



Illinois Department of Commerce & Economic Opportunity

JB Pritzker, Governor

Hydrogen Economy Task Force

November 12, 2024

8:30 am to 10:00 am

Minutes

Location:

Virtual WebEx Video Conference

Meeting link: <https://illinois.webex.com/illinois/j.php?MTID=m90dfc7932c4c9c0caf9a0e1a5748538b>

Meeting number: 2866 136 8928

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I. Call to order at 8:32 am.

II. Roll Call of Membership by Aaron McEvoy.

Rep. Terra Costa Howard: Yes

Sarah Duffy: Yes

Patrick Evans: Yes

Rep. Bradley Fritz: Yes

Jim Hoyt: Yes

Dan LeFevers: No

Carly McCrory-McKay: No

Chad Parker: Yes

Laura Roche: Yes

Dr. Petros Sofronis: Yes

Michael Wang: Yes

Patrick Devaney: Yes

Sen. Laura Ellman: Yes

Kyle Freeman: Yes

Jon Horek: Yes

Elizabeth Irvin: Yes

George Letavish: Yes

Dulce Ortiz: No

Sen. Sue Rezin: No

Doug Scott: No

Catherine Stashak: Yes

Dana Wynn: Yes

III. Approval of 9.10.24 Minutes

Rep. Terra Costa Howard motioned to accept the minutes from September 10, 2024. Patrick Evans seconded. The motion passed unanimously by voice vote.

IV. Chair Report

Senator Ellman stated by mentioning the conference held a month ago in Chicago where, we met some industry stakeholders, heard from the city of Chicago, heard an analyst who Aaron and I were talking might be a very good person to bring to the task force for their views and, I thought it was a good conference. It was good to hear from people in the industry and you know that there is momentum on hydrogen production infrastructure and use. So, I think there is still a lot of unknowns and the level of uncertainty, given last week, really brings the spot prospect of hydrogen here in Illinois and around the country, it makes it more unsure in my view. So, with that said, one of the things on the agenda we will be talking about laying the publication of our report from December out to February because in addition to these unknowns that our new administration will bear on us. The 45V rules have not been finalized and MachH2 production here in Illinois depends a lot on what those 45V rules will mean. So, the theme of my report right now there is a lot we do not know. So, all the more reason to learn and to bring into focus what is going to happen in the near future regarding hydrogen.

V. Topics Presentation (Vehicles)

Dr. Petros Sofronis presented on, "Hydrogen Fuel Trucking: Why it makes sense for Illinois".

Dr. Micheal Wang asked I know of the DOE hydrogen hub in California has very strong efforts in end use in transportation. Do you know if our MachH2 hub has ended use proposed for transportation, and any response from the DOE that ended use in MachH2 will include transportation besides California?

Dr. Petros Sofronis replied by saying, definitely as you mentioned I know that the California hub is moving forward full steam ahead as we say. In fact, I am talking with Bill Elrick, who is as you know, the executive director of the Hydrogen Fuel Cell Partnership (HFCEP), in fact the fuel cell partnership is heavily involved with the California hub. So, the project of heavy-duty fuel cell transportation is moving ahead. Now regarding our hub, the only information I have is from our colleagues at BP Whiting who are somewhat not certain about how they will move forward with their hydrogen project and partly because still funding has not been released to MachH2 and partly because BP is reassessing how they will move forward with their hydrogen projects. This is the latest information I have from BP Whiting, but I don't have any other information from the general leadership of MachH2. I say BP Whiting because BP Whiting is collaborating with the University of Illinois in areas that will assist the engineering of BP Whiting's planned hydrogen systems as soon as MachH2 gets the funding.

Senator Ellman asked whether it be out in California or with the roadmap that you have just presented, what is the role of the OEMs, the people who make truck motors and that are making the diesel engines right now and fuel cell engine production?

Dr. Petros Sofronis replied saying, the OEMs are extremely important here. For instance, as you have seen in the October the 8th meetings in Chicago (National Hydrogen Day). In the morning of October 8, I was at the headquarters of Hyzon Motors in Bolingbrook, Illinois. There we had a

navigation through the production of fuel cell engines for heavy-duty trucks, class eight trucks. So, OEMs are very important. Hyzon fuel cell engines are ready to be used with refuse trucks and systems. Hyzon argued that having fuel cell trucks is something that the owners of these fleets, for example the city of Chicago, and drivers would love because such trucks are not different from the standard diesel trucks that we have today. In other words, Hyzon Motors is ready to help develop the heavy duty truck economy because they can provide those trucks. However, the problem is, as they mentioned, there are no end users. In other words, they have the engines, and they are ready to sell them but that there is no market. So, I think this is a dilemma now that they face, and I think it is a very serious dilemma. So that is the central aspect of where the OEMs are. The same will happen with the refueling stations that we need to have, the dispensers, the companies that will produce all these items. So, I believe the technology for the hydrogen economy will be there once the market develops, but how the markets will be developed is the kind of a chicken and egg problem that I am not sure that individual companies can solve. Unless, let us say the city of Chicago decides, say tomorrow, to buy a large number of hydrogen fuel cell powered trucks for garbage collection. That somewhat may catalyze a market development and who knows, from there things can start moving forward.

Senator Ellman replied saying, it looks like the roadmap right now is for the near term is to start building that infrastructure and kind of a build it and they will come approach.

Dr. Petros Sofronis said, I think we can start somewhere, I am working with my university, and I have been asking, let's build hydrogen refueling station here and let's have a hydrogen car. For instance, we receive every year, I mean hundreds and hundreds, thousands, I would say visitors from all around the country, all around the world. Let's pick them up from Willard airport with a fuel car and bring them to campus to give their presentations and drive and drive them around. This is happening in California at the University of California Irvine, that is how California moved. So, we need to start somewhere, and I think our university can help.

Senator Ellman read Craig Connelly question from the chat asking, "are there other public transit agencies in Illinois that are also considering hydrogen fuel cell electric vehicle and is there a case study of the costs and benefits from the Champaign Urbana MTD experience?"

Dr. Petros Sofronis replied saying, regarding the first question, I do not think there is any other. The Champaign Urbana MTD is the only one in our state. Regarding the cost benefit analysis, I do not have the facts right now, but I may quote anecdotally what the director of the MTD told us that if we want to buy two battery electric buses, we better buy three because one will always be charging. So, this is partly the reason that the MTD moved to the fuel cell bus because they feel that it is more reliable in many aspects. But Senator, I will talk with the director of the MTD and provide this information on cost benefit analysis.

Sarah Duffy asked are there any examples of actual heavy-duty truck... My understanding was that local transit agencies, like local transportation buses and things are not those kind of fundamentally different than heavy duty freight transportation trucking? And I thought the presentation was really interesting, but I thought it was more focusing on the heavy duty like

freight transportation, so I guess I am trying to understand what we can learn from a local transit example that would be transferable to heavy duty freight trucking.

Dr. Petros Sofronis replied saying with the heavy-duty trucking, as we say classes seven and eight, you need more powerful engine. And as far as I know, for instance, the truck engine is about 200 kW whereas the MTD bus engine that you see, is only 100 kW. So, depending on the payload you have a different engine. But my understanding is the range between 200 and 250 is for heavy duty trucking, the class eight trucks that we mentioned. Now, whether we have truck fleets around the country running on fuel cells, I do not think we have right now. The most recent information is that Nicola just sold about 40 of those trucks. I don't remember exactly the recipient of those trucks, but there is out there. This is a piece of information that I will provide to Aaron so he can distribute it. So, there are not any fleets that are going around. No.

Aaron McEvoy mentioned that Elizabeth Irvin shared that when she says MTD, so for Champaign Urbana has done some workshops for the Illinois transit agencies and other agencies across not only Illinois but the Midwest, and they are happy to be a technical resource for those considered being hydrogen. So just keep that in mind.

Chad Parker asked, in regard to the actual fueling stations, the hydrogen fueling stations that these buses and heavy equipment are, heavy transports would also be using. Would these all be available to all in entities, not just fleets, but for various different fleets across the entire market, various different aspects? Or are these fueling stations actually designed just for fleet work? I might not be wording my question properly. But whenever you put in a hydrogen fueling station, is it just for a specific fleet or is it able to be utilized by all entities?

Dr. Petros Sofronis replied saying, my answer here would be that when you put a fueling station in place, it depends on whether it is directed, let's say to passenger fuel cell car or heavy-duty vehicle. It is not the same because the pressure that you need to dispense the hydrogen most likely will be different, the amounts of hydrogen that the passenger car will need are different from those heavy-duty truck need and so on and so forth. For instance, I know California right now is developing one fueling station for heavy duty trucks in Oakland. I don't remember the location, but they are developing right now a heavy-duty vehicle refueling station. Already they have about 50 for passenger vehicles, but they now focus attention on one for heavy duty trucks because the technology there most likely is different, as I said. So, they are specific to the application, their fueling stations.

Chad Parker added, so buses could not use the heavy transport and so on. So, is there a way to regulate this or make it where there is a better transition and a better usability of the infrastructure?

Dr. Petros Sofronis said, that is a good question, but I am not sure that I can answer it. This question I am assuming is beyond engineering and technology. This question has to do with the entire project. How we develop it? For instance, how we have the truck stops, for instance. Where the truck stops will be and those may be different from the refueling stations for passenger cars

when they come, let's say after 30/40 years. So, this has to do with the management of the entire system, I believe because I am assuming if you have a system to refuel heavy duty trucks, you can definitely include the technology that can refuel passenger cars. But I don't think at this stage we can answer this question because we don't have anything yet.

Senator Ellman said, just to want to alert everybody, John Horek and Bill have put in a lot of information in the chat and Aaron will be emailing the links to share as well. And this is a lot in regard to public transit of buses. So, really good information. I think this is really interesting information and the application for public transit is interesting. But for long distance freight hauling, I think is really interesting and particularly because it does cross state lines and requires a little bit of coordination and being aware of what's going on, at least to the east of us and hopefully to the west of us as well.

VI. Old Business

Senator Ellman mentioned that there was no old business to discuss at this time.

VII. Task Force Administrative Business: Annual Report

Senator Ellman mentioned from her chair report regarding that the annual report is due December 1st. There was a discussion about a week or so ago talking with some people and I would like to propose that we push out the publication of the report till mid-February because there is a lot of things that we do not know and some of that will actually become clearer within the next month or so. In particular 45V, the treasury department or IRS has been committed to releasing those rules before the end of this year. So, since that is forth coming of what is going to happen here in Illinois. So, I would like for us as a task force to know those rules before we before we draft and issue our report.

Letavish said earlier I know you said a little bit about what you were thinking of the perspective really focused on uncertainty. But is there a general sense of other than the uncertainty, what the key theme would be for now and then sort of what portion of that of the report is really think kind of solid from what we'd want to say right now and then what portion we think would be impacted, learning more information from the incoming administration over another month or two.

Senator Ellman replied by saying, "I think some of the topics that will certainly be within the report are the things that we've covered over the course of this past year. We did have a very good fact-based conversation about underground storage, and we've also talked about workforce, workforce activities, education activities so those would certainly be part of the report already and we already have a lot of material raw material for that report. But as far as going forward and making recommendations as we are required to do, I think a lot of that depends on those things that will come a little bit clearer to us in the next month or so, sometime before the year."

Dr. Petros Sofronis said, Senator I fully agree with what you just stated. I mean once we have some answers there, our reporting will be better and our recommendations will be stronger, I believe. Given that for instance, once funding is released for the hub, that will be important news for the

state and we can make recommendations as a hydrogen task force on how we can help the hub. Because as you might recall, one of the objectives of our hydrogen task force, out of the four that we had from the very beginning, was how this committee can help the hub. So, I believe waiting to see where the news is about the funding for phase I, it will be very important for our report.

Patrick Evans said, Senator. I agree. I think that waiting to see what the rules are going to be at the federal level. And I understand that we're uniquely positioned as a state that those rules could really change the trajectory of what happens in Illinois because of the real significance of our nuclear fleet here and how that may or may not play into the future of the hub. So, I agree, and I think as we all know, the legislative schedule, if you get something out in February there is still a lot of time to work on policy if we need to before the end of May. And I think it is going to be a very interesting year and there'll be plenty of opportunities.

Aaron McEvoy added Senator by me acting as kind of the administrator for the task force, I am going to put out a suggestion. I feel that since the governor's office requested the report at a certain date. If you all could take a vote of extending, this to sometime in February or something like that and make it an official vote, I would appreciate that so when I get a request from the governor's office I can share that with them.

Senator Ellman asked if there was a motion to allow us to set our new deadline for a report to mid-February?

Catherine Stashak moved to extend the report distribution till mid-February. Rep. Terra Costa Howard motioned. Dr. Petros Sofronis second. The motion passed unanimously by voice vote.

Aaron McEvoy added that Senator Ellman mentioned the next meeting since we have everyone here, do we want and this is the end of this year. Do we want to establish our next meeting? I am not saying all the meetings for 2025, but at least the next one in either January or February.

Senator Ellman said, let's do January so that we have a chance at drafting, providing a draft and discussion of the report prior to February. And then I'd like to meet also in February, or at least have there should be a lot of correspondence at least between now and January and then again in February.

Aaron McEvoy asked do we want to make it easy and just stay with the 2nd Tuesday of each one of those months or do we want to change it?

Chad Parker motioned that there be a meeting scheduled for Tuesday, January 14, 2025, at 8:30am. Rep. Terra Costa Howard second. The motion passed unanimously by voice vote.

Chad Parker motioned that there be a meeting scheduled for Tuesday, February 11, 2025, at 8:30am. Patrick Evans second. The motion passed unanimously by voice vote.

Senator Ellman asked if task force members as they get information that is available to the public, on

any of these on 45V or MachH2 funding, as long as it is public information, please alert us to that news.

VIII. Task Force Members information share

Dr. Michael Wang shared that with 45V, the Treasury has not released the final rule of 45V and Argonne has been working on a GREET version for 45V carbon intensity calculations of different production pathways. So, the first version was released in December 2023 is still the currently available version for people to examine the carbon intensity of different production technologies, and the DOE and the Treasury opened the so called provisional emission rate petition process. So, if there are some new technologies that are not included in the 45V version now stakeholders have opportunities to petition Treasury and the DOE on new technologies.

IX. MachH2 News

Senator Ellman stated that going forward, we are inviting somebody, we will be inviting somebody from MachH2. In fact, we did find somebody from MachH2 who will be presenting at future meetings. But there was no official news regarding MachH2 at this point.

Dr. Petros Sofronis added to invite BP with whom we are in contact. They are waiting before they start with their own technology there because they plan to produce hydrogen through Autothermal reforming (ATR), that is a technology that has not been applied for production of hydrogen and they somewhat are holding back. That is what the information that we have from them directly. They are holding back waiting for the funding to flow.

X. Audience Comment Period

Kristina Gentner said, did attend the conference about six weeks ago and I am very interested in what you are doing and I am dying to read the final report that's coming out in February. I've test driven a couple of different hydrogen vehicles. So, like the BMW prototype that was at the DOE conference, I think it was a year and a half ago or two years ago now. Went out to San Francisco and test drove a Hyundai Nexa and filled it up at the station down the street. So that was exciting for me, and I do invest in hydrogen equities in the stock market at times. So anyway, I really feel that hydrogen is the path for the future in terms of energy and climate change and integrating it is going to be is really going to be key. I do not know what I can do to help, but just sort of as an interested, an active consumer, I am here just listening to see where I might be able to contribute. I admire what this group is doing. I have one question about the presentation. I was just curious in terms of design for trucks and other vehicles, what, if a hydro... if a fuel cell EV, the hydrogen car emits water in the wintertime, what is done to sort of prevent sheets of ice forming on the road? Or maybe there is no problem because it is vapor, I do not really know. I was just curious if you have any comments about that.

Dr. Petros Sofronis added that what comes out in fact it is water droplets, I would say at high temperature. It is and as it comes out and it may be assumed that it must be freezing when it falls down. So, what is the effect? I don't think that we have studied it yet, but this is a good question to figure out. So, the temperature at which the water comes out is about 70 to 80 degrees Fahrenheit.

But it is going to evaporate quickly and immediately will be dispersed. The fuel cell vehicle will be moving, so I don't think that there is going to be a sheet of ice forming on the street. But that is a good question and we can look into that.

XI. Adjournment.

The adjournment of the meeting was motioned by Catherine Stashak. Second by Dr. Petros Sofronis at 9:40 am.

Future Meetings

- a) Tuesday, January 14, 2025 at 8:30 am
- b) Tuesday, February 11, 2025 at 8:30 am