

# Interview with Professor James Stock

Interviewed by Jeremy Martin, Union of Concerned Scientists. June 8, 2015

Professor James Stock of Harvard University spent two years on the Council of Economic Advisors to the Obama White House in 2013 and 2014. In that role he had a unique perspective on the challenges facing US biofuels policy. Since he left the White House, Professor Stock has continued to work in this area, publishing a report and other analysis and recommendations. I interviewed him earlier this month at Harvard. The transcript, lightly edited for length and clarity, is below.

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## ***Introduction – Role of Renewable Fuels (0:00)***

**Jeremy Martin:** My name is Jeremy Martin, I’m with the Union of Concerned Scientists, and I’m here today with Professor Jim Stock of Harvard University to talk about renewable fuels policy.

**James Stock:** My name’s Jim Stock and I’m a professor in the economics department here at Harvard and I was member of the Council of Economic Advisors for President Obama in 2013 and 2014 and worked on the Renewable Fuels Standard and other environmental issues while I was there.

**Jeremy Martin:** My first question is how you came to be interested in renewable fuels policy. Maybe you can put it in a context of broader work on climate change, energy and agricultural policy.

**James Stock:** Sure, renewable fuels as you know and as the Union of Concerned Scientists has made clear for many years, can potentially be an important step and an important component in our broader transition to a low carbon economy.

The White House and the EPA have taken important steps in other aspects of environmental regulation recently in terms of proposing emissions reductions for fossil fuel fired power plants through the clean power plan. And a vision for that transition to a reduced carbon footprint and ultimately to a no carbon footprint in the more distant future can be seen through the Clean Air Act and through the actions that the administration has taken.

The challenges in the transportation sector are even more significant than the challenges in the power sector. In the power sector we have technologies that can work, the technologies are not necessarily that cheap, and they need further work and they need to be integrated into a reliable grid, and there are important technological steps that need to be taken. But at the same time we can see a path of transition towards natural gas and then a transition towards renewables and those technologies are tangible and can be implemented.

The situation in the transportation sector is just so much tougher because all of our infrastructure is oriented around liquid fuels, and particularly around petroleum fuels, and although there are visions for the future. Those visions of a fuel cell future or an electric car future are great ones, but those are a long ways away and they require a completely clean power sector for those really to be met.

So the thing that's so interesting and so exciting about biofuels and renewable fuels is that it provides a very realistic path in my view as a transition towards a low carbon economy. And even in the long run there's going to be circumstances in which liquid fuels are going to be incredibly important.

### *Future of the Renewable Fuel Standard (3:18)*

**Jeremy Martin:** That's good motivation. [The report you wrote on the Renewable Fuels Standard](#) was really useful and interesting and helpful to me. It pulled together complicated arguments from a variety of sources in one place. But it's still a very inside the beltway and technically dense report. So I wanted to step back and start with what you think are the most important goals that the renewable fuels standard is designed to address?

**James Stock:** Well biofuels policy and the Renewable Fuels Standard is just incredibly complicated. And that makes it interesting, but it makes it challenging to communicate to a broader policy audience. Look, I mean there are a couple of really key things to remember. One of the key things to remember is that the transportation sector needs to have a path to transition to a low carbon future. So it needs to be able to reduce its GHG footprint in a meaningful way over a decade and two decade timescale. We can't just wait until 2060. So that's point number one.

Point number two is that even though we have had this increase in hydraulic fracturing and an increase in domestic oil production we still import more oil, we still are net importers of oil. And that fact that we are a net importer of oil means that we continue to be vulnerable to international fluctuations in oil prices and to international disturbances. And there is a meaningful contribution to energy security by having domestically produced biofuels.

So that's what the original act that set up the RFS was about. It was about energy security and it was about reducing the GHG footprint and those goals are both valid today.

**Jeremy Martin:** The original policy was passed in 2005, amended in 2007, rules finalized in 2010 so we are somewhere between five and ten years into it. How do you think it's doing so far?

**James Stock:** Well, that's a complex question and I'll try not to give an inside the beltway answer to it. Look, the legislation is a really complicated piece of legislation and there are certain aspects to the legislation that have made it very difficult to implement. But that said there has been a large increase in biofuels, that increase in biofuels is first generation fuels. Those first generation fuels are corn and biodiesel and renewable diesel in part from waste grease and other sources and in part from food stocks sources such as soybean oil.

Those fuels are domestic, so they have enhanced energy security from that perspective. But in a greenhouse gas perspective although there are substantial contributions from biodiesel I view those fuels as being first generation fuels. And those first generation fuels are meant to set the stage for second generation fuels. And so although there has been quite a bit of success for these first generation fuels, the second generation fuels have not developed as rapidly as we would have liked. And so that's been, I wouldn't say a failure of the RFS, it's certainly been a disappointment in terms of what one would have liked to have seen.

I'm going to emphasize that that disappointment is not really, there's a lot of external factors that contributed to that. For example the great recession. Look investment across the board in the great recession just plummeted and it took a long time for the financial sector to recover. We're only now fully recovering from the great recession so among the many, many sectors that suffered investment hiatuses one of them was advanced biofuels. There have been some technical problems too, and then there is some aspect of this that is associated with uncertainty in the RFS regulations. So a number of features together conspired to slow down the progress of advanced biofuels. But I think now we are looking at an opportunity to reset everything and to start making progress in those areas.

### *Three Paths Forward for the Renewable Fuels Standard (7:47)*

**Jeremy Martin:** So in your [report at Columbia](#) you laid out three possible options. I thought it might be worth describing those briefly.

**James Stock:** So roughly speaking I do think we are at a crossroads and some important decisions have to be made. And one approach, one of the options, is to just do business as usual, which is to solve this year's problem this year using some ad hoc method. And I argue that that's a really bad idea because this whole industry issue is about providing clear guidance so that people are going to be willing to invest in second generation biofuels and invest in the infrastructure necessary to get the fuel out. So we've got to have a path. So year by year, option one is year by year, dealing with it as it comes, I think that's not a good path.

Another path would be to really retrench, and to say we're going to dial back on all of the first generation fuels and we're not going to try to get more ethanol especially out into the marketplace. We'll try to do our best to support advanced fuels and cellulosic fuels for example. But we'll dial back in a significant way in terms of what's actually expected.

And then the third option would be to take a really aggressive path and to lay out a really aggressive path. And then there's some specific legalistic aspects of taking that aggressive path. I ended up being supportive, but very cautiously supportive of the aggressive path. The aggressive path would provide a clear signal that we are going to get more ethanol into the market. And it would provide a clear signal to cellulosic producers and advanced fuel producers that there will be a role for their fuels. But it's a

really risky path because it entails setting out volumes that are, many would argue and I would think might be unrealistic.

What EPA's actually done is, and they just announced back at the end of May, they announced what their 2014, 2015 and 2016 proposal is going to be. And what EPA has actually done is I would categorize it as being in the aggressive category, but it's measured. So it's a measured but aggressive path to get out more biofuels and most importantly I think to send two things, a clear signal to the advanced community, that EPA believes that the advanced fuels are what the RFS is about. And second, one of the mechanisms for supporting the advanced community is by getting more ethanol into the marketplace through higher blends. They took a fairly aggressive stand about getting more ethanol into the fuel supply. And that was actually partnered, with the administration coordinating this, with an announcement by USDA that USDA is going to support putting more blender pumps into gas stations with a goal of really increasing them by a lot and getting a lot more fuel out there.

**Jeremy Martin:** OK, so path three seems to be the way that we are headed.

**James Stock:** Path three is the way we're headed.

### *Addressing Policy Uncertainty (11:20)*

**Jeremy Martin:** So there were two key topics that I took away from your report. You've alluded to them both already but I thought we could spend a little more time. The two being uncertainty, how to reduce policy uncertainty and the other one related to the blend wall. Do you think that this proposal does significantly reduce uncertainty?

**James Stock:** So let me just step back I think one of the problems we have had over the last couple of years is we have had a lot of indications in the market that there is uncertainty associated with EPA activities and EPA plans and administration plans for the RFS. That has had the effect, in my view, it has resulted in the worst of all worlds, because it has resulted in high compliance costs, to a large extent stemming from that uncertainty and that compliance cost comes in the form of what you have to pay for RINs the compliance permits, but at the same time because of the uncertainty it's not clear whether somebody would actually build new E85 dispensing stations or would you actually build a new cellulosic plant because you don't know where it's going. So we're having high costs but we're not getting the investment. And so that just isn't what the program's about. The program is not about imposing costs but not getting progress. It should be the other way around, if we are going to have costs, let's at least see progress. And ideally let's see progress while keeping the costs down.

And I believe that what EPA did is it sent a pretty good message that indeed what it wants to do is it wants to see progress, it wants to get more blender pumps out, it wants to sell more ethanol into the marketplace through higher blends, it wants to support advanced technologies, and more cellulosic ethanol production in particular. But at the same time it would like to keep costs low by not going unrealistically far in terms of pushing out the blend wall. So overall it tries to set out this sensible middle path. I think it could have gone farther in terms of providing more certainty to the marketplace. It does a good job of giving a picture, and saying what's going to happen in 2016. We don't know what the 2017, 2018, 2019 scene is going to be. And if I was making investment decisions I would want to know.

**Jeremy Martin:** So do you think there is more that they can do as far as laying out multiyear guidance?

**James Stock:** It's difficult within the context of the statute to provide multi-year guidance because ultimately EPA is required to set annual rulemakings and annual volumes, but that said they can tie their hands by laying out some formulas, and some paths and some plans. And then once that's in regulation that's going to be something that subsequently parties can look back on and say hey you told us this and shouldn't you now follow through on it. So what I would really like to see in the final rule is I would like to see additional guidance going forward. Some of that guidance could also be given through speeches. It could be given through formulas that are put out to the public or other frameworks. You could even imagine an advance notice of proposed rulemaking put out for the resets in 2017, 2018. Now I know I am a little bit inside the beltway on this, but there are important milestones coming up.

**Jeremy Martin:** Well that piece has been something that's had my attention for several years, which is, just to clarify, that if EPA makes significant waivers they need to reset the targets for 2016 to 2022.

**James Stock:** And what EPA has said in the rule is that they want to stand behind promoting domestic biofuels and stand behind the intent of the statute, which is low GHG, advanced, domestic, energy security. But wants to do that in a way that the market can realistically handle. And I think what we don't really know is what that last little caveat actually means. So how are you going to set E85 or ethanol targets above the blend wall going forward? What's that path going to be? I think that's a critical path, Another critical path is how are you going to set the total advanced standard going forward and what's the framework for that. And then there are some very technical issues that need to be resolved about management of the cellulosic standard.

### ***Blending Ethanol Beyond E10 (13:35)***

**Jeremy Martin:** Switching gears a little bit to look specifically at these blending questions, getting more ethanol into the marketplace. One set of discussions, especially from the ethanol industry, really focuses a lot on E15, and another set focused on E85. Your work focused more on E85. So I would love to hear you thoughts on those two alternative ways of moving forward with more ethanol.

**James Stock:** So let me just say that in terms of more ethanol in the marketplace, that's important for two reasons, and they might even seem contradictory but they're not.

So reason number one is that the bulk of the costs associated with the RFS right now are arising in part from uncertainty, which I hope is now being resolved, but also in part from the blend wall. And actually moving out the blend wall, that is being able to get more of the higher blends into the marketplace is somewhat confusingly, but would actually end up reducing costs. So I think that actually getting more higher blends out there in a proactive way is something that will end up reducing costs to the consumer. The second reason that it's important is that the most promising new fuels are cellulosic biofuels, and cellulosic ethanol in particular. And we actually are seeing the first commercial scale plants coming on line right now. And one wants to make sure that there is room for cellulosic biofuel in the marketplace and that's another reason to expand it and to provide the signal that you build a cellulosic ethanol plant and you'll be able to sell the stuff.

So those are the two reasons that I would say that getting more ethanol in the marketplace is a good thing. Now E15 versus E85, I happen to be of the view that E85 makes more sense because there is a bigger upside in terms of the volume that you can get out. A flex fuel vehicle can consume an awful lot of ethanol and E15 has been fraught with problems historically. It might work out it might not work out.

I'm hopeful, especially with this USDA program that we don't need to think about it as either or. The structure that one can accomplish with a blender pump would be one where, it could be you could have E15 and E85, just different buttons on the same pump. And if that's the solution, if the solution is blender pumps that have an E15 and an E85 pump, probably they are going to have to be in the stations that have a third tank, that's going to be able to supply the ethanol. But that seems like the easiest solution of all, and one that works for both of these parties. And maybe E15 will take off and if it doesn't there's E85 as an option. And moreover then those pumps would be able to be retrofitted or adjusted if you wanted to have some intermediate blend, an E30 or an E25 or something like that.

### *Performance Based Fuels Standards (20:22)*

**Jeremy Martin:** Another of the things you suggested would probably require legislation, but consider a renewable fuel standard where the RIN, the compliance value, was dependent on the greenhouse gas reduction score. So a cleaner fuel would generate more compliance value than a less clean renewable fuel. Can you just talk a little bit about why this approach would be advantageous?

**James Stock:** Let's just step back and remind ourselves in terms of the first principals why we are interested in reducing greenhouse gasses. Well that's because there are damages associated with climate change. And so my consumption of gasoline that has petroleum in it is emitting CO<sub>2</sub> and that I'm not paying for that. We don't have a price on carbon in our economy. Economists would all say that the first best solution would just be to have a tax on carbon or a tax on CO<sub>2</sub> emissions or carbon at the wellhead, and that would internalize that externality.

So if you step back and try to think about how would the world look if we had a price on carbon that internalized this externality well you would see differential prices. You'd see prices for a very high CO<sub>2</sub> fuel, such as coal, have a really substantial carbon tax associated with it, it would be a little bit of a less carbon tax or substantially less carbon tax for natural gas and somewhere in between for petroleum. And then when you get to a biofuel, say for example a cellulosic ethanol that has an 85% reduction lifecycle GHG footprint compared to petroleum, then it's going to have a much, much lower carbon tax. So what you would see is you would see a carbon allocation. So what you would see is you would see this differential these price wedges starting to open up.

And one way to think about the RFS is actually it is structured in a way that there are these different pools based on their GHG reductions and so the prices and the price differentials are reflected in the price of these RINs or these compliance permits.

And so as much as the RFS doesn't look like a carbon tax, it actually has features that one can think about from a policy perspective as consistent with having a price on carbon that's differential among these different fuels. If you take it to the next step, what it really says is well gosh, why don't we just say that there is a different price for these different fuels.

Maybe the first best would be a carbon tax. We are not going to necessarily have that as an economy wide thing, but we could have a partial way to accomplish that through differential prices within the fuels. And now you are looking at something that is actually maybe somewhere in between the RFS as it currently exists and a low carbon fuel standard such as it exists in California.

**Jeremy Martin:** Well so first a specific question about that. So would you envision that rather than having multiple categories of RINs just have one but then say cellulosic if it is 60% or 80% cleaner would be worth three or four times as a conventional?

**James Stock:** So there's the theory and there the practice. And the theory is yes you would have a single price on carbon and each fuel would be assessed a different price on carbon and there would be some carbon credits or carbon offsets or carbon prices that would be associated with that and there would be some mechanisms to work that out maybe one that is similar to the LCFS. That's the theory but then the practice is well is it 80%, or is it 78% or is it 82%? And I'm no expert on lifecycle GHG footprint analysis but I'd be pretty comfortable betting that those guys are not going to get it down to that second decimal point or that is it 82% or 78%. So actually kind of a nice feature in practical sense of the way the RFS is set up is that the RFS has bins, and those bins are based on GHG emissions reductions. And yeah, you know the 85% fuel probably should be getting more of a benefit than the 80% reduction fuel. But our ability to measure that is so poor that thinking about binning and working with something not too different than the RFS bins seems to me to have a lot of practical appeal.

**Jeremy Martin:** Well so the bins have appeal but you could imagine sort of keeping of them in the bins but I guess if we look at the RIN markets, and we've seen all the RIN prices collapse on top of each other so there wasn't much difference in value between an advanced RIN that symbolized represented a 50% greenhouse gas reduction and a conventional RIN that represented 20 or less if it was exempt. So I guess you could keep the bins but still have one or have a multiplier so they were tradable against each other or something.

A- Yeah, there are a number of ways you could implement that. That wouldn't right now, I'm no lawyer but my understanding is that it would be a difficult push legally within the EISA as it currently stands to change the RIN structure so that there were multipliers. That would be one way one could implement it. I think that would require legislation. If it does require legislation then I would say let's just go to a straight price and one way you could think about that is a RIN price for the different bins a RIN price collar or maybe you could allow these fractional variations but then have an ability to actually set the price so you don't have these wild fluctuations.

**Jeremy Martin:** So you mean with a collar and a cap

**James Stock:** Yeah, that's right a floor and a ceiling. A trading floor and ceiling.

## *Fuel Standards for Fossil Fuels (26:48)*

**Jeremy Martin:** So one of the key difference between the Renewable Fuel Standard and the Low Carbon Fuel Standard, especially in theory, is that that the Low Carbon Fuel Standard regulates all fuels, including fossil fuels. And so to the extent that some of the new unconventional oils have higher carbon intensity that's also captured. Again that's, there are some important details in how the Low Carbon Fuel Standard works, but at least in theory it has that breadth of scope. So I wonder if you think that's an attractive, and obviously not within the legal framework of the renewable fuel standard, but is that where we should be headed, or not necessarily?

**James Stock:** So the reason that I have this sort of despairing look is that sure the theory of a low carbon fuel standard, the theory of everything I just said would lead you down that road for non-renewable

fuels as well. But the trouble with all of these lifecycle footprint problems is that there just this bottomless pit, and at some point it leaves me yearning for the simplicity of a carbon tax.

The thing that's interesting about a carbon tax is that that would solve the problem for the non-renewable fuels, for the petroleum based fuels. Because the reasons that those have larger footprints is because they take more energy to extract and so they are using presumably fossil energy to extract them or more energy to refine or transport so that actually is going to be incorporated directly into the price if there were a carbon tax. Where the carbon tax doesn't work directly is with land use change component of biofuels.

**Jeremy Martin:** So that sort of justifies a unique treatment for biofuels.

**James Stock:** right

**Jeremy Martin:** Well of course on the fossil fuels one of these high carbon unconventional fuels people are concerned about is the tar sands, and those aren't extracted inside of our borders. But I guess that's a solvable problem?

**James Stock:** In theory that's a solvable problem. I mean they are meeting in Paris at the end of this year and they are meeting in Bonn as we speak, that's one of many items on the list. Figuring out a way. That's a special case of the problems they have to solve.

### *Picking Winners and Network Externalities (29:03)*

**Jeremy Martin:** One of the ideas behind the low carbon fuel standard is this idea of technology neutral performance based policy. And this is very attractive to policy makers in theory. But you know after having spent a lot of time thinking about the blend wall and things like that it becomes very clear that we don't sort of have a technology that has a cost and a carbon emission and then they just compete on feasibility and emissions, there's a lot more to it than that. And so I guess I am curious you know how to balance this desire not to pick winners against this sense that you know if you really don't pick winners maybe you've just picked all the incumbent technologies.

**James Stock:** This is just a terrific point and I think that people don't... It takes a while to come to this understanding. Again I went back to If I don't want my membership in the American Economic Association revoked, then as all economists would say the cleanest solution is a carbon tax, but the problem is in the energy sector, and especially in the transportation sector, that's not the only externality.

So the climate externality is the driving externality but it's not the only externality, there are two other externalities that are important. One is the standard old fashioned R&D externality. Which is that if you do basic research and development then you publish some papers then someone else can commercialize it, so you're not going to be able to recapture or recoup all of the expenses that are associated with that, so we'll have underinvestment in R&D. The classic solution to that is NSF and other government programs. DOE programs and so forth that would stimulate early scale investment and early scale R&D and maybe some development efforts as well. That's just as important here. Even if we had a carbon tax that's still important because we still have that other externality.

In the transportation sector we have a third externality. And that third externality in the transportation sector is what's called a network externality. And that network externality means that a decision that I

make about installing a blender pump, not all of those benefits are going to be recouped to me. Because we can actually imagine having two different equilibria. One equilibrium where there are a lot of E85 users, a lot of flex fuel vehicles and one equilibrium where we just stay at E10 and we are constantly at this blend wall. And you can imagine both of those equilibria working, and actually one can imagine that the E85 equilibrium might be a better equilibrium if we are filling those E85 tanks with a low GHG cellulosic ethanol but the question is how do you get from here to there. And it's kind of like you have these two equilibria, maybe one of them is even better, but you have got to kind of get there. And you've got this valley or something that you've got to traverse to get from here to there. And any one individual is going to be facing up against this blend wall problem and the fact that well I can sell E85 but no one even knows that they have a flex fuel vehicle why should I bother doing that. Or if you are thinking of buying a flex fuel vehicle, well gosh why would I do that if there is no E85 dispensing stations. So that is a classic third role for government in terms of saying if we think there is another equilibrium out there that's a better equilibrium then we have a role for helping to move there.

This comes up in technology policy all the time and you know, is it picking winners and losers? I guess it has a little bit of that feel but I would rather think of it as keeping options open. In this case, in terms of the options of having some success in these technologies that otherwise simply aren't going to have aren't going to be able to compete in the marketplace because of these multiple equilibrium problems.

### *Impact of Government Service on Academic Work (33:04)*

**Jeremy Martin:** So I want to shift gears a little bit and talk about some general science policy questions. So starting with: You've acted as an advisor to President Obama on the Council of Economic Advisors and I think also to the Massachusetts Governor, is that right, Duvall Patrick. So how has your service in government shaped your policy work or your economics work when you've come back to Harvard?

**James Stock:** That's a great question. So first let me just say for both of those administrations, but I'll just focus on my more recent work, working for the president. One thing that I was really impressed by the seriousness with which the administration takes substantive analysis. So in my case it would be substantive economic analysis. Now that substantive economic analysis is not just abstract theory for publication in some journal, it's actually analysis that really speaks to a very specific problem. But the time constraints that the policy world has to work on work under are really difficult ones, and having outside experts provide germane and reliable analysis I think is really valuable. So I think that's an important lesson that I've taken away in terms of how can my economic work, my academic work be more directly useful to the policy world in terms of providing information

**Jeremy Martin:** And so that's some of the motivation to keep thinking about a policy which has a niche audience like the Renewable Fuels Standard even after you've left the...

**James Stock:** The RFS I will admit is a niche audience. One that you're a member of, but I really do think it's important, and I am going to go back to how I opened up. It's a big deal, we don't have a practical vision for the transportation sector reducing its carbon footprint over the next ten or twenty years and we do for the power sector but we don't for the transportation sector. And this is the tool we have.

**Jeremy Martin:** Well I think it is very much a key next order of business.

## *Evaluating Evidence (35:30)*

**Jeremy Martin:** So I guess in what you just said you talked about needing that, when you are inside the process, sort of relying on people outside who can give you good analysis. I'm sure you get lots of people coming to you with analysis, industry consultants, groups like the Union of Concerned Scientists and others, and I am curious how you assess the reliability of the information that you get. Do you mostly rely on your own analysis or how do you deal with all that.

**James Stock:** I will tell you a little story here, I won't tell you the group, but I will tell you it wasn't in the fuels area so you won't be able to guess, but there was somebody flipping through a deck, and they had a particular view that was in favor of a particular industry and they were looking at jobs in that industry and they are comparing it to jobs in another industry and we were flipping through the deck and our industry grows many more jobs than this industry. And I just said no, I just looked at those data and I thought that's not right, and I said can you go back, and their deck had quarterly growth of jobs versus monthly in the other industry.

So it's kind of fun, because you're always on your toes, you know that someone is trying to game you, in a lot of these circumstances. At the same time you know that there is going to be information from industry that you simply don't know. So having a conversation with industry representatives is really important because you want to learn more information, so you're constantly trying to sort out the quarterly versus monthly.

I have to say that's one of the places that a group like the Union of Concerned Scientists can be really valuable because they really are more of a third party they're certainly not representing industry on one side or the other and that makes them a very helpful group.

**Jeremy Martin:** That's what we try to do. We try to do our own analysis and provide input but we also try to reach out to our members and to the scientific community and advise them, scientist and citizens, about how to engage in government productively and actively. And I'm curious if you have thoughts about how, being on the receiving end of input, what's particularly useful

**James Stock:** That's a great question, so what's most useful is, from my perspective what was most useful is facts and unbiased analysis and helping to see larger pictures when everybody's caught up in details. What's often least useful, what undercuts that the most is when there is an attempt to present those facts or that larger analysis in the context of what you think the politics might be doing. I don't mean you, but what the person on the other side of the table thinks the politics might be doing.

I'll tell you one thing the White House is really good at is reading the politics, the White House is better than they are just really good at it. And something I learned is look I am never going to be that good at reading the politics so my job is just trying to get these facts as accurately as possible that can inform these decisions and help guide those decisions. And I think that outside experts, especially third party experts, that's really where they can be most valuable.

Whatever you read in the newspaper is about half of what's going on.

## *Dueling Economic Studies (39:21)*

**Jeremy Martin:** One question I am interested in is industry often hires consultants to do economic studies and occasionally NGOs do, non-profits sometimes the Union of Concerned Scientists does. I

guess I wonder are these useful and persuasive, and a related question is do you think those studies are for the economists inside or are they for a different audience or purpose?

**James Stock:** I think that those studies can be useful. It depends on how many there are and whose doing the study. If it's from a very specific interest group and you can guess. It's a useful exercise when you get a study from an interest group, is to guess what the findings are, and if you are right then it kind of undercuts the whole point of the exercise. Let me give you an example, where we had a number of competing studies that taken together it was really informative. And that's in the oil exports debate.

So the oil exports debate there's a question of what is the effect on the economy, how many gallons or millions of barrels a day would go out, and how likely is the refining capacity to change, the refining infrastructure to change, how would it actually get out and what might be the employment effects of all that. So every single one of the studies had strengths and weaknesses. There were several of them, four or five, I don't remember exactly and they all had strengths and weaknesses, and by themselves each one was not so terrific, but taken together and reading across them actually was very informative. And so that was an example of where the public debate was really furthered by some of these external studies.

### *Broader Lessons of RFS debate (41:30)*

**Jeremy Martin:** So back to the RFS in a way, but thinking more broadly. In the case of both the RFS and the Low Carbon Fuel Standard, these compliance credits called RINs, create a market and there has been some turbulence in those markets. A lot of environmental policy proposals have those features, those environmental permits. And so I am curious if you think there are some broader lessons on policy design that come out of the first five or ten years of the RFS?

**James Stock:** So there is a classic question in economics about regulation in quantities or regulation in prices. And a lot of industries, for some reason, we've chose to go down, for various political economy reasons, we've chosen to go down a road where we are regulating quantities but we are using permits that then fluctuate in terms of prices. And there might be political economy reasons for that but actually from an economic perspective a lot of price fluctuation is not so terrific. Because you can't build in to your plans, if prices are all over the place, how can you build that in to your cash flow analysis, how can you take that to an investor group, and how can you plan for the future? It exposes various parties in the whole regulatory structure to risk. So a lot if economists, and I certainly put myself in this camp, would much rather see price regulation so that there is a price for example reflecting the carbon and energy security benefits of low carbon domestic fuels and then you can just count on it, and it's there for an extended period of time and you can take it to the bank.

One thing we did that is along those lines in the administration is that in the 2014 budget, and I believe it's back in the 2015 budget as well, is we proposed a ten year, one dollar a gallon cellulosic biofuels producer tax credit. So that is a dollar, and it was going to phase out towards the end, but it's there, and it's there for ten years with a phase out, so that's a dollar you take to your investors and say that's really going to be there. So that motivation is for nascent investment new technology side of things. That seems like the sort of thing that adds certainty.

**Jeremy Martin:** Absolutely, but I guess one challenge is then that's a tax expenditure as opposed to a compliance cost, so that's a different a different challenge, I guess that's the political economy

challenge. So maybe the thing that relates those two is things like collars on credit prices which adds a degree of certainty without going all the way to...

**James Stock:** And I think a lot of debate surrounding the RFS has been because of the really large price fluctuations in RINs and some obligated parties are legitimately saying gosh you know I didn't sign up for this. Why am I, I understand that we have this program, but why am I supposed to be paying numbers that jump around all of the time, that's not my line of business. And that's a legitimate concern.

### *Connection to Agricultural Policy (45:24)*

**Jeremy Martin:** A lot of people come to this question from an energy policy lens, and then there is a whole set of transportation fuel and how this affects vehicles, but this is also a major agricultural policy, and there is a whole history and set of different interest groups and different set of policy precedents, and so that what makes this rich or maddening, depending on the day, I wonder if you have thoughts about those three streams coming together?

**James Stock:** This is, that's really important because it's different than. It's important to recognize that yes there are these three streams and they include agriculture, and that component is not present in most of the other areas that we discuss energy, that is actually it was a part, rural agricultural development is an explicit component, it's one of the several goals of EISA. And that was a goal of Congress.

It's important to recognize that one can be very pro agriculture and one can be pro biofuels, and that doesn't necessarily mean that one needs to pay attention solely or even primarily to first generation biofuels. After all if you are going to be using corn stover to create cellulosic ethanol, that's coming off of a farm field too. And if you're going to be growing miscanthus or switchgrass or some other energy crop that's going to be going into cellulosic ethanol or a drop in cellulosic fuel, somebody's growing that. That's a farm also. And so those are agricultural activities. Ideally we would see agricultural activities that are not food competing. And that would be a long term hope also.

**Jeremy Martin:** Great, so I think this intersection with agricultural policies is really important, do you have any thoughts about how the different agencies work together in this space.

**James Stock:** Yes, so one thing that I think is a really good component of the proposed rule was not just the rule but the fact that it was partnered with the Department of Agriculture's announcement that it is going to support up to one hundred million dollars in grants in blender pumps. And if you go back to this question of multiple equilibria or this question of how do we make that transition from E10 to a large number of E85 stations out there, that's exactly the sort of policy that is justified in the context of thinking about government moving from one equilibrium to another equilibrium. And in this particular case the USDA is planning to do it by partnering with industry and with the states and that's going to not just increase the leverage for the funding, but it's going to get buy in so that these are not just pumps that are put in some useless location but actually the goal is going to be selling more E85 selling more ethanol.

**Jeremy Martin:** Well certainly that is one of the core challenges facing the next few years of this policy especially.

**Jeremy Martin:** So thanks very much for taking the time to discuss all this with me and for all of your work at the Council of Economic Advisors and subsequently, I really appreciate it.

**James Stock:** Thank you Jeremy it's been great fun talking about this.