desperately needs. So we have the transition starting there, but it's a lower risk transition because you're building your assets as smaller vessels. The infrastructure investments are smaller you can. You can do industrial ecology and Co-locate your early experiments on hydrogen with your other national opportunities to do hydrogen, either as production or or as demand. So there are all sorts of reasons why. Uhm, I think the domestic opportunity is under exploited as an opportunity and I think over the course of this decade, we'll really see that take off and one of the initiatives launched at COP 26 around green corridors. The Clydebank

Declaration is a great example of that. It's it's proactive domestic or regional action. Come as an encouragement as a positive step towards us. Ultimately having IMO regulation in addition.

00:13:15 Speaker 3

And in connection with the with the more there seems to be a momentum for the establishment of a market based mechanism. You recently published a paper with Ian Parry and others called a carbon levy for International Maritime. When you discuss this, could you tell us what the states are? We add in the negotiations, which of course you follow very closely. What are the key elements and which should be avoided in this connection? And further, is there any alternative to carbon pricing?

00:13:43 Speaker 5

Yeah, so let's see if I can start at the end. I'll then work backwards. So there is there is an alternative to carbon pricing, it's command and control. We could mandate that vessels, either domestically or internationally, operate with a certain fuel, carbon specification or greenhouse gas emission specification and then ratchet that mandate down over time and that sort of fuel standard legislation being used in California, for example, it's being mooted by the European Commission and Union in Europe to address its fit for 55 package. So so fuel standards are certainly a well known tool where there's a straightforward technology challenge.

00:14:22 Speaker 5

But one of the difficulties with fuel standards is they require. They either require a lot of complexity in their design to allow flexibility, or they mandate every vessel or every operator to comply with the same pathway. The same technology transition, and actually this is a transition where there will be ships or owners or routes that have the opportunity to move faster sooner and that's what we really need to be doing this decade. We need to be seeing early adoption of the long run solutions. The hydrogen derived fuels ammonia. Now, not a series of incremental changes that first bring in some LNG assets, then do a bit of bio fuel and then make both of those obsolete in about 5 or 10 years time as we ultimately get to the ammonia solution we need to do the end game in a small volume of ships now and then. We need to use that to lower technology costs and to build up infrastructure and supply chains and get that rolling out as rapidly as possible, we think in our estimates and our modeling, we need about $400 billion to be unlocked by 2030 on those hydrogen derived supply chains. And at that point in time, any capital that's sitting in biofuels or liquid natural gas will become incredibly risky. So the more we can design policy that enables that enables the kind twin track approach of early adopters incentivized, but also you know getting everyone more efficient getting revenue flowing from the better and we're seeing a good recognition of everything i've just said in the positions of most of the Member States at the IMO.

It's a really, you know, it's a really encouraging sign roster which we can say on one hand. IMO doesn't have legislation that it desperately needs the level of kind of understanding of the transition that's needed, and the and that's all clearly recommended in recognize sorry in the in the submissions that I can read. So a mix of emerging economies, small island developing states, developed economies,

shipowners associations are all pointing towards carbon pricing with some sort of rebate mechanism, which means a policy design which automatically allocates some of the revenue from carbon pricing to those who are who are frontrunners early adopters.

So carbon pricing in a feedback mechanism and some sort of fund that you can use more creatively, and that's where the kind of equity issue that we might talk about next comes in. But that sort of architecture is now widely recognized and supported. Interestingly, the country that is most ambiguous on that, all the countries are European and we need to really hear what they are going to say at the next IMO meetings because they will be critical in helping us understand how this is going to unfold in the next year, how painful it's going to be to get to a conclusion.

00:17:19 Beatriz Martinez

As you know, something that we are interested in here, the faculty is shipping in the Arctic. As the regulations are very advanced. What do you think can be the next step here and also considering that there is now a stalemate at the Arctic Council because of Russia? Can the issue of black carbon be revisited at the IMO?

00:17:38 Tristan Smith

So I think I think it can and I think it must be revisited because it's such a critical risk for the environment for Arctic if we don't address black carbon, we know that it's global warming potential equivalent contribution is the second largest contributor after CO2 and certainly in the Arctic. There are huge sensitivity, so if we see increased traffic in the Arctic region.

00:18:03 Speaker 5

We would just very rapidly accelerate the destruction of that. ice system and ecosystem and just make our challenge of avoiding dangerous climate change do much harder, so there's some easy winds. Good justifications to make sure that we do everything, not just at putting all our eggs in the Arctic Council basket. But the IMO, the first thing the IMO needs to do is stop prevaricating and obfuscating and define black carbon. Something that it's done.

Something that's It's kind of found excuses not to define for nearly five or even even longer years it kicked the debate into something called PR. Made it very technical and and it's just done nothing, especially during the COVID era when the lower frequency of meetings has happened so the black carbon definition is a prerequisite.

We have the evidence in the fourth liner greenhouse gas study on the significance of black carbon.

So then the third piece that you would need is some specific policy and it feels to me that there are a number of different ways in which you could incentivize certain sea areas like around the Arctic to have much more stringent see and we've got examples of those policies and emission control areas that already used for looking at specific species like Sox and NOx and by proxy PM. So I think there's no real excuse. It could be done and it needs to be done or we just accelerate the speed of global warming.

00:19:38 Beatriz Martinez

Before I let you go, is there anything we haven't touched on today that you would like to draw attention to?

00:19:44 Tristan Smith

Well so hard in 10 minutes to do justice to the many complexities and interconnections into international law, I think.

I guess I would just end with a final comment that you know there's a huge need for research to complement the processes that are being undertaken in the policy process, we, in our experience, there is a vacuum of good technical knowledge, scientific knowledge, and the combination of that with good theory, and we're at risk of leaving these critically important discussions that define the future of our society, civilization to politics, and what good quality legal research amongst others. Can do is help to make that a more evidence based discussion and so the generation of more research, the leadership that you're showing in the Center for international law is critical to minimize the amount of time that's lost in ridiculous backwards discussions that are political in nature.

When we could be clarifying things and giving people the evidence and the information they need to do their jobs as representatives as our of our societies.

00:20:59 Beatriz Martinez

With this in mind and the word ammonia, we thank you very much for today's interview has been a tremendous pleasure to have you here and we look forward to continue our conversation on this and seeing you back in Copenhagen soon to the audience. We hope you enjoy our episode and stay tuned for more.

00:21:14 Tristan Smith

Thank you.

00:21:15 Beatriz Martinez

2nd Thank you for listening to this episode of the Climate Show. If you are interested in learning more, check out the work of Doctor Tristan Smith and the UCR Shipping team at UMass. You can find the link to that and to our project InterAct in the show notes. Stay tuned for our next episode.