

Rep Keith Ammon ([00:00:00](#)):

All right, everyone we'll call the meeting to order. Thanks for everyone joining online. This is the, the New Hampshire Commission to Study Nuclear Energy Technology. It has a much longer official name. We'll call the meeting to order at one, sorry. 9:05 AM. Alright. We have a new member filling in for Daniel Goldner. And Commissioner, would you like to introduce yourself?

Pradip Chattopadhyay, PUC ([00:00:33](#)):

Sure. I'm Pradip Chattopadhyay.

Rep Keith Ammon ([00:00:42](#)):

Okay. Okay. Very, very good.

Bart Fromuth ([00:00:46](#)):

Never get

Rep Keith Ammon ([00:00:48](#)):

<laugh>. Alright. Good morning, Dick.

([00:00:54](#)):

So, we'll just, we're going have a few minutes of commission business and then we'll be hearing from the American Nuclear Society. We have Craig Piercy, and he's on, on the line. And Craig, if you have any slides that you'd like to present, I'll make sure that you can share your screen. Welcome to everyone on Zoom. And we have some guests in the room here today, so we should have some lively discussions. So we're gonna start off by looking at the minutes for two previous meetings, March 6th and April 7th. And if you need a minute to, and we can always push this toward the end if you wanna have some time to review. All right. So let's start with March 6 minutes. Any, any changes or discussion and the way these minutes are generated now, just to give you an update, Mark is the secretary, but since we're recording the meetings, we can take the meeting transcript and run it through artificial intelligence and it generates the minutes for us. So, yeah, it seems a ton of time. All right. So I just accept the motion to accept the minutes from March 6th,

Rep Michael Harrington ([00:02:40](#)):

So moved.

Bart Fromuth ([00:02:41](#)):

Second.

Rep Keith Ammon ([00:02:42](#)):

All right. And all in favor? Any opposed? All right. Minutes of March 6th. Let's move on to April 7th. And this was our most recent meeting. We had BWX Technologies and we had X-energy present, so that, that was a really interesting meeting. The presentations from those are online. Welcome, David. Good morning. So we're just approving minutes April 7th. So the format's pretty much the same. We have the presentation, and then there's a Q&A section for both of those. And it covers the main points from both presentations. All right. Accept the motion to approve the minutes, April 7th. Cathy, second by Chris. All right. All in favor say aye. Aye. Aye. Any opposed? All right. All right. So we're done with that business.

We'll move right into our first guest, and I need to admit some people here. All right. And for those of you who just entered the Zoom were getting started with our first presentation. And Mr. Piercy thank you for your time and being willing to present to our group. I think we have some questions for the American Nuclear Society that we were talking about before our chat started. So,

Craig Piercy, ANS ([00:04:27](#)):

Good morning, everyone. my name is Craig Piercy, and I'm the Executive Director and CEO of the American Nuclear Society. And I'm pleased to present before the, the Study Commission this morning. So the ANS is serves as the Technical and Professional Society for the Applied Nuclear Science discipline. So we are a a 501c3 organization that supports a hold on one second here. Let me just close a window. supports a, a wide variety of services to our 10,000 members. we have meetings, publications, we publish technical journals. We have professional development activities. We administer the professional engineering exam for the Nuclear Energy Discipline. And in addition to the services we provide to our members we also provide some engagement with policy, what we're doing here today. We also work with journalists to ensure that their reporting of nuclear issues is done in a technically sound unbiased way.

([00:05:44](#)):

And we also are currently involved in a significant expansion of our activities to improve K-12 education programs related to nuclear science in the classroom. So again, pleasure to be here today. And I think my remarks are gonna probably be more general in nature as you, I can tell you've had you know, specific reactor vendors come and visit you and talk about their technologies. So I'm going to maybe zoom out a little bit more this morning and talk about the, the, the broader environment. And let me start by saying that as I think it's clear to anyone who is paying attention to the nuclear field nuclear energy is kind of having a moment right now. And, you know, you can see it in, in popular culture really just in the last couple of weeks.

([00:06:39](#)):

I was at the premiere of the movie Nuclear Now last week in Washington, DC. I actually saw it on your agenda this morning to, to discuss it, but I mean, it, it, it really is sort of a, a a very well put together scientific and technical case for the expansion of nuclear energy. We've also seen just in the, in the last 24 hours, the the grandson of Robert Oppenheimer writing an opinion piece in Time Magazine that talks about, you know, nuclear's time has come. And of course, Elon Musk jumped on that pretty much immediately and tweeted his support for nuclear energy. So we're, you know, we're definitely seeing a change here. And we think that that change is is, is fairly durable. Now, you know, some of you may remember, 15 or 20 years ago, there was a, a so-called nuclear renaissance where we were going to build large generation three plus lightwater plants around the country.

([00:07:50](#)):

I think there were as many as 28 reactors that were were submitted to the NRC for licensing or permitting. And, but you know, of that May two of them were are being brought to completion. One of 'em, you know, both of those in in the Vogtle plant in Georgia, the first one has come up online and, and reach criticality and has started de delivering power to the grid, I think maybe two months ago. And then the other one, we expect to be online by the end of the year. So and what we're experiencing today, I wouldn't describe as a nuclear renaissance. It's more of a nuclear enlightenment where I think people individually are beginning to look at the hard math of climate and, and decarbonization trying to understand how we're going to maintain a reliable and resilient grid when we have an increased penetration of intermittent renewable sources of energy.

[\(00:08:56\)](#):

And I think that is, is, you know, calling into you know, calling for all of us to really think about energy differently. You know, nuclear is the only proven source of clean firm energy generation. Yes, there are others that could be in the offing, like carbon sequestration. But in terms of the you know, the, the, the technological risks of, of scaling up a new generation of technology, nuclear actually has the most proven system in an existing supply chain. And again, I think the challenge here is when you get to 50 to, you know, probably beyond 50% renewable penetration into the grid you have some you know, some fundamental weaknesses and instability in the grid that, that only a firm dispatchable source of clean not emitting electricity can mitigate in a carbon constrained world.

[\(00:10:03\)](#):

So again, you know, we're, we're, we're trying to figure out how in the long-term society is gonna deeply decarbonize, but also maintain our standards of living. Most of the improvements in our lives we see today is supported and enabled by the provision of reliable electricity. Every one of these requires a refrigerator worth of energy to power the, the, the servers and the other information infrastructure required to provide us the, the data and the, the media and the TikTok and, and all the other things that that we use that we use today. So we have seen a positive change in public opinion and that is fairly substantiated by recent polling. Gallup does an annual survey of public attitudes on nuclear energy. They release their 2022 numbers. About a month ago we saw a four point increase in overall support or nuclear energy where, you know, when you put that in the perspective with other recent public opinion polls, we're seeing the largest increases in support coming traditionally from the traditional left side of the political spectrum as more and more people confront the challenging math of how we decarbonize.

[\(00:11:36\)](#):

And, and so we're definitely seeing improvements there. you know, there's still pockets of skepticism and outright opposition. But you, you see it generally existing primarily in an older demographic, that grew up in the time of nuclear weapons, the duck and cover generation, if you will. And, and really seeing you know, but seeing significant changes with, with the younger generation, really seeing now climate as the existential threat. And you know, a nuclear being a solution to that has really changed the calculus. And I would, I would point out to the commission Congresswoman Alexandria Ocasio-Cortez traveled to Fukushima earlier this year, and took a, a radiation dose of roughly two x-rays. While she was there. She chronicled her journey on Instagram. And, and, you know, her, her takeaway quote from her travels, there was, quote, "For me, understanding and studying the science and scale of radiation puts me more at ease, more information, makes me feel better."

[\(00:12:51\)](#):

And I think that's kind of emblematic of the sorts of journeys that people are going through individually on this topic. So you know, let's sort of move on to, again, we see historic investments at historic public investments in the, the scale up of new technologies. The combination of the Inflation Reduction Act and the the Infrastructure and Jobs Act, the infrastructure bill has probably devoted roughly somewhere between 40 to 50 billion worth of worth of nuclear eligible funding. That includes the Advanced Reactor Demonstration Program. It includes tax credits for the production of hydrogen and additional tax credits for replacing fossil plants. So certainly the and in addition to tax credits to supporting the existing nuclear fleet here in the us. So we've seen pretty much the end of the, the, the closure area when it comes to the existing fleet punctuated by the, the state of California's turnaround on the Diablo Canyon nuclear plant.

[\(00:14:11\)](#):

And again, we're seeing the development of new technology and really new choices in, in nuclear technology choices that, that, that weren't available 10 years ago. So you know, you have a host of, of Generation three plus lightwater plants the GEs, BWRX 300, Westinghouse has just announced a new plant, NuScale has been working on, on their plant. Their, their, they have a license approval by the the Nuclear Regulatory Commission. You know, those plants use existing light water technology. They use existing fuel forms, but they they have much fewer moving parts. They rely on natural convection for cooling. They you know, they if you think about the the sort of the safety case, you know, it's a kind of thing where you can literally, you know, you could walk out the door for, for days, you know, days or even weeks and, and not have to have any kind of operator intervention in the, in the in the case of a, a full station blackout.

[\(00:15:25\)](#):

So you know, some exciting choices there that rely on the, the existing fuel structure or fuel supply chain. then of course you have high temperature gas reactors, pebble bed reactors that are good both for electricity and for processed heat. I know you had X-energy in earlier. But you know, but really a very sort of conceptually simple design, almost like a giant gumball machine. and and so, you know, we're seeing X-energy moving forward in the design of their plants. We're seeing Natrium out in Bill Gates was just out in Wyoming this week to sort of formally announce the location of that, that plant. You know, the, the Natrium plant really serves not only as energy generation, but really as a **grid anchor with molten salt heat storage** that can be then converted into electricity and brought out to a grid at a time when, when that grid's, renewable resources aren't delivering the power necessary to meet demand.

[\(00:16:32\)](#):

And then finally, you're seeing you know, other interesting designs, the Kairos reactor, we see heat pipe reactors that are, that are really in a way almost no moving parts and really nuclear batteries that are optimized for remote locations, long refueling intervals, not, you know, we're talking in, at least in the, in the near term about sort of single megawatt levels of energy, but very low operator intervention. You know, really thinking of it more like a battery system than than a reactor in, in the classic sense. And then, and then finally you have fusion energy and, and fusion. You know, there's been a lot of excitement around fusion. We saw the the Department of Energy's national Ignition facility, a facility that was originally created to you know, to generate science on, on nuclear weapons post the nuclear test ban treaty.

[\(00:17:39\)](#):

But you know, has been used in, in what was the first net energy out experiment that we've seen a successful experiment we've seen. So a lot of excitement about fusion. I think you have to, you know, **be a little careful about hype in this area**. I definitely think, you know, the old joke about fusion is that it's all it's only 50 years away. It doesn't depend on what year you're in, but we do see fusion getting closer. the, the announcement yesterday is, is a **power purchase agreement between a fir a fusion energy developer and Microsoft**. The Fusion energy developer is hoping to have its reactor operational by 2028. But again I think you know, in terms of the, the commissions thinking about this, probably need to extend the timeframe out a little bit longer.

[\(00:18:34\)](#):

A lot of people that I've spoken to that, that are experts in this particular area suggest more you know, 2035 to 2040 as sort of the first sort of significant commercial implementation of it. And there's still a lot of risk in those dates, too. So we're excited about fusion, and I think most of, of the people in our society think that that, you know, at some point in the long-term fusion really will take over from Fision. But we're talking about decades here. And, and the analogy I would use is that, you know, the, the, the jet

engine was invented in the 1930s. It didn't really see wide scale implementation in commercial transportation until the late 1950s. And we still see today that, that there are aircrafts of all sizes that are still being produced today with propeller driven engines.

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And so it, it's not so much to look at it as an either or situation. It's more to look at it as "horses for courses." When it comes to nuclear, obviously there are, there are challenges that, that the community has to the nuclear community needs to engage in the next few years in order to ensure that we can have a, a scale up of, of new technologies and new generation in the 2030 timeframe. **Fuel is probably the most urgent challenge at this point.** we have really sort of two different elements to it. One is, is the current low enriched uranium that we need to power our current reactor fleet. There are we receive roughly 20% of our enriched uranium from Russia at the moment. There's no suggestion that Russia has any intention of cutting off that supply, but there are concerns about our continued reliance on, on Russian enriched uranium.

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So we are seeing you know, we have one domestically located commercial enrichment facility in the US now in New Mexico, run by Urenco USA. We also have Centrus, which is a US owned company that is developing enrichment technology that would be deployed in Ohio. And then you have a consortium looking at a new form of enrichment called laser enrichment that there is a pilot plant in North Carolina now. **Laser enrichment - the technology's been around since the 1970s, but I think we're finally going to see commercial implementation of that here in the next few years, really has the promise to, to cut the the cost of enrichment.** So, again, I think we're, we're there is no LEU uranium shortage at this point, policy discussions in Washington DC about reducing and ultimately eliminating our our reliance on Russia.

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But again, not a, you know, not an immediate concern. Then there's the, what we call the High Assay LEU. So if you think of LEU for the existing fleet as your, your you know, your Budweiser, this would be your, your HALEU would be more like your Imperial IPA, if you will. **We don't have currently commercial production capacity for HALEU, but we've seen a a nine figure investment by the federal government with more on the way here in the coming years to start up a, a domestic supply chain for highly high assay, low enriched uranium.** Again, all of the, the, the most of the generation four designs that I know you've been considering require enrichments of higher than 5%, somewhere between five and 20. So you know, from a technological standpoint, it's not a difficult thing.

[\(00:22:42\)](#):

We've been doing it for years. **The challenge here is really how do you incubate a, a a, a private commercial market for that fuel?** And and I think we're gonna see more from the federal government in terms of being a lead customer for HALEU, being able to, much like the federal government purchases oil for the strategic petroleum reserve, we see them having a role as being a, a, a lead customer for for HALEU enrichment. So from the fuel, you know, from the fuel challenge, it is a challenge. And, and if we don't move with alacrity in the next few years, that could hold back the deployment of new technologies. But again, no technological showstoppers there. It relies more on just on, on, on government and industry getting together to help kickstart and, and you know, and fuel a startup of that technology.

[\(00:23:40\)](#):

You've probably heard a lot of discussion about the, the US Nuclear Regulatory Commission and, and their readiness to license and regulate advanced reactors. I think that like any other federal administration the NRC has its share of challenges in terms of its ability to move with alacrity. but I do think that some much of the criticism of NRC is perhaps a little unfair because they have not, they have not yet received, you know, there, there is this going to be this bow wave of, of license applications that come to NRC. NRC has committed to be ready for that. That bow wave hasn't fully hit yet. So to be able to judge NRC's performance on regulation before the season started as sort of, you know, like you know, judging your favorite NFL football team based on the preseason results.

(00:24:49):

So I think that, that from a regulatory standpoint their, the, the first reactors will be licensed by the NRC through their existing process that's optimized for lightwater reactors, but, but can be made to fit advanced reactors with the right set of exemptions. And then ultimately the goal is for NRC to get a technology neutral licensing framework in place. You know, there've been some difficulties there, but I, I think that you know, again, it's not critical path at this point. I would say fuel is probably the, the, the bigger issue when it comes to matter, you know, other challenges, obviously nuclear waste is one that's brought up, that's probably from a technical standpoint, the least of all the challenges. You know, we see you know, in a way the, our nuclear, our challenges in nuclear waste policy issues suffer from the fact that nuclear waste is so safe.

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And where it is right now, whether it's in a fuel pool or in, in dry cast storage, that it's not driving changes to policy because we know that those dry casts can, can have lifetimes of, of or can be licensed for a hundred years or more. And and so I think there is an increasing appreciation for the, the energy that exists in those fuel rods. We don't necessarily have a commercial system in place to be able to extract the value out of that now. And certainly you know, we're not going to create multi-billion dollar government run facilities to do that. But we've seen a number of private companies that have been interested in extracting usable uranium out of those fuel rods. And I think that that interest will only grow in, in the years ahead as you know, our need for additional you know, sile material and and nuclear fuel continues to grow.

(00:27:06):

So you know, and then we have, we have the, the attendant issues of being able to grow our domestic supply chain. If you, you know, I've probably talked to 20 nuclear industry CEOs in the last six months, I always ask in the same question, what keeps them up at night? And the answer is pretty much uniform. It's, it's the, the challenge of being able to hire the right number and the right skilled people for the job. And I think that, that, I know that's something that isn't, isn't necessarily limited just to the nuclear industry, but I think that we are, are you know, the challenge here is building a workforce. And that's really where a and s and our organization is is leaning in. So we are expanding our programs, both in terms of education and K-12 classrooms, but we're also developing certification programs that are designed at bringing skilled professionals from adjacent industries over into nuclear, give them the knowledge that they need to be able to, to work effectively in that industry.

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Even if they bring another skill, if they're a mechanical or an electrical or civil engineer, to be able to understand the licensing process, understand the basics of the science we're, we're hard at work beginning to scale up those programs. So I, I think that, that, you know, our our outlook is that the we will see a commercial scale up of advanced technologies in the 2030 timeframe that is going to require order books that are starting to fill up here in the next two to three years. It's gonna require action to

provide additional HALEU to make available for those reactors. We expect the, that we'll see end of a kind pricing in those sorts of reactors to be in the mid 2030s. And, and so, you know, once you've built the first few, you've brought the per unit cost down.

(00:29:17):

Again, the goal here, you know, our, our nuclear program to date has been, you know, we're building airports, right? One, one of a kind, very large civil construction projects that, that tend to run over budget and over schedule. And what we're trying to do is instead of building airports, we're building airplanes where those you know, those systems are, are rolling off a factory line with the, the, you know, having all of your skilled labor in one place, in a manufacturing setting, having better QA and QC to prevent problems on the job site and again, lowering that, that unit cost. So you know, I think for, if, if I'll sort of close by saying, I think that, that the, the, the challenge for the commission is to, is to kind of understand where the you know, where the goldilock zone is for, for a state that is thinking about whether or not new nuclear generation is right for them.

(00:30:19):

Because on, you know, on the one hand being at the leading edge, you know, creates risks, right? It creates financial risks it creates political risks. There are, there are a whole, you know, implementation risk, project risks, but but, but being too late to the game could mean that you're at the back of the line. And, and, and, you know, and at the mercy of the fundamental limitations of the, the supply chain and the production capacity going forward, if, if there are others in front of you. So I suspect that's probably you know, your challenge, obviously, you have Seabrook Station that is, is licensed to 2050 providing 40% of your electricity, so you're not starting from go. But but you know, again, I think ultimately I don't want to get too promotional in terms of nuclear energy, but if you are thinking, you know, if states are thinking about the future, thinking about how to create a reliable and resilient grid with high penetrations of intermittent clean energy it, it's gonna require an anchor. And, and the, the best anchor out there, if you were to look at it just from a technological deployment feasibility standpoint is nuclear energy. So so with that, I'll, I'll, I'll conclude my remarks. I, I appreciate the time and, and I'm happy to answer any questions that the commission members may have. Thank you.

Rep Keith Ammon (00:31:52):

Great. Thank you, Mr. Piercy. I just found out that our next speaker has a hard stop at 10 o'clock. So would, would you mind, I don't know, sorry to impose on your time schedule, but would you mind sticking around and we'll, we'll do the QA for your talk after 10. Is that okay with you?

Craig Piercy, ANS (00:32:10):

I'm happy to do that. I've got a hard stop at 10:30, but I think it'll work.

Rep Keith Ammon (00:32:14):

Okay. That, that sounds perfect. All right. Thank you very much. And we'll, we'll we'll come back to you and if you could hold your questions and,

Gareth Thomas, Holtec (00:32:39):

All right, Keith? Yeah. Do you want me to, to just fire away?

Rep Keith Ammon (00:32:50):

Fire away.

Gareth Thomas, Holtec ([00:32:51](#)):

Alright. Okay. Didn't know. Sorry. So good afternoon or good morning. My name's Gareth Thomas. I am senior program manager for Holtec. I'm actually talking to you today from London or, or just outside. It's quite rainy and miserable, so that's probably a giveaway. So I've been with Holtec since around 2014 split time between US and UK as we started to expand our operations. And more recently in the last few years I've been focusing on the SMR development and we can talk about that. And so we, I, I think really the premise of this is just to give you kind of the technology developers point of view and kind of the, the road ahead that we have and the challenges that we face.

([00:33:51](#)):

You know, Craig has given you a really holistic overview of, of the industry and, and it's actually quite interesting. But yeah, our challenges are quite narrow and on focused on the short term. So a bit about Holtec for those, you know, if you're not in the nuclear industry, you've probably not heard of us. To be fair, we started in 1986. We're a technology development company. Our owner and CEO is, is the same person who founded the company. He's, he's a bit of a technical genius. He started off in heat exchanges and plant equipment and then moved into, spent nuclear fuel because there was a growing need to solve the storage of the fuel. So we first started doing underwater racks and high density racks in, in the, in the fuel pools. And then we started moving into dry gas storage as the industry did the same thing and realized that, you know, we couldn't store the entire plants, spent fuel in the pool and we had to put it out into a safe, stable state on the reactor sites.

([00:35:12](#)):

So we've been doing that and that's really been our core business for about I'd say 20, 15 years, let's say 15 to 20 years. And then in the last five years we, we started moving into reactor decommissioning and, and SMR at the same time. SMR 160 program for us started in 2010. We started just before Fukushima happened and, and probably questioned why we were doing it after that. But our owner was, was very passionate about designing a reactor, which was what, what we call fail safe or walk away safe. And I use that with some hesitancy because <laugh>, cause we don't want to give the idea that we're just gonna walk away from this thing. But really we were trying to develop a reactor, which, which was inherently safe by design, but we wanted to use existing technology and, and, and develop a reactor in the existing framework.

([00:36:19](#)):

So we, as a few others have done, came up with a novel rethink of, of existing technology, which is for us, the pressurized water reactor or, or light water reactors. And so what we've designed is 160 megawatt electrical PWR pressurized water reactor which is being configured for either single unit or multiple units on one site. And we've been designing that pretty much since 2010, but we've really ramped up in the last few years. So in around 2018, we, we went through the Canadian VDR phase one and we completed that. And then around the same time was completing that we got awarded a DOE fund. So we were awarded under the Advanced Reactor Demonstration Program under the Risk Reduction Pathway. So some reactor developers are under that program developing a full demonstration unit. We're, we're just going up to the point of developing the licensing documentation and being ready to submit a construction permit application.

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And so right now we are, you know, really midway through that program and we're finishing up the first issue of our Preliminary Safety Analysis Report at the end of this year and getting ready to submit a

Construction Permit Application towards the end of next year. And we are looking to, to license the first reactor under the two-part 10 CFR part 50 process, which is the, you know, the standard process that is being used to, to build about over 95% of the existing fleet in the US. But under that process we would submit a construction permit application. And then really the detailed review from the NRC begins up until now we're doing regulator engagement, like free application engagement with the NRC which is really, you know, routine engagement on key issues just to get their feedback and is, and, and make sure that when that construction permit application is received, it's not, there's no surprises.

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So we're going ahead with that. and really our, our next challenge is to figure out where that first plant will be. Obviously we're not just, you know, designing this technology and making a lot of paperwork, right? We want to do projects. So Holtec is, is really a project company. We, we manufacture and deliver equipment on people's sites and, and in some cases we provide people to operate and maintain our equipment. So we, our, our next challenge really will be to try and re try and refine and, and basically frame that first commercial project. So we have existing nuclear sites in the US that we are decommissioning which Holtec is acquired. And one of those sites is the Oyster Creek site in New Jersey. And that at the moment is the most likely candidate for the first SMR project by Holtec. So we're progressing with that site in mind.

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We would, in that model, we would actually build the plant ourselves and then hand it over to an operator once it's, once it's basically commissioned and ready for operation. So that site is currently under decommissioning by, by a Holtec subsidiary company. but the decommissioning will enable the, the required site to be cleared in time for construction to commence. And that construction would start around 2027 to enable operation, commercial operation by the end of 2030. So that's the schedule that we're working to at this time. Now obviously the, the, I guess the challenges for us are to try and ensure that we have a commercial project. So really thinking about power purchase agreements and ensuring that the price for electricity will be sufficient to make a profit. And the Inflation Reduction Act has really helped in that regard, because it has provided, you know, really some, some significant help towards, you know, these projects, especially nuclear.

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But it's, it is always a challenge, especially in the unregulated markets and New Jersey, you know, has always had like a competitive, stable, quite competitive power price. So, you know, these are the challenges that we are working through at the moment. Other sites are, are obviously under consideration either through our existing sites that Holtec owns. And we're also starting more detailed discussions this year with, with other utilities basically towards the south of the US where there are more regulated markets. And some of these nuclear utilities with, with strong balance sheets are starting to think about SMRs and, and again, it's, you know, the challenge is, who wants to be first, right? It's first of a kind risk to, although we're building light water reactors, it will be the first time that we've built this specific design of plant. And the nuclear industry has historically had issues keeping on time and on budget when it comes to first, first times that they've built specific designs.

[\(00:42:55\)](#):

So we're doing a lot of work right now with our construction partners. So we've partnered with Kiewit in the US who are a established construction company who have done many power plants over the years and, and typically for fixed price and really trying to work through with them the details of the plant and get the design to an executable status so that we can really have confidence in our cost estimates. Because when we go forward with a commercial project, we really have to have high confidence in the

budget. You know, like I said, we, we really need to be for the, for the first plant, you know, on, on the budget, whatever that is. And we are obviously ensuring that it is competitive and will be worth constructing. The next challenge is then how do you bring that cost down over time and, and get to end of the kind and then how quickly can you do that? So you can really try and realize your, your, your benefits of reducing cost. So, you know, you know, we'll, we'll we'll be working through that as we, as we take on more orders. So I think that's generally like everything I wanted to whizz through. I think maybe I could stop and we have like 10 minutes of questions that you may have for me. Maybe I've been a bit too high level, but, but let's see if you have any questions then we can go into it.

Rep Keith Ammon ([00:44:33](#)):

Alright, thank you. We have one question in the room representative Mike Harrington. There's a mic on that side.

Rep Michael Harrington ([00:44:43](#)):

Thank you. Can you hear me?

Gareth Thomas, Holtec ([00:44:45](#)):

I can, yeah.

Rep Michael Harrington ([00:44:46](#)):

It's actually a two part question starting with two part why the two-part licensing rather than going with the combined license like Vogtle did? Is it because of Vogtle that you're staying away from that, or it seems to be kind of a step backwards?

Gareth Thomas, Holtec ([00:45:00](#)):

Yeah, so it, it's a good question. So the, the, the combined construction and operating license is sometimes not as sweet as it sounds. So what they found at Vogtle was you, they certified the design and then it was quite tricky to actually make design changes drawing construction. Because inevitably there are small things here and there as the, as you construct the design for the first time and they had to go, then they had to go back to the NRC and have those changes approved. And that process was quite cumbersome and, and, and it led to some delays during construction, you know, stop, stop.

Rep Michael Harrington ([00:45:42](#)):

So you start going back to the two part was worthwhile. And the the second thing you, you mentioned building the plant, I'm assuming you'd get PPAs. So the risk associated with the construction costs would be born by Holtec. In other words, you'd go out and negotiate a price for your, your, your PPAs with a utility and then you'd build it. And if you were 20% cost overrun and delays or 20% under you would either reap the benefits or suffer the consequences.

Gareth Thomas, Holtec ([00:46:11](#)):

Yeah. In that model that I presented on or discussed on Oyster Creek Yeah. In that

Rep Michael Harrington ([00:46:16](#)):

A thousand questions about that, but I'll only ask one. Yeah.

Gareth Thomas, Holtec ([00:46:19](#)):

But in that model, yeah, we would be liable, right? So we would get the, that's,

Rep Michael Harrington ([00:46:23](#)):

That's a huge quantum change in the way nuclear plants are built. That's enormous change. I'll have to try to follow up with you sometime on that. Someone else had a question here.

Gareth Thomas, Holtec ([00:46:34](#)):

Yeah. Look, don't get me wrong by only, like, we would prefer to obviously go to a owner operator and have, and have some kind of risk sharing approach. But right now there's not too many r owner operators in the US who are putting up their hands and saying, yeah, we're willing to build a first we find SMR, you know, let's get into it, right? So we're all, we are evaluating those and there are several this year that are really starting to get detailed about, you know, talking to us and asking for actual proposals. But in the meantime, you know, if, if those stall then we've got this Oyster Creek project, which we are willing to go ahead.

Rep Michael Harrington ([00:47:16](#)):

Yeah, it's interesting cause New Hampshire is a merchant plant as well. So [that would be the model that would have to be used here](#) if we were to go forward. So

Rep Keith Ammon ([00:47:29](#)):

Gareth, you mentioned, this is Keith. Gareth, you mentioned the Inflation Reduction Act and o and other recent federal programs. Could you just explain to us how you are interfacing with those programs or, you know, what is the what is the, the connection that Holtec can make with you know, the recent changes federally?

Gareth Thomas, Holtec ([00:47:50](#)):

Yeah, I'll give you a very brief kinda overview from what I've heard. Cause I really am not the expert, but I'm happy to, if you have my contact details, I'll get it from Keith and happy to connect you with the relevant person in Holtec. But for us, it was really, you know, it's really trying to realize exactly what it means for us in terms of dollars per megawatt hour. So you have like the tax credit and it's, we've been working through it and I think a lot of us have, you know, spent a lot of time digesting it. Obviously, like I said, I'm not the expert, but it kind of got to a point where we were trying, we were kind of adding up all of the things that the IRA gave us. And it, and again, don't quote me, but it was getting from, you know, the fact that New Jersey was like \$45 megawatt hour, but with, with the Inflation Reduction Act and all of the, of the credits, it could get you more like \$80 or \$90 a megawatt hour. So, you know, again, I'll take a question offline and, and please reach out to me and, and I can try and give you a more detailed answer or connect you to the right person. But it was really, but when we stacked it all up, it made, you know, for that first of a kind plant, it really did help us to get us a much more realistic LCOE, you know, make it make it much more worthwhile.

Rep Keith Ammon ([00:49:16](#)):

Great. Thank you for that answer. Any other questions in the room? if you're online, you have a question, raise your hand using the Zoom feature. Good. You have a recent project in New Mexico that was approved for temporary storage of of nuclear waste. So you Holtec is expert on handling nuclear

waste. That's a thing that comes up often in our commission here, that what do we do with the spent fuel. So do you have any any words to say about that?

Gareth Thomas, Holtec ([00:49:50](#)):

Well, yeah, I mean, you know, it's something our owner has been very passionate about. and if you think about it, it doesn't really make sense to be storing all of the high highly active spent nuclear fuel at, you know, dozens of nuclear sites all across the country. Why not consolidate and bring all of that to one location? And as then as we start to decommission some of the sites, you can completely release the site for redevelopment or, or just, you know, just basically leave it and you don't have to manage all of these dozens of nuclear sites if they do start to decommission. So for us, it made a lot of sense to license a central facility not only to offer our existing clients the option of moving their fuel to our central facility. So a great example is, is the Californians who, who do want to exit nuclear.

([00:50:51](#)):

So, you know, for example, San Onofre Nuclear Generating Station (SONGS) could be a prime candidate, right? Where they could then just ship the canister that they have from California to New Mexico and then completely get out of nuclear. But second of all, for the sites that we start to acquire and decommission again, you know, it, it will allow us to move the fuel to that central facility so that we can release the site that we own or redevelop it for an SMR. So, you know, we've finally got the license now, and I think the, I'm not directly connected with the team involved, but the, the first thing will, will be to decide who's gonna be the first customer, and then that will then drive, okay, when are we really gonna start construction? But there is a business need and it's just a case of how getting, getting things off the ground.

Rep Keith Ammon ([00:51:50](#)):

Right. Great. Just looking around the room. Anybody have any questions for Holtec before we let him go? All set. All right, Garrett, thank you very much. And I know Patrick was Patrick. Yeah,

Gareth Thomas, Holtec ([00:52:02](#)):

Thank you. I appreciate you switching the times and, and and Craig for his patience, so thank you very much. Good.

Rep Keith Ammon ([00:52:10](#)):

And you know what, the weather here is pretty much the same where you are. So

Gareth Thomas, Holtec ([00:52:15](#)):

London stand set up.

Rep Keith Ammon ([00:52:22](#)):

Thank you Gareth, we really appreciate and we'll reach out for further questions.

Gareth Thomas, Holtec ([00:52:26](#)):

All right. Happy to help. Thank you.

Rep Keith Ammon ([00:52:29](#)):

Very good. All right, and Craig, we're back with you. I know I have some questions for you too, Craig. Let's see. Trying to make you the spotlight here somehow. It's not showing up on my menu. No, we'll just have to go with that. I see one question on Zoom here we go. Timothy Smyth, would you unmute and then go ahead with your question?

Timothy Smyth (public) ([00:53:04](#)):

Yes. This is maybe more for the committee even than than for Craig. but something,

Rep Keith Ammon ([00:53:11](#)):

Why don't we save that question towards the end then. Oh,

Timothy Smyth (public) ([00:53:13](#)):

Okay. Alright, that's fine.

Rep Keith Ammon ([00:53:15](#)):

Alright, thank you. All right. We have some questions in the room. I'm gonna actually, there's a mic there. Would you mind passing that around? Just whoever you, Representative Thomas, as long as there's a green light, as long as green's on, as long as the green's on, you're good to go green's on, so you can, yeah, just green's on talking <laugh>. Yes.

Rep Doug Thomas ([00:53:39](#)):

That'd be easier. It it would be easier, yes. yes. Mr. Piercy, Doug Thomas here I sit on my I'm the Vice Chair of our Science, Tech and Energy Committee here in New Hampshire. But I was very intrigued and pleased to hear you address so forcefully the importance of public opinion and turning the the old concepts around. And your statement on that you were introducing into the K-12 instruction. My question is, how, how do you intend to introduce this to all of the states schools in, in terms of what you want them to learn?

Craig Piercy, ANS ([00:54:24](#)):

Yeah. So a little bit of, a little bit of background. So we about two well now, gosh, it's been almost four years ago now. We we, we partnered with the Department of Energy, the US Department of Energy and, and Discovery Education to develop a a K-12 curriculum modules for elementary middle school and high school specifically on the basics of nuclear science. And, and so that curriculum exists today. It's part of our Navigating Nuclear program, which you can find on our website ans.org. So all of those resources for teachers are available now and, and all of those are all of that curricula is aligned with next Generation Science standards. So again, every state is different and, and, you know, it is a you know, there are state specific requirements and policies that that could, you know, potentially impact the way this gets taught in the classroom.

([00:55:33](#)):

But, but where we want to go now is now that we have the curriculum, is really be able to significantly increase the resources that we have to, to bring to teachers to appropriately teach the subject matter. So there are really two facets to that. One is the, the sort of the physical materials. How can we get you know, Geiger counters in the classrooms? How do we teach teachers to build a a cloud chamber where you can actually see nuclear reactions. It's pretty simple, you know, some dry ice and in the right light. So what, what our goal is here in the next couple of years is to be able to serve individual teachers that

contact us anywhere in the United States and say, I want to, you know, I, I want to teach a module in in nuclear science that that aligns with with what our, our standards are.

(00:56:36):

So you know, again, most of the materials we have are, are are two-way, right? You, you know, we send them to the teacher and then the teacher uses them and then they send them back, you know, the but we, we we're getting funds to be able to create a one-way box where it can, you know, every teacher that requests one, we can send them. So that's kind of our near term. So we're kind of combining our existing curriculum with additional resources for classrooms. The other the other aspect, there are two other aspects to it that, that exist in our STEM academy. One is the notion of having nuclear ambassadors are people from the community that are trained to present in a classroom where a teacher can call in a professional and teach five periods of AP environmental sciences.

(00:57:26):

And then the other one is our Pathways to Nuclear program, where in the course of, of this classroom engagement, there may be students that express particular interest in pursuing additional information or study about it. And we're able to give them the kind of resources that, that they need you know, to to, to support their interests. And, and, you know, again, this is, this, you know, integrates with what we see overall as probably the largest single challenge in, in, in the nuclear industry now is, is how do we significantly expand the workforce in order to accommodate this deployment of new technology. So, again, it's a long game. but we are we've been receiving some corporate funding, some additional federal funding and and, you know, happy to sort of talk with you more. We've just hired a new director of our STEM academy, and I, I would love to you know, I'm sure he would love to have some additional conversations here to see whether or not there, there's some, some specific opportunities for us to assist schools in New Hampshire.

Rep Keith Ammon (00:58:46):

Thank you. I would like that. and so just to clarify, then, it, it really depends on what the state's education policy is on curriculum as to whether or not teachers will be encouraged to seek out that information.

Craig Piercy, ANS (00:59:00):

That, that's correct. And I, I, and I think for us as a, as a scientific and professional society, our, our focus now is, is, you know, is the materials and training for teachers. But I think ultimately, if we're going to be successful, I think it is gonna require engagement at the state level to ensure that, that you know, standards aligned lessons can be taught. They're encouraged to be taught to the extent practicable and we're, you know, we're not as an organization, not quite there yet, but, but we, you know, we're happy to work with you know, anyone who has some ideas in that area. So happy to connect offline. If you have my email address, if you could just send me an email, I'll forward it to our, our main K-12 person, and we could, we could explore how we might work together.

Rep Keith Ammon (00:59:50):

Thank you. I just have a follow up question on that. We have Christopher McLarnon, if I could spotlight you, Chris, and he teaches nuclear physics at UNH, university of New Hampshire. And thinking, thinking ahead to like workforce development do you have programs that engage with, you know, at the university level that we could maybe plug into?

Craig Piercy, ANS ([01:00:15](#)):

So if that, if that question is for me, so we, we so when we do not our, our specific work in curriculum development really ends at, at at the high school level. But the other thing that I mentioned in my, in my opening remarks is that we are working on a set of certification activities for professionals that are interested in, in shifting over into the nuclear field to, you know, help them get the basic knowledge that they need of nuclear, the regulatory system, reactor operations, the fuel cycle, radiation, and radioactivity. Just some of the basic competencies that you would need to be able to understand industry. Our, our goal at this point I'm actually we'll be meeting with our, our our study group on this here at about 45 minutes. But our goal is to is to get something up and running I'll call it a "certified nuclear professional program."

([01:01:20](#)):

So again, it, you know, we have, we have a, a, a growing set of nuclear engineering departments around the country, programs at universities, even if there's not a full fledged nuclear engineering or technology program. and so we're, we're seeing growth in that area. We're seeing growth in the number of enrollees. We think that that the universities are really best positioned to help serve that particular, you know, part of the education spectrum. Our focus is really on, on, you know, if you have an electrical engineer, you know, we've, we've we've seen people that have been working in the defense industry on, on digital instrumentation and controls for fighter aircraft that we wanna bring over to work on digital instrumentation and controls for nuclear plants. They've got the, the relevant experience in that field, but they don't have an understanding the broader industry in which they would be working. And so that's really where we're focused on, is giving them that, that, that basic body of knowledge so they can come in, apply their skill and expertise in, in our field.

Rep Keith Ammon ([01:02:32](#)):

All right, great. And Chris.

Christopher McLarnon, UNH ([01:02:35](#)):

Craig, this is Chris McLarnon. talk about the programs for the university, but one of the big issues is going to be the tradespeople necessary to build these plants. We've seen that with Vogtle and the issues they've had with welding, et cetera. Are you addressing that area at all?

Craig Piercy, ANS ([01:02:54](#)):

Yeah, so we're very I would say that we're very aware of it where ANS tends to come in as maybe a little bit, we're, we're sort of a little bit higher than, than what I would call the skilled trades focus. but there are others, you know, we work closely with our partners at the Nuclear Energy Institute and also the, the Nuclear Regulatory Commission and DOE have both supported programs at two year institutions to help increase the supply of qualified workers. But you're right, I mean, that, that is the challenge now. You know, the other hope of of moving from airports to airplanes is that, that you're able to more effectively harness the labor force that we have now, right? So instead of having itinerant welders and pipe fitters that move from plant site to plant site, that, you know, you can put more of them in a, in a, in a factory or manufacturing type environment where where they're not moving around, where you can, you know, you can move into a community and raise a family and have, and have a, a, a well paying job.

([01:04:04](#)):

So you know, our hope is that, that the combination of the expansion of that workforce and a change in the, in the model of production is, is gonna create greater efficiency. But again, you know, I think we can talk about, you know, challenges in the, in the nuclear industry, and those challenges are sort of reflected in the broader economy, but, you know, workforce is first and foremost.

Rep Keith Ammon ([01:04:31](#)):

Excellent. We have some more questions.

Rep Michael Harrington ([01:04:36](#)):

Yeah, thanks for taking my question. first I gotta say this was, I got the opportunity to speak to you. I think the new format, Nuclear News is a huge improvement <laugh>, and nothing's changed in that magazine for, it'll be 50 years. I've been getting it starting next year in this new new format is a big improvement, and the certification program is also a great idea. What I would like to ask you about was given Vogtle and what happened down there, and I just look, they're still at 0% power. They haven't declared commercial operations yet. I don't know what the, the newest problem is, but there's something not good going on right now. Is this basically the last shot we have for, for non-government funded nuclear plants? Because, I mean, Vogtle was kind of a financial disaster. I know Westinghouse says they've learned all these lessons. They, they're building them other parts. They just signed, I think, contract for two AP1000s in Poland. But is is, is, do we gonna have one more shot after this? And if we can't build plants on time and on, on money, on budget is that gonna be basically the end of small nuclear?

Craig Piercy, ANS ([01:05:43](#)):

Yeah. So I, I appreciate, you know, you, you, well, first of all, thank you for your compliment on Nuclear News. That's, that was that was personal project of mine. And but our team really did

Rep Michael Harrington ([01:05:58](#)):

You did a good job then. Thank you.

Craig Piercy, ANS ([01:05:59](#)):

Yeah, no, thank you. But it was my team that really did a good job. I just kind of, I just kind of held the riding crop. no. Look, I think that I think that, that, it may be a little stark to say that this is our last chance, but I think the sentiment behind the comment is, is, right. I mean, we have to learn from the mistakes of the past. And I think that again, you know, recognize that, you know, part of this, the, the, the, the technological issues weren't the ones that gave us the problems, right? It was the regulatory, and it was, it was the, the, the business structure that allowed everyone in that in that project to think that they were fully covered for any kind of risks. And they didn't assume that that, you know, Toshiba would go bankrupt, right?

([01:06:47](#)):

So I think there's a certain amount of recognition that that it can't go the way that it's always gone. Now, I, I do think when you're dealing with you know, again, SMRs and especially some of the smaller ones where you're talking about building them in a factory environment, you know, once you have it, you know, you're not building stick-built plants, right? We're not building airports. And so the ability to achieve the kind of economies of production that will be required to bring the LCOE down to be competitive with other clean sources of energy it, it is gonna significantly improve our chances to do it.

But, you know, industry has a responsibility here, right? And it has a responsibility to be, to set expectations appropriately, both in terms of cost and timing. You know, and, and there is an expectation that the regulator will act in a timely fashion as well.

(01:07:55):

I think part of the, and I, I, the previous speaker mentioned it, you know, the the Vogtle plant, Vogtle three and four went through the, the NRC's part 52 licensing process. The benefit to that was once that, that reactor has a design certification, you can build it without having any additional public, you can build it and operate it without having any other you know, regulatory stop points, right? No more mandatory hearings, but you have to build it exactly the way that it was designed and presented to NRC. So with Vogtle, they had a huge, they had a huge issue with pouring the base mat for those reactors, right? They, they, they, they spec'ed something in the license application. The rebar is supposed to be so and so many inches apart. The reality is the way the you know, the way, the way that rebar is done, there's a little bit of variance in the, in the distance between the rebar in those in those constructs.

(01:09:00):

And so, you know, they ended up having people having to walk around. They cut out sort of a two, you know, notches in a two by four, eight inches apart, and we're going around measuring every last bit of rebar. Now, was that a safety significant issue? If one piece of rebar was 8.1 inches wide as opposed to eight inches wide, did that, you know, create a safety significant issue for the construction of that plant? No, it didn't. And but yet, you know, therein lies some of the, the, the regulatory challenges. So I think there are a lot of people that have learned their lessons. My hope is that that and you know, that, that the combination of having learned the lessons from the last time, better business practices, factory production, gives us that good shot. But I, I would agree with you. I mean, I think, I think, you know, I can't tell you for sure that there's only one shot left, but I think we need to act that way.

Rep Michael Harrington (01:09:56):

And another follow up Mr. Chairman? Okay. One of the things I'm looking at, I just saw, you know, Westinghouse's come up with their mini AP 1000. Now, I think it's 320 megawatt single loop. Holtec was talking about 160 megawatt, PWR (pressurized water reactor). So even though a lot of the SMRs have minimized safety related components, those two designs at least, would still have quite a few of them, and even the other ones have some safety related components. How do you see the qualification of these safety related parts through part 21, is this gonna have to be, do you see a third party qualifying industry building up? Or, or is each a designer and manufacturer, a Westinghouse, Holtec, whatever, gonna have to get their, all their parts and qualified them themselves, which to me would seem to be a kind of expensive way to go?

Craig Piercy, ANS (01:10:46):

Yeah, I, I, my, my sense is that that I, I, I, I don't want to say too much because it's not my area of expertise, but I think what you're gonna see is a combination of both, right? And I think there is an opportunity for you know, for, for companies within the industry to specialize in this area and to be able to provide those to be able to provide those services.

Bart Fromuth (01:11:12):

Hi, Craig. My name is Bard Fromuth, committee member. You answered part of this question already with representative Thomas. but my, my question is geared towards, you know, from a state policy perspective, so much is guided by the federal government towards nuclear. what, what can we do at a

state level? Just thinking out loud, you know, would there be things like changes in our renewable portfolio standard where we invited nuclear wrecks to come into that? What, what could we do from a state policy perspective to really, you know, bring these technologies to bear in New Hampshire?

Craig Piercy, ANS ([01:11:44](#)):

Yeah, I mean, I think that, I think that you, you, you, you hinted at the answer, right? I think at, at a minimum, you know, ensuring that, that your, your policies writ large are technology neutral, right? And, and ensuring that there aren't any direct or indirect barriers to to the, the development of, of, of that technology. I think that you know, beyond that, obviously there are, there, you know, there are other opportunities to, as you've pointed out, you know, make changes to your you know, RPS/CES to support and again, in a technology neutral fashion you know, clean firm dispatchable energy you know, to ensure that, that you don't have you know, ultimately too much intermittency in your, you know, in, you know, fragility based on intermittency in your grid.

([01:12:47](#)):

And I think, I think really just doing what you're doing now, sort of keeping track of where of where the industry is, I think there are opportunities to, to you know, begin to have discussions with, as you're doing now with entities that might be interested in deploying. My sense is that, that the financial community is, is coming around on this. It's not going to happen overnight, but I think we are going to see with the, the tax credits in the IRA a sufficient amount, you know, in the, in the medium term, we're going to see private capital continue to grow in this area once the you know, once some of the, the developmental risk has been rung out as we move forward. I don't think it's gonna require major financial commitments specifically to nuclear on the part of the state.

([01:13:45](#)):

I think the, we're gonna see the environment continue to grow where as long as you are, are you know, being technology neutral, but recognizing and, and, and placing an importance on the need for clean firm dispatchable energy. You know, I think ultimately nuclear, you know, nuclear needs to be ready to compete. so I, I'll, you know, I, I would say our friends at NEI may have some more specific suggestions for you, but I would say as sort of a general policy course that would, that would be the one I would, would suggest. Thank you.

Marc Brown ([01:14:25](#)):

Craig. Thank you. Marc Brown, I'm also a member of the commission. kind of following up on Representative Harrington's question and your comments, kind of about the NRC and rebar and that, you know, the, the South Koreans seem to have a bit of a secret sauce in able being able to build, you know, economically viable plants. You know, I think they built over five gigawatts in the UAE. Is there a particular reason for that? You know, other than it, it can't all just be regulatory morass. I know this, we could probably have a whole session on this, but any comments would be appreciated. Thank you.

Craig Piercy, ANS ([01:14:59](#)):

Yeah. My, look, my sense of this is that again, if you look, if we were to try to allocate blame here, very little of that blame would land on nuclear technology itself. I mean, Vogtle is the perfect example, you see, you know, behind schedule over budget. Now, listen, I I do wanna say one thing about it. I think that that the, the men and women of Southern Company and Westinghouse and all of the other companies that have been building this, have done a heroic job of, of a first of a kind technology. And in about two years from now, the memories of, if anyone's ever done a home renovation, they know the

memories of being over budget and behind schedule are gonna fade away. And you'll be left with this wonderful, clean energy asset that will churn out carbon-free, reliable electricity for the next 80 and perhaps a hundred years.

[\(01:15:57\)](#):

So, I, I do think, you know, some perspective is an order here, but but I do think you, you, you, those iden, you know, you have four of those plants, basically identical versions of those plants built in China, basically on time and on budget. And by all indications are, are operating superbly at this point. So, again, I, I think there is a, there is a common mode issue that we have to face in this country about how we build large capital projects like this. It doesn't really have so much to do with the nuclear technology involved in it as it does our, you know, sort of inability or maybe it's optimism bias. You know, I mean, everything from the, you know, the big, the big dig to bridges. I mean, you know, we're always, we're, we always seem to be on our, on our back foot when it comes to these large projects. I don't, I, I don't have any magic advice here, but again, I would say don't, don't, don't assume it's a nuclear issue. It's really a large pro, you know, a large first of a kind project issue that you know, it just costs us more here. And it's unfortunate, but it's a reality,

Marc Brown [\(01:17:17\)](#):

Thank you.

Craig Piercy, ANS [\(01:17:18\)](#):

Which I, which I think is why, you know, the, the SMRs factory production you know, overcomes and, and addresses some of the fundamental issues that cause those problems.

Rep Keith Ammon [\(01:17:32\)](#):

Great, thank you. You can see from our website, the past speakers that we've had. We've had most of the companies that you mentioned in your talk. Christine Csizmadia from the NEI, she is a frequent listener on Zoom. She's not on this meeting, but she's on pretty much all of them. If you have suggestions for us on gaps that we need to fill in our knowledge collection, we'd really appreciate it. I, I learned recently that the Idaho National Labs has a program that engages with state legislatures. We have not had them on, but if you have any suggestions for programs like that we'd really appreciate, you know filling out our, our knowledge base.

Craig Piercy, ANS [\(01:18:18\)](#):

Yeah, I'm happy to you know, happy to jump offline. I also have John Starkey from, from our organization who's also on the call. I'd be happy, we'd be happy to put our heads together and maybe suggest some some, some other invitees that, that the, the committee would benefit from hearing.

Rep Keith Ammon [\(01:18:39\)](#):

Great. I'm gonna put somebody on the spot. Don, would you like to introduce yourself to the commission? And there's a, there's a mic over there if you press that Marc. Yeah.

Don Kreis, State Consumer Advocate [\(01:18:55\)](#):

sure. I'm I'm Don Kreis. I'm the state's consumer advocate. I guess the first thing I wanna say is I, I really enjoyed listening to Mr. Piercy, but I don't have any questions for him specifically. Sure. So I'm, I guess

my suggestion would be you could finish up with him, and then I, I do have a few thoughts I could share with the commission if you'd like.

Rep Keith Ammon ([01:19:18](#)):

Yeah, that'd be great. Great. You have a question, Dick? Oh, just pass the mic over there.

Dick Barry ([01:19:32](#)):

Green, green light is on. Red lights coming up. How, how do you address the issue of, of SFD, spent fuel disposal?

Craig Piercy, ANS ([01:19:43](#)):

Sure. So so as I mentioned in my in my discussion I think that, you know, first of all, let's you know, let's recognize the, the good news of our situation, right? Which is we have a method of, of storing used fuel in dry casks that have been licensed for a hundred years or more. Each of those each of those dry tasks can hold the equivalent of 2 million pounds of carbon emitted to, in, into the atmosphere by a fossil plant. So again, no moving parts convection cooling they are you know, no, I mean, you can, you, you can, you can hug one of those for days on end and not, and not come anywhere near a dose that, that would, you know, that would be detectable beyond background radiation. So that's the good news. It's safe.

([01:20:41](#)):

Now, what we don't have is is a fully laid out long-term waste policy. And, and that's not necessarily a bad thing either, because right now our current policy, it's based off of, of legislation that was passed 40 years ago assumes a once through fuel cycles. So in other words, we can construct a fuel rod assembly, we irradiated in a reactor, generate clean energy, and then at the end of that, we are you know, that that fuel rod, that used fuel rod is, is destined to be placed in long-term geological repository. The reality is that, that when you, when you pull that fuel rod out of the, the reactor, at the end of its at the end of its, its, you know, time in the core that still has roughly 95% of its potential energy still left in it.

([01:21:43](#)):

So, you know, it's, it's, it's pulling a 12 pack out of the freezer, drinking a beer, and then, and then, you know, setting aside the other 11 cans. Now, we don't necessarily have well-developed commercial programs for the recycling of lightwater reactor fuel. So you know, recognize that the you know, the volumetric the volumetric size of all of the nuclear fuel rods that have been irradiated in since the beginning of the US civil nuclear program some 60 years ago, would basically fit inside of a Walmart. So the, the size is small. The, the potential for, for generating or harvesting energy, recycling those fuel rods is high. We're not gonna do it in the next decade or so, but we are seeing private companies out there beginning to look at the economics of recycling fuel. And I think that, that as we move forward, you'll see a commercial industry assuming that, that the government has created the right set of incentives, to begin recycling that that stockpile of used fuel.

([01:22:58](#)):

Now, that doesn't mean that we're not going to have any kind of waste that would need to be in place in a geological repository, but but again, there isn't anything that, by not being in a repository today presents some kind of clear and significant safety danger to the public. And, and I think, you know, the other thing to take some comfort from is we're seeing significant progress in other countries around the world in developing geological repositories. I would remind you, we do have an operating geological repository in this country today in Carlsbad, New Mexico. So we know how to do it. We've, we've, you

know transported over 5,000 nuclear fuel rods without any kind of incident. So again, I think the, the I don't, you know, people, people define waste as a problem, and I mean, you can, you can argue maybe to a degree it is, but I would argue it's as much or more an opportunity for the future as it is a problem for now.

(01:24:02):

And I would, I would commend anyone to take a look at Madison Hilly, who heads up an organization called the Campaign for a Green Nuclear Deal, recently wrote a an op-ed in the, in the New York Times. that I think really has a a, a good, you know, a good take on this on this issue from sort of a, a social license standpoint. So you know, again, I think that recognize that, that what has happened in what's happened with nuclear fuel cycle policy in the past and the back end of the nuclear fuel cycle has probably been dominated more by, you know, demagoguery frankly, than, than you know, than any kind of significant public health and safety threat.

Rep Keith Ammon (01:24:56):

Alright, great. we have a question from commissioner and could just introduce yourself for the guests.

Pradip Chattopadhyay, PUC (01:25:02):

Yeah. Yes, as Keith just mentioned, I'm PUC commissioner here in New Hampshire, and this is my first meeting and I have no background in nuclear science or anything. My, my training is in economics, so something that sort of intrigued me, and I have very little, little knowledge about the new technologies. You mentioned something about battery systems, and you also mentioned, I think I heard like one megawatts or something like that. I'm trying to understand, you know, can you give, give me a sort of it doesn't have to go into a lot of nitty gritty, but a, a little bit more sense of what, what do you mean by that? And, you know, essentially it's maybe subconsciously driven by my consideration of costs, so I'm trying to understand that technology. Sure. You talk about it a little bit. Yeah.

Craig Piercy, ANS (01:26:13):

So so there's sort of, there are two, there are two sort of call storage concepts around nuclear that maybe I can talk about in the, in, in the broadest sense. So one of 'em is, is, is the informal term is **nuclear batteries**. But what these are, are, are small reactors called, essentially called heat pipe reactors, where you have a, a, you have an enclosed circulation system that provides a sort of a continuous fission process where again, you generate heat, right? If we think about all of this, this is just a you know, a nuclear reactor is not unlike a coffee maker, right? We're, we're sort of, you know, creating heat to do something useful. So these small reactors they're the micro reactors real, don't have any moving parts, but just have sort of an embedded you know, embedded system where they you know, sort of move a coolant from one side to the other using convection.

(01:27:25):

I'm, I'm, I, it's very hard for me to explain without having a, a picture associated with it. But the bottom line is they, they don't require really a, any kind of operator intervention on a daily basis. So they can actually be you know, trucked or even helicoptered into a remote location, placed in a, in a concrete bunker and covered and can operate for periods of, of five to, you know, five years or so. Providing energy, I mean, the, the, the, the applications here are say military basis or remote locations in places like Alaska, where the, you know, the current method of energy is, is trucked or flown in diesel fuel for generators. So that's sort of one you know, that's one, the, the micro reactor, the nuclear battery. That's sort of one concept or use case.

[\(01:28:24\)](#):

The other one that's, that's really interesting is the is, is combining a nuclear reactor with with a molten salt heat source. So if you think about in the renewable energy world, you have concentrated solar energy, and it uses a molten salt loop to essentially store the heat generated from those you know, from the, the heat from the, the solar mirror panels and into into molten salt that essentially holds that heat for days on end. And then you can call on that heat to to generate energy when the sun isn't shining. Well, the, the Natrium reactor, which is a, a, a partnership between Terra Power, a company nuclear company founded by Bill Gates and and GE Hatachi are, are building the first of those reactors in Kemmerer, Wyoming at the site of a closed or a soon-to-be closed coal plant.

[\(01:29:27\)](#):

And so that's a larger reactor that's I think somewhere around 500 megawatts. But it will generate energy. so the nuclear reactor will run at all times at a time when there is a need for elec to put electricity on the grid. It will dispatch electricity directly to the grid, but on a part, you know, but assuming that grid also has significant renewable resources during, you know what, call it sunny or windy days where you're, you're generating most of your electricity from renewable sources, that reactor can, can divert the heat into the into that molten salt storage system, and then pull back to put energy on the grid in the evening or overnight hours when you may not have the other renewable resources you have. So it's sort of, it acts as like an anchoring function to a, a grid that has fairly high renewable penetration. So you know, again, I think that's, that's those are a couple of the concepts that can, that can address the, that issue.

Pradip Chattopadhyay, PUC [\(01:30:33\)](#):

A very quick follow up on the heat pipe reactors, the I think you call micro systems probably are they already out there, like in other countries? And, and I'm just curious.

Craig Piercy, ANS [\(01:30:49\)](#):

So they're not new in the sense that we've used them. We've, we've, we've developed them before. I think the thing to remember about nuclear technologies, all of these were tried in the 1960s or seventies in an experimental way. You know, to my knowledge that there, there are not any commercially operating heat pipe reactors. So this would be a new a new product for the civilian market. But but, you know, and you have a couple of different companies, Westinghouse and Oklo, that are, that are developing that, that kind of technology. you know, we're seeing also a fair amount of back and forth from there is the Department of Defense also has a program to start working. yeah, actually something's pulled, pulled up here. oh, there we go. There's, yeah, there we go. So again, I think they're, you know, they're, they're not the, the technology itself is not new, but the commercial application of them would be.

Pradip Chattopadhyay, PUC [\(01:32:00\)](#):

Space as well. Space ground.

Rep Keith Ammon [\(01:32:03\)](#):

Great. Yeah, we had Westinghouse present a few weeks ago, a few months ago. So that's their, their battery version. There was, there was a a scene in Nuclear Now towards the end that showed a, you know, futuristic looking house that had a nuclear battery in the yard, and it was powering the house for, I dunno, 20 years or something. So that's, you know, vision of the future potentially. We have one

question online. This is from Paul Gunter and Paul, he, Paul, I think, used to live in New Hampshire and now works for Beyond Nuclear. He may have a question about the Price Anderson Act. That's just to guess. Paul, if you have a question, would you go ahead.

Paul Gunter, Beyond Nuclear ([01:32:47](#)):

Yes, this is Paul. Can you hear me?

Rep Keith Ammon ([01:32:50](#)):

Yes, I hear you,

Paul Gunter, Beyond Nuclear ([01:32:52](#)):

Yes.

Rep Keith Ammon ([01:32:53](#)):

Yes.

Paul Gunter, Beyond Nuclear ([01:32:54](#)):

Okay, thank you. I'd like to follow up on the question with regard to the high level radioactive waste repository. And it's actually a question for Mr. Piercy and the American Nuclear Society and the com the commission as well. again, when I lived in New Hampshire I, we were faced with the Department of Energy coming to the state and looking at the Cardigan Pluton around the Hillsborough area in seven towns that were confronted with the possibility of eminent domain for a national sacrifice area for 80,000 metric tons of irradiated nuclear fuel. The Department of Energy is currently they've abandoned that, that notion of approaching the public. But they've now are pursuing a consensus based approach for nuclear high level radioactive waste repository. Given that New Hampshire already has a candidate site there in the Hillsborough area.

([01:34:14](#)):

I'm curious if the American Nuclear Society has been working with the Department of Energy for opening up a consensus based process for the state of New Hampshire and the Cardigan Platon being a, you know, the Granite State folks should be aware that New Hampshire remains one of the leading candidates right now for this process. So what's the ANS's position on consensus-based sighting? And, and I'd also like to hear some thoughts from the commission about opening up this dialogue in their report that they're planning issuing to the state of New Hampshire. Thank you.

Craig Piercy, ANS ([01:35:02](#)):

Well, I'll only comment so just my understanding of where the what the Department of Energy is doing is they are indeed pursuing a consent based process for the, the sighting of an interim storage facility. So, a, a you know, a place where we would it wouldn't be a geologic repository, but it would be a place where we could centralize the storage of used nuclear fuel, you know, focusing, especially on the, on the closed plant sites that that still have a volume of fuel on that site. so I don't, there, there isn't, there isn't, as far as I know any discussion within DOE about a any kind of process for selecting a new repository, so where, where ANS is at this point. But I think at some point, the, the, you know, the discussion will you know, we, I think we, we recognize that really a, a consent based process is in many ways gonna be fundamental to, to having a, a you know, a successful backend fuel policy.

[\(01:36:15\)](#):

Where we've placed our focus is on defining really defining what the, the, and having a discussion and a debate about what the, what the safety standards should look like for a, for a repository. Because again, if, if you're ever gonna have a conversation with a community and find a, you know, a willing host community as, as is happening in, in Canada and other countries around the world, you really have to have a good set of a good, strong set of safety standards so that a community can consider that possibility. But I think at this point, I mean, let's, let's sort of step back for a minute and say, I think, you know, we're, I don't see a lot of action on a repository in the next few years. It, it, it's certainly not needed from a, from a safety standpoint. And I think we have a little bit of the luxury of time to do this the right way, especially considering it is unlikely that we are going to place all of those fuel rods that we have in our portfolio today underground, with 95% still usable energy left in them. So I think we're gonna, we're gonna give innovation a chance to, to, to, to work on this.

Rep Keith Ammon [\(01:37:34\)](#):

All right. Great. And Paul, you have a second question?

Paul Gunter, Beyond Nuclear [\(01:37:37\)](#):

Just to follow up you know, the US Nuclear Regulatory Commission just licensed an interim facility in New Mexico that's going to go to court challenge, of course, but you know, again, I, I have some concerns about the avoidance of talking about what is going to be beyond interim. That that facility is only licensed for 40 years. And the American Nuclear Society and proponents for nuclear energy are talking about you know, it obviously nuclear waste storage on that level is gonna be much larger than a Walmart. You know, we're looking at if if seven towns around Hillsboro are supposed to turn over their history and heritage to a national sacrifice area that's of a little more consequence than a Walmart. And I'm, I'm concerned that there's an avoidance of that discussion and the ultimate responsibility and liability that goes beyond a single wad of benefit for future generations. And it is a concern of mine and others that this discussion be forthright and upfront before we start making more of this high level radioactive waste. And so I think it is a question for the commission as well as to whether or not you're going to take up this discussion in your report to the state of New Hampshire.

Rep Keith Ammon [\(01:39:18\)](#):

Paul, can I ask you a question? Are you paid by Beyond Nuclear? Is that your employer?

Paul Gunter, Beyond Nuclear [\(01:39:23\)](#):

Yes, I'm on staff. We're a nonprofit organization. but, you know full dis disclosure, I was part of the, I was, I was one of the founders of the Clamshell Alliance in 1976 to oppose the Seabrook Construction.

Rep Keith Ammon [\(01:39:40\)](#):

So you are a lobbyist, and

Paul Gunter, Beyond Nuclear [\(01:39:40\)](#):

You know, which turned out to be its own financial boondoggle, but we've not really arrived at any kind of resolution for that issue as well.

Rep Keith Ammon [\(01:39:51\)](#):

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Understood. Paul, so you are a lobbyist. In New Hampshire, lobbyists are required to be registered with the state. Are you registered with the state?

Paul Gunter, Beyond Nuclear ([01:39:59](#)):

I'm a member of the public as well. And I'm not registered in the state of New Hampshire as a lobbyist. I'm part of a public education program.

Rep Keith Ammon ([01:40:10](#)):

If you have suggestions for the commission, you could email them to us. I know you requested that we invite a speaker and that person is on the list. We're getting through our, you know, our list of potential speakers. And so we will do our best to include, you know, dissenting voices, which is important. Thank you. But we wanna, we wanna be upfront about who we're representing. Alright. Thank you, Mr. Piercy. We appreciate your time and I know you wanted to stop at 10:30. we appreciate the extra time that you gave us, and we hope to be in touch in the future. Thank you all. Thank you.

Craig Piercy, ANS ([01:40:46](#)):

Thank you, members of the commission. Happy to help. Have a good weekend.

Rep Keith Ammon ([01:40:50](#)):

You too. You too. All right. And it's for people. We're gonna, we have a few more minutes of commission business. We had a question online. Timothy Smyth, I don't know if you're still there, but Timothy had a question about restarting the Seabrook Science Center. And I know Doug, you've probably been there on a, on a trip. I've been there once. Yeah. I went there on a, on a school trip when I was on a school trip. Yeah. Yeah. <laugh>, it was great

Rep Michael Harrington ([01:41:20](#)):

Of economics.

Rep Keith Ammon ([01:41:22](#)):

I

Rep Michael Harrington ([01:41:23](#)):

Speak the next year, but 12

Rep Keith Ammon ([01:41:27](#)):

Economic review. Yeah. But we went, I think Doug, you and I went on a trip maybe, maybe together back in the day. I remember one trip though. Yeah. Yeah. We had a good, it was pretty very good.

Rep Steven Bogert ([01:41:36](#)):

Good. Yeah. If I may,

Rep Keith Ammon ([01:41:37](#)):

Hold on. We got mics we gotta worry about here.

Rep Steven Bogert ([01:41:44](#)):

My name's Representative Steve Bogart. I'm with the public Works Commission. I'm here as a visitor. Thank you for allowing me to speak. I had an opportunity to go see the nuclear reactor in North Carolina at the Duke facility. And they had a visitor center there. and I found it quite intriguing that you could go in and have education and get education. They had their local high school students and stuff go in there. And they had one of their nuclear engineers come and do the presentation and stuff. And I found it quite intriguing to sit and gain some of this knowledge. And they stayed behind it and had a nice hour long conversation with me. And so, even though we say economics and stuff, sometimes getting the word out and educating people up front is a cost savings instead of a because people are afraid of things and you end up with everything getting slowed down because no one knows anything.

([01:43:06](#)):

So the fear of not knowing takes it to court and slows it down. So maybe it shouldn't be looked at an economical problem, but as a chance to educate the people in a matter, they had a lot of things how the castings, they had the size of the nuclear rods so everybody could sit there and see actually what it is, how these rods are being loaded. They had the, the big case that feeds the reactor. I mean, it was really an amazing opportunity to see something I didn't really know anything about. And I find myself becoming more comfortable after listening to what they had to say. So, you know, if at all possible, that should be something that would help.

Rep Keith Ammon ([01:44:00](#)):

So more hands on education? Yes. Okay. Thank you.

Marc Brown ([01:44:04](#)):

Yeah.

Rep Michael Harrington ([01:44:06](#)):

One of the difference there is that, that Duke is a vertically integrated utility, and I maybe defer to my friend across the way here, but who would be making these type of decisions? It's very possible that Duke puts those public education costs as a prudent cost. They submitted to their commission, and the commission says, yeah, these are costs you can recover through rates because it's education for the public now in New Hampshire, NextEra has no opportunity to do that if they are going to staff up and keep their education center going. It's just what comes right off their, off their profits. They, they have no way of passing that through. The rate pays because they're in a competitive market, and they're gonna get paid what they get paid. So I think this, that's kind of a major difference between two things. And that's probably, and also Duke has multiple plants in the area, but it's, I understand the, the need for education and so forth, but it's a very different structure for how the economics work between a vertically regulated state like North Carolina and a merchant plant state like New Hampshire.

Marc Brown ([01:45:05](#)):

Maybe there is IRA money out there or something that we could talk to the folks at DOE about that could get, you know, for education. I don't know. I'm just throwing it out there, but we can Okay. It might be worth taking a look at.

Rep Keith Ammon ([01:45:18](#)):

Very good. So okay. Dick, you pushing, make sure, just grab the mic so we can there's still people online and we, we want them to be able to hear, and it goes in the transcript too, so we can get it in the minutes.

Dick Barry ([01:45:31](#)):

I'd like to clarify my question about the, the reserve spending on the spent fuel. Yeah. I have a friend who commanded a nuclear powered submarines for years, and he said I don't wanna read the whole thing, but he said, we've, we've had nuclear power in these submarines for years now. People close closely by it. never an issue. And I don't understand what the big fuss is about the whole thing. We can make it work.

Rep Keith Ammon ([01:46:03](#)):

People live for weeks or months at a time, right. Next to one underwater, right? Yeah,

Dick Barry ([01:46:07](#)):

Exactly. So that, that, I just wanna clarify. Yeah. I'm not against it. What,

Rep Keith Ammon ([01:46:12](#)):

What was the what was the naval officer's name? Rick.

Rep Michael Harrington ([01:46:17](#)):

Rickover we're talking about the guy with the father of the nuclear navy. Yeah, Hyman Rickover. He I met him once and showed up impersonating a worker at the Norfolk Naval Shipyard and tried to get by the radiation guidelines, if you will. He would do that, pretend and see if he could talk his way in. And of course, it wasn't a secret that he was there, so people were up against here's Admiral Rickover telling me something, but he's pretending he's not Admiral Rickover. And what do you do? Do you let him in? If you, if he'll you, you, you can't let him in. But some people did. And then of course he would, he would write 'em up for it. So he was quite the character to say the least. I, the thing I just wanted to mention is on the, so people understand, cause I, not sure everybody does, there's two types of storage that's being talked about.

([01:47:04](#)):

There is the, the storage that were proposed for Nevada, which is the long term geological storage, putting this stuff down there. It's gonna be no leaks, no nothing for, I know, I think the latest is a hundred thousand years or something like that. And that's buried underground and, and so forth. What we're talking about with interim storage is basically consolidating what we have right now across the country of nuclear plants. One of the issues is, I guess you could say two issues probably. One is security, in that you have to pay to have these in a secure location. So if you're at the Plymouth nuclear plant or the Vermont nuclear plant, or the main Yankee nuclear plant, all of which to close, but they all have spent fuel stored at their facility. So they're paying some security force to be there to make sure that, you know, no one goes in and tries to blow 'em up or anything like that.

([01:47:52](#)):

The idea of interim storage is to move those casts that is, as we stated earlier, I mean, they're aircooled, there's no moving parts. Nothing can go wrong with them unless, you know, someone tries to blow them up. Literally, they're not going to, they're not gonna melt. They don't have to do anything with

them. They would be to consolidate them for the purposes of just putting them one area, and then obviously you'd save money on security on that, and it would be, it would be more efficient. The, the problem with that comes is that these are very, very, very expensive to transport, because you have to put 'em on trains and sometimes on trucks. And obviously one way you could damage them is that there was a major accident, even though they spent fuel cast of, you know, they drop 'em from 80 feet onto metal spikes and run them into concrete walls and stuff. But there'd be a huge cost associated with doing that. And that's sort of the balance. But we're not talking about underground long-term storage, which was, was contemplated some years ago. So no one's talking about coming to New Hampshire and taking over eight or 10 towns. That's, that's just fantasy land talking.

Rep Keith Ammon ([01:48:55](#)):

Thank you. Doug, you have one thing? yeah, grab, grab a mic if you have something to say.

Rep Doug Thomas ([01:48:59](#)):

No, just for the commission. Yes. Time for permission to tour Seabrook ever been, lemme know. I, can get you a tour.

Rep Keith Ammon ([01:49:08](#)):

Yeah, we'll talk about that. Okay. And it's definitely worth it. Yeah. So maybe Thanks Mike, by now. Yeah.

([01:49:14](#)):

Alright. Don, do you want to have the floor? And I, I, I appreciate you coming to the commission. That's exciting to engage.

Don Kreis, State Consumer Advocate ([01:49:23](#)):

Sure. You want me to hold the microphone?

Rep Keith Ammon ([01:49:25](#)):

Yeah, would you, if you don't mind.

Don Kreis, State Consumer Advocate ([01:49:31](#)):

Hi everybody. I, I, I, I'm here because of your excellent website, and I must say that I'm, I'm jealous. I think you all know me, but maybe one of two of you don't. I'm Don Kreis, I'm the state's consumer advocate. I run a cute little state agency that its, is to advocate on behalf of the interests of residential utility customers. So I just went through the process of redesigning my office's website. I am a mandatory customer of the State Department of Information Technology. And let's just say my website does not look as nice as yours does. And I don't know who designed it for you. I'm just, sorry, I couldn't hire that person. I don't know if it was the chairman or, that's my little side project. Yeah. Ah, well, sorry, I couldn't hire you. I, I just wanna take a minute to establish my nuclear bonafides because people tend to assume that I'm gonna be anti-nuclear.

([01:50:22](#)):

My nuclear bonafides go back to 2011 or 20. Yeah. 2011 when I was on the faculty of Vermont Law School and Entergy, which owned Vermont Yankee, which was operating at the time was in a lawsuit with the state of Vermont. Because the state of Vermont, in its infinite wisdom decided that it would

assert what it thought was state authority to shut down Vermont Yankee. Entergy sued in federal court, and my employer of Vermont Law School decided that it wanted to get into the fray. So it created an online faculty blog about the subject, and they invited four faculty members to participate. The other three were Pat Pereno, Cheryl Hannah, and Michael Doergen. maybe some of you have heard of some of those people. They were Vermont heavyweights, and I was the fourth of the four of us. I was the only one who correctly predicted the outcome of that litigation, which was, are you kidding me?

[\(01:51:25\)](#):

The state of Vermont can just order a nuclear power plant to shut down. Heck no. That is a preempted federal authority. And the Vermont Yankee, of course, had a valid license from the NRC. So I, I, I, I'm, I'm not reflexively anti-nuclear the way most people assume I am. And I'm very intrigued about any inquiry that has to do with nuclear power and its potential future in New Hampshire. I went online this morning and I found an interesting story from S&P Global, which I can share with you, and it resonates really nicely. Actually, can I have that one back, because that's not my No <laugh> it, it resonates really nicely with what, what you've been hearing today. To me, the the nut graph is the first sentence on the second page, which says, this has to do with a panel discussion that happened yesterday in Washington DC in front of the Energy Bar Association.

[\(01:52:29\)](#):

And on the first, the first sentence of the second page says, to overcome advanced nuclear's challenges, panel experts said, regulators must step in to help de-risk the industry financially and help ease regulatory hurdles as market momentum for the technologies accelerates. So we all confront a problem as people who are active in a state whose official policy is to be techno technology neutral about sources of energy. Because what the industry is saying here is that essentially, one way or another, we need help from the government in order to get over the hurdles we confront. The other interesting thing about this article is the next sentence. At the end of the day, one of the panelists said, wall Street will crush the Chinese and Russians as long as we have proven technology that the market needs. So the point here is that the Chinese and Russians are out ahead of us and will dominate the nuclear industry if we let them.

[\(01:53:30\)](#):

And the way not to let them is to basically help the nuclear industry financially get over its hurdles. So as my friend, Representative Harrington has pointed out to you, we live in a state that has deregulated and restructured its electric industry. So any new nuclear power plants are going to be merchant plants. And so the state can't put them into rate base and basically tell everybody that they get to pay for it. Now former Representative Fromuth pointed out that we could add nuclear to our renewable portfolio standard. And, you know, that is not only an interesting idea, but one that has been it has successfully withstood skeptical scrutiny in front of the US Court of Appeals for the Second Circuit, which makes it intriguing. But again, you know, that really amounts to what some would call a subsidy.

[\(01:54:29\)](#):

Anyway, I'm really interested in the work of this commission and I hope to follow it. And I, I think this is an important conversation and I'm eager to be part of it. I'm sorry, I, I, I, I, I saw the legislation pass by and I thought, oh, that's interesting, but then I forgot to follow up and start coming to your meetings and pay attention to your deliberations because because rate payer interests clearly are significantly impacted. And we do in fact need the kind of carbon free baseload power that the industry representatives are telling you about. Great. I think that's all I have to say.

Rep Keith Ammon [\(01:55:10\)](#):

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Excellent. I think, I think the idea to put to add nuclear, so instead of like renewables, it would be clean energy, which would include nuclear is in the the five year energy plan that the Department of Energy put out most recently.

Don Kreis, State Consumer Advocate ([01:55:28](#)):

So it's a 10 year plan.

Rep Keith Ammon ([01:55:29](#)):

Our 10 year plan that's right. Five years is what the communist do. We do, we do 10 year plans. Yeah. But I think that, I think that idea's in there.

Rep Michael Harrington ([01:55:37](#)):

There some effect already. That's impact in Connecticut.

Rep Keith Ammon ([01:55:40](#)):

Fact, is it? Yeah.

Rep Michael Harrington ([01:55:44](#)):

Contract.

Don Kreis, State Consumer Advocate ([01:55:49](#)):

Right. And so from my perspective as the rate payer advocate, that's the conversation that is the key one, right? Because it from you know, it's always about who pays for whatever energy policy we pursue. And I I, I would suggest that the commission lean into that question. I, I'm certainly interested in it.

Rep Michael Harrington ([01:56:09](#)):

Have you seen the the report that was done on

Rep Keith Ammon ([01:56:16](#)):

The mic, please?

Rep Michael Harrington ([01:56:18](#)):

The report that was done in the analysis group in Massachusetts on Seabrook, it was basically I think it was, I think, I'm not sure if NextEra paid for it or whatever, but it was, they hired the analysis group, which is made up of a lot of ex-PUC people from Massachusetts and other experts. And basically their conclusion was long-term contracts between Massachusetts utilities in Seabrook could save their rate payers millions of dollars. I don't know if you've seen that report.

Don Kreis, State Consumer Advocate ([01:56:46](#)):

I, I haven't seen that. I, I will say that a tried and true way to help secure our energy future is to get Massachusetts to pay for it. Right?

Rep Keith Ammon ([01:56:59](#)):

That's, that's why you're the New Hampshire advocate, right?

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Rep Michael Harrington ([01:57:01](#)):

This is just long term contract with day utility.

Don Kreis, State Consumer Advocate ([01:57:03](#)):

Well, indeed, and, and thanks to Representative Harrington, I have an affirmative statutory obligation to do everything I can to assure that we in New Hampshire don't pay for the public policy initiatives of other states. And Representative Harrington who drafted that language can speak for himself, but I think he was thinking of Massachusetts when he did that.

Rep Michael Harrington ([01:57:25](#)):

<laugh>, well, Massachusetts, Rhode Island.

Rep Keith Ammon ([01:57:30](#)):

Very good.

Rep Michael Harrington ([01:57:30](#)):

Well, you want copy?

Don Kreis, State Consumer Advocate ([01:57:33](#)):

I'd love it, yes.

Rep Keith Ammon ([01:57:34](#)):

Mr. Kreis, thank you for for coming to our commission. We're, we're running a little long on time, but we invite you to future meetings. this commission runs until December, so it does have a, a, a cutoff.

Don Kreis, State Consumer Advocate ([01:57:45](#)):

I'm on your mailing list now, so I'll find out.

Rep Keith Ammon ([01:57:47](#)):

Very good. Yeah. We'll, we'll keep those emails going out. We have an interim report going out in July. I think that's probably gonna be mostly a summary of past meeting minutes and maybe, maybe a look ahead until to what our final report would be. But we're interested in any input and as far as people that we should invite to these meetings if you have any ideas on those, we'd, we'd appreciate that.

Marc Brown ([01:58:10](#)):

Still working on Southern (Company).

Rep Keith Ammon ([01:58:11](#)):

Still working Southern. Yeah, there's lots, what we found, so,

Rep Michael Harrington ([01:58:15](#)):

Yeah, well, like I said, has been for the last two weeks we still planning commercial operation Big land. I think next, but unknown is why report, but yesterday they were.

Rep Keith Ammon ([01:58:35](#)):

Alright. And can I find this online somewhere or could you email it to me so I can I can email it. Okay, great. All right. Just moving on. We have some old business here. I'm gonna fly through this. I, I left Pathways to Commercial Liftoff because Matt Lavander suggested that I, I thought maybe he would be here today, but they're still refueling Seabrook. So we'll we'll push that off to another meeting. I, my wife and I went to the premiere of Oliver Stone's Nuclear Now movie. You were all invited. None of you came. I, I did notice that <laugh>, but we did have a few legislatures there. It was only playing one night in one place in the state. It was in Newington out in the Sea coast. So we had some popcorn and watched the movie.

([01:59:16](#)):

It was, it's definitely worth watching. You know, it talks, there's, there's a, you know, discussion about climate change in, in the movie, but most of it was about the history of nuclear the misunderstanding of nuclear. And talks a lot about what we're talking about here, the potential, you know, midterm future potential of nuclear. So I streaming it, nuclear it, it is not but if I find out another way to watch it in the meantime, maybe you can download a, a torrent file or something in the future, <laugh>. But that was a joke. but if I find a way to stream it, I will pass that along. Definitely worth watching. That's not in the minutes now. and then just an update. So in our statute, going back decades, there's this position of atomic, I forget, I I don't have it written down here.

([02:00:10](#)):

Lemme see if I can pull it up. Peaceful use of atomic energy. and there's a position that's supposed to be filled. It's not filled. I reached out to the Executive Council to see what the latest was. I don't have an update. There's a link to it in our, on the website, in the, the page for today's meeting. There's, back to you. Not yet. No. I need to connect with him too. so still following up on that. and I'll, I'll have an update as soon as I can. Any other discussion? Any other questions? Any, anybody still online would like to say? Anything? Last call? This is the sign in sheet. Before you leave, could you please check your name off or add your name to the list? I forgot to pass that around in the beginning of the meeting. And with that, I'll, I'll entertain a motion to adjourn. I'll move. Second. Michael, Michael Harrington and Bart Fromuth. Second. all favor say aye. Aye. Aye. Any opposed? meetings adjourned. It is 11:10 AM. All right. Thank you everyone. We're gonna end the meeting and the Zoom call.