

**Transcript for #87. Transport Energy Outlook for 2023**  
**February 27, 2022**

Hi, everyone. Welcome to the show today. So, we are going to take a little bit of a detour from the regular interviews with guests. I'm going to talk a little bit more about, at the end of the program, about some exciting guests we have coming on the show in the full range of the transport energy space. But today, I want to talk to you about my predictions and what I'm watching for 2023. As some of you may know I'm not just a podcast host, although I do love that. I actually am a consultant and strategic advisor in the transport energy space, working on all kinds of issues. Basically, the ones that I'm going to be talking about today, everything from policy issues not just in the United States, but globally. I particularly watch Europe and several other regions and countries.

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So, we're going to look at policy market issues, another mainstay of mine, and of course, technology developments as well. So, the show today is going to focus on the 10 top issues that I'm watching for 2023, and I've separated it out into policy and market. So, I could really go on forever, but we're going to make this short, sweet, and succinct and just kind of call out some of the things that I think are really, really important to look out for what I'm watching for clients and what I'm writing about for the Transport Energy Outlook service. So, this is a membership service that clients in the oil industry, in the auto industry, in the biofuels, and advanced alternative fuels industries subscribe to. And I think it does a really good job of providing what we're talking about today, the overview of what's happening and placing it in context with where broader energy trends are headed. You can check that out on my website at [www.transportenergystrategies.com](http://www.transportenergystrategies.com).

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So, let's get into what I think are the big issues this year and what I'm going to be watching. First and foremost, it's going to be the Inflation Reduction Act from the policy side, no question, no doubt. As you know, or you may know, the US Congress enacted, and President Biden signed the Inflation Reduction Act late last summer and there's a whole range of different provisions in that legislation. A \$369 US billion dollar down payment on trying to achieve the US's climate objectives. There's really something for <laugh>, everyone in the clean energy and clean tech space, right? But there are provisions that concern cleaner fuels production, lower-carbon fuels production. So renewable diesels, advanced ethanols, advanced biofuels, sustainable aviation fuel, has a special credit.

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But there also were credits passed for the first time, a whole regime really, for hydrogen beefing up the carbon capture and storage credit, for example, reworking and expanding clean power, renewable energy incentives and so forth. So, it really was just the most wide-scale action on climate and energy arguably ever, but definitely since the 2007 passage of the Energy Independence and Security Act. So, the things that I'll be watching this year are how... so it's been passed and now the IRS, the Internal Revenue Service, has asked for comments on the implementation of various provisions, the ones that I just talked about and I'll be very interested to see how the IRS interprets those provisions and what kind of guidance is provided to industry.

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What kind of investments come out of that - the certainty that comes out of that - that will allow folks to invest. I'm working with clients actually, that are looking to do investments in these various areas in the US and I'll be watching the implementation very, very closely. I'll also be watching, although it's less the question that comes

up for people a lot is 'oh, but what about the Republicans?' What about now that the House is controlled by the Republican party are these provisions going to be rolled back? What's going to happen? And I am less concerned about that. I think there will be a lot of noise in the media. Maybe there will be greater oversight in how monies are dispersed and spent.

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There'll be increased oversight over the IRS, but do I see a rollback for the IRA itself? I really don't. And one good reason that is starting to be that I've been telling clients, and that is now starting to be reported out there in the media, is that Republican states are benefiting quite a lot from this legislation. You know, it's economic development and jobs that are coming their way. And no one wants to look that gift horse so to speak, in the mouth. So that's something I'll be watching really closely. The other thing I'm going to be watching is how other countries respond. So, Canada was, I think, among the first to really come out and say, "hmm, we think we want to do a similar type of IRA targeted for industry and our market and hydrogen."

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Supporting hydrogen development was something that really came up in the Prime Minister's mini-budget I believe that came out in November of last year. So that's one example. The other example is the Europeans looking to do something similar to the US policy to support European industry. So, I'll be watching those policies very closely. and the response as well. So that's number one. That's the big one, is IRA and all the associated impacts.

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The second one I'm going to be watching closely is how and if the various assorted policies under the EU Fit for 55 progresses forward. So, under Fit for 55, there were, I don't know, at least what, 15, 20 different types of policies that are in some stage of development. And the war in Ukraine and the energy price situation there, I think has really put a crimp on Europe's ability to finalize and promulgate those policies.

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We know that we have a CO2, a hundred percent CO2 reduction in car policy. That's among the first policies that were passed under the Fit for 55 flagship, but what I'm really going to be watching is how the others progress. The ones I'm really interested in are RePowerEU. Very interested in ReFuelEU and how the tri-log negotiation goes for sustainable aviation fuel. Similarly, I'm very interested in how fuel EU maritime how that goes. And the other one that I'm really watching is the alternative fuels infrastructure regulation, AFIR, for electric vehicle charging. So now we have this a hundred percent CO2 reduction policy, and ASEA, which represents the car industry in Europe, has been very vocal in saying, 'hey, we don't have enough charging points. There's not strong enough policies to incent the number of charge points that we need to really be able to support the scale-up in electric vehicles that we see coming and that the policy is going to cause to happen in the coming years.

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So how do we deal with that?' So that's what I'm really watching to see what those policies end up being and are they going to be enough to incent the expansion of charging. So that's just a sampling of Fit for 55, but I'm interested in other policies as well. So ETS for example, I'm interested in the core carbon border adjustment mechanism. And these are all topics that I'll be covering for members of my service, the Transport Energy Outlook.

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The third set of policies that I'm interested in this year is the revision and strengthening of the Low Carbon Fuel Standard - that's the California policy and where the California Air Resources Board lands in terms of strengthening that policy.

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There's no percentage point and date set per se, but the state is on a trajectory to reach net zero by 2045. So that'll necessitate a tightening of the LCFS far beyond what we have in place right now. And some of the modeling has even looked at a 90% reduction target by 2045. So, I'm really interested to see how that goes. There's been some modeling that suggests to me that perhaps there may not be a future for biomethane or renewable natural gas in the transportation market. And I'm really interested to see, and that was the subject by the way of FURE, I would say, as someone who listened to that public workshop in November, and rightly so, the policy actually, I would argue, incited the creation of an entire industry.

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And now the Board is saying, 'well, maybe not,' is how I interpreted it. And so that could be really problematic, and it could certainly be problematic when we consider that the USEPA is considering launching its E-RIN program to allow for the generation of renewable identification numbers from renewable electricity and that renewable electricity, at least initially, will come from RNG. So, it's an interesting dichotomy here. Doesn't mean the RNG industry will go away. I think the vision for RNG in the Board's scoping plan seems to be focused on industrial and other sorts of hard-to-abate sectors. And hopefully there would be policies that would support a transition for the industry, but it is a little bit of a rug-puller, so this isn't final action.

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It really was just, this workshop was just the first analysis in Salvo and hearing from the public, and they certainly got an earful, but I'm really interested to see overall how the board proceeds with tightening the LCFS and then what happens with biomethane in that process. I'm also watching other states and whether we'll see action on clean fuel standards similar to what we see in California, in Oregon, and now in Washington, which is launching its Clean Fuel Standard program. Last year, the state of New Mexico came very close to enacting a clean fuel standard program. We'll see what happens this year. New York is another possibility. Minnesota is another possibility, and I think there are others out there as well. So clean fuel standards are always very important for clients, and I know for all of you out there. I'm also watching to see how the Canadian Clean Fuel Regulation is implemented now that it's been finalized and promulgated.

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So, the fourth policy that I'm really watching is this national internal combustion engine vehicle phase-out slash a hundred percent ZEV target policies that are beginning to be set around the world. And I can't remember the number, but there are at least 20 or 30 countries, probably more at this point, that have pledged to phase out internal combustion engine vehicles. Actually, it's probably closer to 40. And the timeline's generally somewhere between 2035 and 2040. And now we have a number of US states that are prepared to do the same. So, I'm watching what's called the Advanced Clean Car II program that's coming out of California that was finalized last year. And there are a handful of states that I expect, and already are, following and will begin implementing that program. So really interested to see how those policies proceed or if they do.

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That's been a question in some states, like Virginia which has a Republican governor, who has tried to overturn Virginia's laws that require them to follow California's program, so far unsuccessful. But I'm interested to see how US states respond. And right now, that's from a subnational point of view, and then from a national point of view watching to see what the teeth are. So, it's one thing I think to pledge and put in a press release that you are phasing out or you're instituting a hundred percent zero emission vehicle sale, but then- pun intended - the rubber hits the road and the implementation has to happen. And I'm not really seeing a lot of that so far. There's not a lot of teeth - implementation or enforcement teeth - just yet beyond the policy that's on the books now for the EU. So that'll be something that I'll be continuing to watch.

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And then the last policy area relates to sustainable aviation fuel. So, there are a number of countries that are looking at mandates. The EU through Fit for 55 is looking at a mandate as well. So, I'll, I'll be watching to see policies in that regard. But then also with SAP, I will be looking to see how things like book-and-claim gets implemented. So, there's not an agreed upon right now or standardized approach that's been adopted by the entire global aviation value chain for the accounting and reporting of SAF. But I think that that's going to quickly change. There are two organizations, the Sustainable Aviation Buyers Alliance, SABA, and the CST Initiative through the World Economic Forum that are developing book-and-claim certificates to verify SAP volumes greenhouse gas emission reductions sustainability and other measures. So that'll be the implementation of that. And then the impact on the market is something that I'll be watching this year.

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So that is the top five policies. It's not the only thing I'll be watching this year, but it's some of the big, big, big policies that I'll be looking at. And now let's turn to the market side of the equation. So, we're on SAF. So, number six, SAF So let me read you a few statistics about SAF. Just a few years ago, not even three years ago, four years ago, SAF was...there did Pathways developed {indiscernible} was in the process of being developed. There's a lot of R&D, a lot of pilot demonstration projects, some beginnings of commercial scale-up, but not really that much.

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And now the game has completely changed. So let me read you a few market-related statistics. So according to ICAO, there are 115 countries participating in the CORSIA program at this time. So that's the voluntary program. And I think that in itself is going to translate into growing demand for SAF. So, 12 countries plus the EU are developing policies that impact SAF, just as I spoke about a little bit earlier. 38 of the world's top airlines have committed to net zero emissions either by 2050 or earlier, and almost 30 have set some kind of SAF adoption target as of November of 2022, a hundred and fifteen projects have been publicly announced globally in 30 countries with over 70 individual producers. That's a real eye-opener. announced capacity is on track to reach about 16...a little more than 16 billion liters by 2026 with the hydroprocessing pathway being the most represented at two-thirds, and I actually think the 16 billion liters is an understatement. I think we could have actually much more than that. And there are 92 offtake agreements with airlines and between airlines and producers at this time, and half of those were concluded in 2022 alone. So, it's an amazing growth that we're seeing for SAF, and it makes sense, right? I mean, the alternatives haven't quite come yet. One of them is hydrogen and one of them is electrification. Not really sure I see that happening beyond really short flights. Electrofuels still also haven't quite come yet. So, what do we have now in a hard-to-decarbonize sector with a lot of intense pressure on the airlines to decarbonize and decarbonize. Now it's SAF.

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So, I've always said that SAF is a ready market. You know, the demand was always there. I can't say that about every biofuel type that I've ever worked on in my over 25 years doing this, but SAF was always quite different. It was always a demand waiting for the production. And now that's coming.

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So, number seven - shipping. So really, really watching shipping and the race to refuel that sector. So, biodiesel comes up a lot. Ammonia is presented as an option, but the one that I'm really watching carefully is methanol. So recently for clients and the public invited guests we held a webinar web conference with Maersk with the Methanol Institute and with Methanex, one of the largest methanol producers in the world, to talk about the future of methanol, and in particular, the potential impact for shipping.

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So let me just read you a statistic from Maersk. Maersk plans to procure 730 tons per year, green methanol by the end of 2025. And then in that presentation, I can't quite recall all the statistics, but there were amazing statistics about the vessels that are in dry dock in South Korea being created that will run on methanol. So, I'm really interested to see methanol's development in the sector. Methanol is used in various aspects of the transport energy sector, but I'm interested to see how methanol begins to scale up and also very interested in green methanol and methanol as a platform for hydrogen and electro fuels production.

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So, the eighth topic that I'll be watching this year is hydrogen. So, hydrogen is everywhere. Hydrogen is like the new little black dress. I am working on an analysis right now looking at oil company investments. It's an annual survey that I do for my members where I analyze oil company investments. And the top two investments that oil companies around the world are making is number one far and away hydrogen - blue hydrogen and also green hydrogen. And the second most invested area is carbon capture and storage, which goes right along with hydrogen. So, I think the estimate, the target, for hydrogen is 500 to 600 million tons by 2050 and I actually think that that could be an underestimate given what we're seeing in terms of development of the technology. And I think that'll only be hastened by IRA policies and IRA-like policies that other countries are contemplating.

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Number nine - novel fuels. And that's renewable fuels of non-biological origin... watching those. So biomethane is one, I already talked about that a little bit. Definitely a lot of scale-up happening here in the US, also in Europe, but I'm really looking also at e-fuels. There are 14 projects underway globally. So again, a few years ago, this was a fuel that was a laboratory fuel at the demo stage and primarily at labs in Germany. And now we have companies around the world, including several in the US and most certainly in Europe, that are full scale trying to, and looking to scale up and commercialize the technology. So, we have 14 projects with an estimated 500 million liters of production potential by 2026. And I think the way things are going and again, those are pre-IRA numbers, so I think the way things are going, we might see much more than that.

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And then number 10, last but not least, is electrification. So, we have a lot more models on the market definitely in the US, in the west, in Europe, in Canada and other places. So, the pace of scale-up is something to watch.

The impact on the liquid fuel market is definitely something to watch. Really interested in heavy-duty electrification versus hydrogen development for long-haul trucking in that space. And I'm also looking at charging, so I mentioned AFIR in the EU to expand charging. Here I'll be watching the NEVI funding rollout to expand charging in this country.

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And there are a lot of issues. There are there's so much potential and there's so much funding out there as a result of the bipartisan infrastructure legislation. And then previous to that, the Volkswagen settlement diesel settlement. But I'm really interested to see how the kinks start getting worked out from the policy side. So expedited permitting, streamlined permitting for so that charging can get installed quickly. How utilities, and in particular public utility commissions, respond. I've often wondered if the public utility commission process really isn't that conducive to the quick spread of electric vehicle charging because each lot needs to happen very quickly and a lot involves the utility. But a lot needs to be approved by the PUC to make that happen. And processes can be a little slow.

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So, I wonder if PUCs will ultimately end up adapting or what will happen there. And then just technology development, it's itself. So, this podcast isn't about technology per se, but I'm interested in technology development for charging to make the charging process easier for the consumer and also for the provider or the site host and how that ends up, how that's going to roll out. So, there's so many nuances in, in the space, and I could devote a whole show just to talking about that. And this is an area that I've done an awful lot of work on over the last four or five years. So those are the top 10.

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So, before we close, we've got some great guests. I'm so excited for 2023. So, you've heard from me my top 10 issues that I will be watching. And the idea is to have the guests on from all of these different spaces to come and talk about what's happening in their companies, what they're doing, how they see the evolution of policy, the impact on the market technology development for all of these different types of transport energy issues. So, super excited. We have interviews coming up with United Airlines to talk to them about SAF. With Aramco to talk about their R&D into fuels and how they see the future of sustainable mobility for all. Super excited to have Electrify America talk about what they're doing in the charging space. So that's just a slice of what's coming up ahead in 2023. So, thanks so much for tuning in. If you're interested in these issues you're covering, you're following all of these issues, you're looking for competitive intelligence, you're looking for research analysis, contact me about the Transport Energy Outlook service. It's affordable and it's so useful in terms of providing the contextual view of what's happening in the key markets on these very, very key issues. So that's the show. Thanks for listening, and I'm excited for the adventure that's going to be 2023. Stay tuned.