Rep. Keith Ammon (00:04:24):

So we'll call the meeting to order. This is the wrap up meeting for the commission to study Advanced Nuclear Power. And we have a very simple agenda for today's meeting. We're going to approve or modify the minutes from our previous meeting on November the sixth. And then we'll discuss the draft report that everybody has in front of them and if we're comfortable signing off or we're going to make additional changes to this. So I think those are our options,

Sen. Howard Pearl (00:05:02):

Mr. Chair. I move the minutes as presented.

Rep. Keith Ammon (00:05:05):

Alright, Senator Pearl moves the minutes and so the report contains about 50 pages of content and then an additional 50 or so pages of all the meeting minutes. So this is a compilation of all of our efforts for the last year in one package. So the minutes from the November 6th meeting, start on page 100 and go to the rest of the document. I'll second. I'll second. Second. Senator PERS motion. All right, any discussion? All right. In favor of approving the November six minutes. Aye. Aye. Any opposed? Alright. And that is six us, so that's a quorum. Alright, so this was an ordeal. The subject matter, as we all found out, is pretty intense. And Matt, from working at Seabrook, just the conventional nuclear power plants are complicated, but this kind of breaks the mold and gets even more complicated with all different types of fuels and heat transfer mediums and different sizes of designs. So this report is a compilation of all the minutes, sort of refactored into subject matter area. Hey, welcome Mark. Sorry. That's okay. And I think there's one more for you.

Sen. Howard Pearl (00:06:51):

We did nominate you to be chair for any meetings going forward after this. Okay. We'll ask how nominating its secretary. Turned out

Rep. Keith Ammon (00:07:02):

You replaced the chair.

Marc Brown (00:07:09):

Thank you very much.

Rep. Keith Ammon (00:07:11):

Alright Mark, we just took a vote on Reproving the November 6th minutes. I sent those out I think Monday, so you should have a copy of those in advance. Alright, and now we're just discussing the final report. I'd give the, this is my personal opinion having done. A lot of it is, this is probably a B effort. If we had a little more time, I think I'd make some tweaks to it. I sent this out yesterday, which I know is last minute for a document this size, but with holidays and I had a trip, I was traveling this month so I didn't have all the free time I hoped I had. So yeah, if you've had a chance to look it over, a lot of the material was in our interim report. So we had the interim report covered meetings up until June. So we had four meetings since then. So what I went and did was went back through the different sections and sort of updated, refreshed them to include more recent information that we received. So I guess if you want a few minutes just to look it over and then we can discuss what our next steps are. And I have one extra copy here if anybody would like to. I know Alvin, if you'd like to see one.

Sen. Howard Pearl (00:08:31):

Mr. Chair, the changes that you made in the update from the interim report, is there a specific section that those are in so we could review those?

Rep. Keith Ammon (00:08:41):

So the changes were throughout and keeping track of the changes the document just looked like. Got it. So I did not do that, but if we do make any changes from here on out, we will. I don't expect them to be major and

(00:08:56):

We will track changes if the changes are minor. I brought my laptop, we can make tweaks as we go. But as you guys are reading it, if you don't mind me talking, I'll just walk through the sections. So we have a cover page, table of contents, and then the beginning of the final report, there's an overview of the commission. It references the commission's mandate, which is on Appendix A, it lists the members of our commission. Senator Pearl Yu replaced Senator Gannon after the new term. And our member from the New Hampshire Bureau of Department of Business and Economic Affairs, he has since resigned from his position that was Mikhail. So I did not list him here. He wasn't a member for very long.

(00:09:55):

And then I have an executive summary of the entire report and then there's a list of all the meetings beginning with our October 11th meeting from last year. And there's just a summary of what we went through, the different presenters that came, and just a very short outline on what they presented. And then each section has a link to the meetings or to the minute meetings in the back if people would like to drill into more detail. And then on page 10, there's an introduction, gives an overview of advanced nuclear technologies and then the importance of nuclear in modern power generation, existing nuclear power in ISO New England. So we have a list of some of the different, actually there's two current plants in NICE New England and some that have been shuttered. And then there's a list of recent nuclear energy projects in the US and there's several there, including some demonstration projects.

(00:11:01):

On page 14, I mentioned new scale and new amps and I gave an update on that. They've since parted ways. So a little bit of overview on that was going to be a first of a kind project that has gotten shuttered new scale did make an announcement on November the 20th of this year that they have a new partnership with the DOE. So that last paragraph there talks about that. And then it discusses the nuclear enlightened Admit period that was the American Nuclear Society had that concept that there used to be a nuclear renaissance and they classify this as a nuclear enlightenment and it's more driven by decarbonizing. The electric grid talks about some recent movies, Oppenheimer and Nuclear now in the next section. So it's popular culture and then it's some information about our regional energy markets, how they're broken.

(00:12:24):

Yeah. Well basically what is, and New England kind of presented to us that the energy mix is coal and oil are diminishing greatly. Natural gas and renewables are ramping up. And there's a section on potential benefits of advanced nuclear technology. And then it talks about some of the aspects of it, like the modular construction and transportability, the fact that nuclear has high energy density. So there's a graphic here from the Department of Energy National that talks about the uranium. The size of the tip of your pinky finger can replace an entire ton of coal. So it's very high energy density medium.

(00:13:12):

And it talks about how it's continuous energy supply so it's not intermittent. And then on page 18, the ability to load follow. So these new designs can ramp up and down to sort of partner with renewables. And then it talks about the passive of safety systems. So they use sort of the laws of physics to shut down safely, kind of different from the older style of nuclear power plants. And I think we heard in our testimony Fukushima had an issue because their generators were below the sea level and those generators

were needed to keep the system in a safe state. And so those generators got flooded weren't operational, and that's really the main issue that they had. So these new designs don't have that exposure according to the manufacturers.

(00:14:12):

And then it talks about small energy planning zones. So I think is it 10 mile radius for Seabrook or 10 to 25 mile? So a lot of these manufacturers talk about emergency planning zone, that's just the footprint of the site, maybe just a half an acre or an acre. And that's still being fleshed out by the nuclear regulatory Commission. But that that's the desired planning zone that they're talking about. And then it talks about carbon free energy generation that nuclear provides potential benefits to New Hampshire's economy. We heard about a national security implications from not having a robust nuclear program in our country that China and Russia maybe getting ahead of the US on that. And as they develop relationships with the rest of the world, that sort of cements them as a leader in the nuclear energy industry and that. So we have some catch up to do nationally and there's some national security risks if we don't do that.

(00:15:25):

And then it goes into the different advanced nuclear reactor technologies. It was a little difficult to classify each different design perfectly under a subheading because some of them are in multiple categories. So I'm on page 21. So we talked about lightwater SMRs. So those are more similar to traditional nuclear power plants, but smaller in scale, five 50 to 300 megawatts. And then we listed some of the manufacturers that are under that category. And then there's high temperature gas reactors. One in particular that stood out was X energy. So they have tryo fuel pebbles they're called, but they look like billiard balls. So it's sort of like a self-contained fuel packet. And there's hundreds of them in a bin that kind of circulate like a bubble gum machine. And they use hydrogen, sorry, helium gas to cool and to extract the heat from the process. So that would be a high temperature gas reactor. Anybody want to chime in on anything? Should I keep going? You cool? Okay, question? Yeah,

Marc Brown (00:16:42):

Double check it. Does the terra plant use gas technology?

Rep. Keith Ammon (00:16:53):

So I have it listed under molten salt reactors on page 23,

Marc Brown (00:17:00):

And that could be done.

Rep. Keith Ammon (00:17:05):

And if there are any inaccuracies on this, let's update it. But my understanding is they're using molten salt, but that's

Marc Brown (00:17:16):

For the storage

Rep. Keith Ammon (00:17:17):

Aspect of it. So I don't know if it's a, would you mind? I'm looking it up, checking me on that and I can actually can move it just by in the word document. And then we heard from mtech back on October and they have an interesting project where they're building, I believe it's in New Brunswick, they're building a 600 megawatt waste burning reactor and they're going to co-locate it with an existing power plant. So

they're going to take the waste. So when we went to Seabrook and we saw that building where all the waste is held, TX is going to, in a similar arrangement, they're going to build a waste recycling plant and then use that waste to power their 600 megawatt reactor. So the recycling slightly used nuclear fuel and they're going to run for I think 60 years. So that's on page 23. So that was an interesting project.

(00:18:35):

And then there's something called a fast neutron reactor, and there's a little overview of what that entails on page 24. And Oak Low was classified as a fast neutron reactor. And I think they also do something with recycling. They're going to recycle and reuse spent fuel. And then we heard from several micro reactor, so these are one to 20 megawatt plants that their market is targeted towards diesel generators. So if you have a mining operation somewhere off grid that uses a lot of diesel fuel to power their operation, these would sort of be like drop-in replacements for large diesel generators. So that's their target. Not quite a good fit for New Hampshire possibly, but you could see maybe something like in the north country or it wouldn't require an interconnection, so you could put it in the middle of nowhere. So we heard from several manufacturers talking about their micro reacts.

(00:19:50):

Now I'm on page 26 now. We heard from ultrasafe Nuclear, they stress a couple of strategic partnerships with Fome and UCO for their fuel supply. So there's some links to those companies in that section. And then we heard from Westinghouse is connected to the AP 1000 project that just came online at the Vogel plants. So they have a smaller version called the AP 300 that's not, it's designed to use all the same or all the similar systems that the AP 1000 and Vogel uses but scaled smaller. And the idea is that there's not a lot of technological risk because they're not innovating in any novel ways. They're just scaling down what they already have online. So I thought that was interesting from Westinghouse and then it goes into fusion reactors. So that wasn't in the statute that we would cover fusion, but it's become a recent news item. So I thought it'd be good to at least touch on it. So there's some explanation about how Fusion is different than fission. And we did hear from, for one, we heard from Matt Wald who was a journalist that covers nuclear energy. He talked about it.

(00:21:16):

We heard Michael Wenzel from the NRC, he touched on that the NRC is going to develop regulations for fusion reactors. We heard from Craig Pearcy from the American Nuclear Society. He talked about fusion reactors. The consensus is that it's still decades away and that the recent news about fusion breakthroughs, they're still not reaching a point where they're getting more energy out of the system than they put in. And we heard from Zap Energy back in September who's working on a fusion reactor and they have a novel way that they're doing it. They actually use electricity to sort of slam plasma together to create a fusion event. And then they capture the neutrons released in liquid metal and then that liquid metal goes to, I guess would theoretically go to run a steam turbine. So we did hear from Zap Energy.

(00:22:23):

Alright, I'll keep going. Anybody else? Is this helpful to kind of run through it? So then we talk about the nuclear fuel supply chain. The fuel and regulation were two big things that are potential hurdles for this advanced nuclear industry. So the fuel supply chain, there was this idea that kept coming up called the chicken and the egg problem. It's sort of like which came first or which comes first? Is it the consumers of advanced nuclear or the producers of advanced nuclear? So the producers don't want to create a whole bunch of product that no one's going to buy and the consumers don't want to build their reactors without having fuel to feed the reactors. So there's like a chicken and egg problem. It's probably going to take the government, the federal government to kind of break that deadlock.

(00:23:16):

And one of the issues is this halo fuel production. So HALO stands for high sa, low enriched uranium. So traditional fuel that Seabrook uses, I think up to 5% I enriched. But the halo is between five and up to

20% enriched. And I think for nuclear proliferation you have to worry about 90% or higher. So it's still not quite that level of enrichment. But this halo is even more energy dense and a lot of these new reactors will use it and it allows them to run, I think up to eight years without being refueled. And Seabrook, I think it's 18 months. So every 18 months you have to shut down for maybe four weeks or something. So these new reactors may be able to run for much longer.

(00:24:11):

And there's recent news about centrist energy. They've just come online with their pink pipe tin Ohio plant. They've just started processing some halo. So that's recent news about that. And then on page 30 we get into the tryo fuel technology. So Tryo takes little poppy seed, like tiny little flakes of uranium and some other materials and they wrap it into a larger, either like a rod or a ball. And the idea is that it prevents radiation having an event where radiation can leak out. It's more, it's safer, not perfectly safe of course, but it's safer. So that triose fuel technology is used in some of these advanced reactors. And there's a picture of it on page 30. And then we heard continuing with fuel we heard from LightBridge. And LightBridge is creating their fuel technology. There's a picture of their twisted rods, it has tryo in it. Those rods are a few feet long, it operates at a lower temperature. And this may even be an option I think for Seabrook that if you guys this may be able to power traditional reactors as well. Yeah, it could be.

(00:25:39):

And then it talks about disposal and this idea keeps coming up about recycling slightly used fuel, but there's some questions about whether it's commercially viable to do that or not. But there are some companies looking into doing that. And the idea is that the traditional reactors, they use a very small percentage of the potential energy in the fuel and that it had it all been buried in Yucca Mountain miles deep that in the future there may be ways to get more energy out of that uranium. And so there's companies working on that. It could be up to a 10 trillion industry if they crack the nut of recycling use field. And then we get into non-electrical applications. So that was in our mandate.

(00:26:39):

And it talks about, so if you have a reactor, the reactor, most reactors run a hundred percent of the time just crank out electricity, but the rest of the grid has different demands. So demand goes up and down depending on the time of day or the season. And so what do you do with electricity that is being generated but the grid doesn't need it? So what do you do with it? And you don't want to just waste it, you want to use it for something. So there's ideas of using it for hydrogen production. So hydrogen would be a type of a type of fuel storage technology. So you would be, hydrogen is more like a battery than it is a fuel. So you would use electrolysis to separate the hydrogen and oxygen atoms and store the hydrogen to be used later in combustion or fuel cell or something like that.

(00:27:30):

The radioactive materials can produce medical isotopes that are useful for diagnosing and even curing diseases. It could be used for desalination projects. So you could take sea water and make drinking water from it. And then there was a lot of talk about industrial heat applications. So a lot of manufacturing processes like metallurgy or Chris welcome. I think there's one more. We have one more. Alvin, would you mind? Sorry about that. This came off my home printer. So it was like two reams of paper. So Chris, just to catch you up, we approved the minutes from the November meeting. That's page 100 and back. And now we're just kind of walking through the, I was just kind of step-by-step. So we're on page 34 or actually 33 and we're talking about non-electrical applications for nuclear energy. So industrial heat. So there's large scale manufacturing. I think some of them are listed here.

(00:28:44):

The industrial heat can be used for different sectors like manufacturing, chemical processing, food production, metallurgy. It's used for things like drying or melting or smelting or refining or cooking or sterilizing. So traditionally this has been produced, this large scale heat has been produced with fossil

fuels or coal, natural gas and oil. So some of these designs have application for industrial heat. So it would decarbonize these processes and it gets into that a little bit. It talks about different manufacturers. And then this is on page 34, it gets into data centers. And we even heard about bitcoin mining. You guys probably know that's a favorite subject of mine. So it's prerogative to connect this two things together, but not just turning energy into a digital commodity. That's one application for it. But these AI data centers we're all familiar with how AI is kind of growing.

(00:29:53):

They're very energy hungry. So a lot of these ai you've heard of cloud computing with Google and Microsoft and Amazon, those very large data centers require, so a computer needs energy to function. So if you have a lot of computers, it takes a lot of energy and a lot of these data centers, they want to be carbon neutral. So they're exploring using nuclear energy to power their data centers. And that was confirmed. I had a conversation with the founder of Nano technology and he told me that a lot of these guys are calling him up and asking him, we turn your mic on. Sorry.

Marc Brown (00:30:34):

There's a lot of AC involved there too, right?

Rep. Keith Ammon (00:30:36):

Cooling,

Marc Brown (00:30:36):

You got to make sure that those server farms are kept at a proper temperature. So there's a lot of energy draw there, not just for the processor themselves, right?

Rep. Keith Ammon (00:30:44):

Yeah, that's

Marc Brown (00:30:45):

Right. It's more of a question than a statement

Rep. Keith Ammon (00:30:47):

That is, I mean from my understanding, I agree with it and there's ways you can air cool it or you can liquid cool it. And I think there's even talk of using, extracting the heat through some kind of liquid and then running a greenhouse with it. So reusing it for a different purpose.

Marc Brown (00:31:07):

A lot of those 350 megawatts of load continuous load is what I'm hearing for some of those data centers. That's a

Rep. Keith Ammon (00:31:13):

Lot. 350. That is a lot. So I mean I think that's, we're only going to have more and more computers running and they all require energy. So

Marc Brown (00:31:25):

You have an idea that's about one seventh of New Hampshire's peak load, one seventh sounds crazy, roughly.

Rep. Keith Ammon (00:31:34):
And that's just one data center.

Marc Brown (00:31:36):
Yes. Amazing. So think about what we would've to do here to add a data center, right? Right.

Rep. Keith Ammon (00:31:45):
With our high electric market,

Sen. Howard Pearl (00:31:48):
It's almost all of the nuclear capacity in New Hampshire.

Rep. Keith Ammon (00:31:51):
Yeah, it's 1.12 gigawatts. Alright. And then it gets into some risks of nuclear technology. So we heard a lot about financial risks to these projects. So it goes into the ways a project can go wrong and then it talks about safety considerations for the reactors themselves. And there's a lot of concern about what do you do with the radioactive waste? How long is the half lift of this waste? There's a section on understanding radiation. So I thought it was interesting to just touch on radiation, the different types of it and the fact that we get some radiation exposure if we fly in an airplane. But there's a lot of discussion about how radiation can be very harmful and that's something that the public is very aware of.

(00:32:53):
And then it talks about nuclear waste management. So 34 states utilize dry cask facilities and we saw those at Seabrook. So it's a common convention to store the waste on site. And we saw that some of these designs incorporate that into their design where they actually store the casks as part of their design. And then after maybe 40 or 50 years they have a plan to sort of reprocess it. But that's kind of like an ongoing, not reprocess, but store it somewhere. But I think the whole concept of intermediate storage somewhere is politically not feasible currently. Right?

(00:33:47):
Yeah. Nobody wants it. Yeah. I heard a, it's not related to this, not related to our meetings, but there was a conference, it's in one of our meeting notes, the reference to it, I think from the October meeting, but there was a conference about recycling nuclear fuel, and they were saying that because it's consent based that they need one governor somewhere in the country to consent to receiving the waste so that they can set up a recycling plant for it. So apparently not one governor has done that, but that it could potentially be a very large industry. And then it talks about comparing the risks of nuclear with other energy sources on page 37.

Sen. Howard Pearl (00:34:43):
So I actually have a question about that.

Rep. Keith Ammon (00:34:45):
Yeah. So

Sen. Howard Pearl (00:34:48):
Is that tarot? Is that what TW stands for? Yeah. So how many terawatts of power do winds versus in solar do produce versus nuclear? I mean, I see they're essentially the same risk factor.

Rep. Keith Ammon (00:35:01):
Yeah.

Sen. Howard Pearl (00:35:01):
We're only creating one terawatt in wind and a thousand in nuclear. It could really be a different scale.

Rep. Keith Ammon (00:35:07):
That's a good question. It is kind of levelized towards how many terawatts they generate.

Sen. Howard Pearl (00:35:16):
So without knowing the difference between them, it would kind of be hard to assess the risk

Marc Brown (00:35:23):
Measured that based on density per active air curve ttt.

Sen. Howard Pearl (00:35:29):
Right? But you could have one death in solar and a hundred in nuclear and still have the same per 100 because you don't know how many terawatts of each are produced.

Rep. Keith Ammon (00:35:40):
That's a good question. Is that something we should add to the report?

Sen. Howard Pearl (00:35:43):
I don't know. Just that was me reading it. Yeah, that's the way my mind worked.

Rep. Keith Ammon (00:35:48):
I'm sure we could come up with another representation of that.

Marc Brown (00:35:53):
And

Rep. Keith Ammon (00:35:57):
I'll just keep going here at 38, we talk about federal regulatory considerations. So there's this new part 53 that the NRC is working on that would cover these advanced nuclear reactors, the NRC presentation. They seem very enthusiastic about moving this along, but the bureaucratic inertia is sort of holding it back.
(00:36:30):
And then on page 39, we had presentations from different federal programs. So we had a presentation from Chris Los of the GAIN program and GAIN stands for gateway for Accelerated Gateway for Accelerated innovation in Nuclear. And so he presented on the voucher system, that's part of the GAIN program. So that could be they have vouchers valued up to $500,000 with a 20% cost share. And there's different details in that section, but that could be a resource for our state. And then we heard from Julie Raki from the DOE loan programs office, and her presentation was pretty dense with information. So I'll just pause here on the top of page 40, she talked about the cost ranges. I went back through all of our old minutes and I wasn't able to get a consistent chart of all the different cost estimates from the different

manufacturers. And I sent out a survey. This may be an addendum to our report at some point, but see if I can pull it up here. I've only gotten four responses and I don't know why it's not working. It was just on, wasn't it? Could someone push the button on the remote there for the tv?

Marc Brown (00:38:14):
The

Rep. Keith Ammon (00:38:15):
TV was on, now it's not on. So there we go. You must've went to sleep.

Marc Brown (00:38:33):
Put that to your

Rep. Keith Ammon (00:38:34):
Screen. That's my screen. Yeah, I just wanted to show you, I sent out a survey to the different manufacturers. I've received some responses. Hopefully this will come up here. Yeah, you don't need, sure. Yeah. Welcome. This will just be a minute and actually it probably won't be on the YouTube. So

(00:39:18):
Can everybody see that this is a survey? We're still compiling results. So I got another response today it looks like. So I have five responses. This is not in the report, not we didn't get responses in time and there's some I still have to track down. But basically who they are, what stage is their current design? Is it less than 50? Approximately 60. Around 90. Fully complete. How do you anticipate, how long do you anticipate it will take to commence construction after the design phase is complete and there's different date ranges? Do you have plans to build a pilot plant for your project demonstration project? How do pilot plants contribute to the success of scaling up to a commercial unit? Significantly moderate, minimal, that kind of responses if applicable. Have you secured a site or partners for the demonstration project? Yes. And then there's various yes, maybe no with that kind of thing.

(00:40:25):
Engagement with the Nuclear Regulatory Commission. How would you describe your interaction with the NRC in preparing for filing a license application? Highly interactive. Moderately interactive, limited interaction. We have not yet interacted. What type of feedback or questions have you received from the NRC about your design? Detailed general questions about safety and regulations. We have not received feedback or questions. And then when do you expect to have your first non-nuclear construction permit from the NRC? When do you expect to have your first nuclear construction permit approved by the NRC? How suitable is their design to New Hampshire? And it aligns with the state energy needs and so forth.

(00:41:14):
Range in dollars. So there's the question that I asked range in dollars per megawatt hour, and then any additional information. So just briefly here, I'll click on the responses. I'll go to that question. So we can compile this as sort of like an addendum if we get complete information. But I did want to look at the range here in megawatt hours. So I've only gotten two responses and they range between 80 and 120, and then one response is $200 per megawatt hour. So I couldn't tell you without digging into it who those responses came from. But so going back to page 40, the top of the page there, Julie Raki gave us an approximate cost range. So in 2020 $3, she says 66 to $109 per megawatt hour. And then she says by 2050, they expect that to go down to 58 to $79 per megawatt hour. So this response here, the 80 to 120 is a little bit more in line with what Julie said, but a little higher. So we talked about this at our last meeting, that's the best response I could give you.

(00:42:43):

But Julie's presentation had a lot of that information in it. So we capture it here on page 40 and they expect they need approximately 200 gigawatts of new nuclear generation if the US is going to transition away from carbon. So that's a pretty big number for a new generation. And then we heard from Dr. Billy Valderrama from the department, from the office of nuclear Energy, from the DOE, and he kind of affirmed some of the other things that were said prior. And I'm looking at the bottom of page 40 here. He also referenced the new scale power module in Idaho in his presentation. And I added a little caveat there at the very end where it says no longer happening. And then on page 41, he talks about this Marvel project. It's a hundred kilowatt micro reactor. It's going to be deployed at the Idaho National Laboratory by the end of 2024. And I covered that back on page, let's see, page 13, there was a section about that Marvel project. And then he talks about the four main priorities of the office of nuclear energy. So they want to maintain the existing reactor fleet, they want to deploy new advanced reactors, they want to ensure secure nuclear fuel supply chain and they want to expand international cooperation. And he mentioned the advanced nuclear state collaborative. And I put a note to myself that I should have expanded some detail on that, but that would be an interesting thing to pursue.

Marc Brown (00:44:48):

And

Rep. Keith Ammon (00:44:52):

Then the next section, this is pretty much the same as our interim report, the recent federal policy initiatives. So it talks about some different federal legislation that is related to advanced nuclear. So we have the Nuclear Energy Innovation and Modernization Act, and that was signed into law by President Trump in 2019. We have the Infrastructure Investment and Jobs Act of 2021 that had some provisions for nuclear energy within its total 2.5 billion is earmarked for developing advanced nuclear reactor technologies. And I'll run page 42 now. The inflation reduction Act of 2022 had some aspects that applied to advanced nuclear. And then the CHIPS and Science Act of 2022 also had some provisions for nuclear. So it authorized $390 million to establish up to four new research reactors and nuclear science and engineering facilities. And then we have the International Nuclear Energy Act of 2023. And then we have the Strategic Nuclear Infrastructure Act, and I don't know if that one was signed into law. And then continuing, we had a recoup American Nuclear Global Leadership Act and then accelerating deployment of versatile advanced nuclear for clean energy, the ADVANCE Act. And that was a bipartisan group of senators introduced the bill in March, 2023.

(00:46:55):

It passed the US Senate as part of the NDAA on July 27th, 2023. And then we have some topic about, there's organized opposition to nuclear that is longstanding in our area. And we have a representative from Beyond Nuclear here. Is that right? Do you work for Beyond Nuclear. Okay. You're friends with Paul Gunter. Okay. I just made the assumption. And so it talks about, I'm sorry, go ahead. That your friends. Okay. Alright.

Sen. Howard Pearl (00:47:33):

It's also one of my constituents

Rep. Keith Ammon (00:47:35):

And also a constituent. Oh, excellent. Alright, very good.

Sen. Howard Pearl (00:47:39):

Actually I have two constituents because Alvin us.

Rep. Keith Ammon (00:47:42):

Excellent. Your mutual constituents popular. Alright, so it talks a little bit about the clamshell alliance that we have heard so much about. They were formed in 1976 and they opposed the construction of Seabrook nuclear power plant. There was an event where a large protests with civil disobedience and I think something like 1400 activists were arrested. Does that sound right?

Arnie Alpert (00:48:10):

14. 15.

Rep. Keith Ammon (00:48:12):

15. Okay. 1415.

Arnie Alpert (00:48:15):

More importantly, they frequently made me late to league games.

Rep. Keith Ammon (00:48:18):

Oh yeah, you had to go through the, and then they were ultimately unsuccessful in stopping Seabrook. Totally. But there was only one reactor developed, I think partly because of financial reasons, but some because of opposition. And then there's the C 10 Research and Education Foundation that's funded mainly by Massachusetts, if I understand correctly, the C 10, the Operate radiological monitoring network around Seabrook. So they get activated if something goes wrong at Seabrook. Okay. Alright. I won't put you on the spot. And then it talks about beyond nuclear, which we've had. Paul Gunther from Beyond Nuclear has participated in many of our meetings and they're out of Tacoma Park, Maryland. And so they're looking to, if I understand it, and you correct me if I'm wrong, they want renewable energy and they don't want nuclear. Right? Is that kind of the Yeah, so they're kind of, I don't want to say anti-nuclear, but they would rather nuclear or not proceed. They would not be

Arnie Alpert (00:49:31):

Uncomfortable with being called anti.

Rep. Keith Ammon (00:49:33):

Okay. Alright. So anti-nuclear would be accurate, but they focus on policy and advocacy. So they're active in our state as well. Alright. And then we move on to, there needs to be, if this is going to proceed further, public engagement is important and I know how do we do that? How do we engage publicly in this area? And there's a few ideas in those paragraphs there. And then just, I probably have another 10 minutes and then I'll be wrapped up. Sorry to put you to sleep. We heard from ISO New England, they put on a presentation to us and it was Eric Johnson presented to us on October. He talked a lot about the changing energy mix in the region. It sounds like a lot of our surrounding states, our neighbor states are pushing a lot of green energy policy on ISO New England. They're neutral. They don't take a position, but they do follow what states tell them to do. And so if New Hampshire has a different idea, we have to be a little more assertive with is New England to kind of counterbalance what our neighboring states are doing if our policies are different. And they seem to be, I think I heard our consumer advocate on tv, call us the redheaded stepchild of Isod England or something because our state thinks differently than other states. Don't quote me on that, but he said something like that.

(00:51:06):

So Eric Johnson went into how our energy grid is transitioning the challenges of renewable because it's renewable just tends to be intermittent. And in the wintertime we can't have the power go out because people might freeze to death and that would be not a good situation. So he talks about the need for base load power. He talked about the interconnection queue, gave us kind of like an overview of how the new ones come online. And he said that there's about 38,000 megawatts of predominantly renewable energy working its way through that interconnection queue process. That's regionally. So that was an interesting thing.

(00:51:56):

And then, let's see. So their assumption ice, new England's assumption is that no new nuclear plants will be constructed in the region over the next 40 years. So that's their assumption that they're operating on. So if this advanced nuclear industry gets off the ground, that assumption would need to change. So it was kind of good to connect with ISA New England on this topic. And then we had, I mentioned our consumer advocate. We had Donald Crease. He presented back in our May meeting, he reminded us, he said, people think that, but that's not the case. And early in his career he was involved with the Vermont Yankee plant. I think he was defending the plant against aggressive actions by the state of Vermont. And he said he thought that was wrong, that the state told the plant that it had to shut down. So that was interesting. But he said in his position he needs to be technology neutral. Well, and that our state in general is technology neutral. He said adding nuclear to renewable standards could be an option. But he said his role as consumer advocate, he has to consider who bears the cost of any potential new nuclear generation. He guards the rate payer from having additional burdens and risks put on them. And that would rule out any kind of large scale subsidies by the state. He would be likely opposed to that.

(00:53:42):

Alright, so the last couple sections, we have key findings. I think we're going to slow down a little bit just because I think these deserve a little extra attention. The key findings and then the potential state policy options. So let's, it's only a page and a half, but let's go through one at a time and see if we want to cross off anything or expand anything, because I think this will be the section that people kind of flip to. And then after that we just have the conclusion, which is basically a summary of everything we just talked about. So you want to take a minute just to read those? Let's start with the summary of key findings and just put your thinking caps on and see if there's anything missing.

Marc Brown (00:54:37):

You want to read first?

Rep. Keith Ammon (00:54:39):

Yeah. Do you want me to read it, talk about it

Marc Brown (00:54:41):

Now as we're reading?

Rep. Keith Ammon (00:54:42):

You want to read it? You want me to read it out loud or do you want to just read it?

Marc Brown (00:54:45):

No, I'm asking

Rep. Keith Ammon (00:54:47):

However you want to do it. Yeah. Oh, well let's go through 'em one at a time then you want to read 'em.

Marc Brown (00:54:54):
Sure. I guess what I had something to add in the first one.

Rep. Keith Ammon (00:55:00):
Okay.

Marc Brown (00:55:04):
Crucial role of advanced nuclear carbon reduction, advanced nuclear technologies. Essentially the role of net carbon emissions limited achieve its significantly estimate cost carbon reduction efforts. I would argue that it's not about cost, it's infeasible without,

Rep. Keith Ammon (00:55:24):
Yeah.

Marc Brown (00:55:25):
Achieving net zero is pipe dream without

Rep. Keith Ammon (00:55:28):
Nuclear expanding. Okay. So that came from one of our presentations they were talking about, I think it was truly swarovski's presentation. She was saying if nuclear is not part of the mix, then the costs just go through the roof. But you're right, it approaches impossibility. So you want to make that statement a little stronger.

Marc Brown (00:55:49):
I would just, or question that feasibility or something like that. Okay. Point out that it's not just about OP, but it's also about,

Chris McLarnon (00:55:59):
Lee could just simply add limiting its use could significantly escalate the cost of carbon reduction efforts and feasibility with current technologies

Rep. Keith Ammon (00:56:13):
And feasibility with limiting its use could consistently escalate the cost of carbon reduction efforts, potentially making it infeasible

Chris McLarnon (00:56:23):
With current technology

Rep. Keith Ammon (00:56:24):
Or something with current technologies.

Marc Brown (00:56:31):
There's a square peg in the round hole issue.

Rep. Keith Ammon (00:56:34):
Okay. I'm going to just write this in my notes and then come back to it. Alright. Number two,

Marc Brown (00:56:52):
Nuclear energy, reliability and efficiency. Inherent reliability and efficiency of nuclear power, particularly in terms of grid stability and frequency response.

Rep. Keith Ammon (00:57:06):
It's kind of a generic statement, but

Marc Brown (00:57:18):
Do we want to add, so you mentioned earlier about new reactor technology has the ability to load follow,

Rep. Keith Ammon (00:57:28):
Right? Yeah. Well

Marc Brown (00:57:29):
Generally what we have in this country can't load follow, right? Seabra can't load follow. It's a base load plant. They fired it up, it runs. And that's, unless I'm wrong, but I know you can move a little bit, but

Matthew Levander (00:57:41):
Yeah, I think seabra probably could load follow. I think economically it's not viable the way that they sell power.

Marc Brown (00:57:47):
Okay.

Rep. Keith Ammon (00:57:48):
That's my understanding. It could put additional stresses on the whole system. Right? If you change

Matthew Levander (00:57:52):
The fuel gets stressed,

Rep. Keith Ammon (00:57:55):
Could you put your mic on?

Matthew Levander (00:57:57):
I believe that the fuel is what gets stressed

Marc Brown (00:57:59):
If the

Matthew Levander (00:58:00):
Fuel gets,

Marc Brown (00:58:00):
If you try to load follow,

Matthew Levander (00:58:01):
I don't think it's an issue with the fuels. It's purely, I think it's purely economics is my understanding because everything is designed to run for 18 months. So they put a certain amount of fuel in. So there are challenges with moving the plant up and down, but I think it could be done.
(00:58:17):
Technically possible, I think economically.

Rep. Keith Ammon (00:58:23):
Okay. Did you want to make a change to number two?

Marc Brown (00:58:27):
Well, given that, I don't know, maybe not.

Rep. Keith Ammon (00:58:32):
So it talks about grid stability, that's sort of the main point there. Is that right? That's an important feature that we all depend on, right?

Marc Brown (00:58:40):
Yep.

Rep. Keith Ammon (00:58:46):
Okay. With number two.

Marc Brown (00:58:47):
Number three, progress in nuclear fuel recycling. The development and implementation of spent nuclear fuel recycling methods are important steps forward in nuclear waste management. So

Rep. Keith Ammon (00:59:04):
I have notes to myself after I read it again talking, adding something about economic viability and avoiding proliferation risk. I think adding those two things to that one would round it out works.
(00:59:25):
Is that alright? Alright.

Marc Brown (00:59:31):
Number four, innovation in nuclear business models. The emergence for innovative business models for advanced nuclear technologies is a notable trend such as the power as a service model.

Rep. Keith Ammon (00:59:44):
So several of these manufacturers talked about they would continue to own the plant and they would basically sell the power to customers so they would be responsible for any maintenance and ultimate decommissioning of it. That seems very ambitious, but that's what several of 'em said.

Marc Brown (01:00:04):
I don't see I need to change it.

Rep. Keith Ammon (01:00:09):
It's good to go. Okay.

Marc Brown (01:00:13):
Number five. Modernizing nuclear licensing processes efforts are underway to update and streamline the nuclear reactor licensing process, focusing on achieving a balance between flexibility and predictability.

Catherine Beahm (01:00:30):
Should we say something in there about still ensuring safety and all of that that the nuclear regulatory commission pointed

Rep. Keith Ammon (01:00:35):
Out while ensuring safety? Yeah, I agree with that. That's really the NRCS main job.

Marc Brown (01:00:48):
Maybe focusing on achieving a balance between flexibility, safety, and predictability or something like that. Just to keep it simple. Can you balance three things?

Rep. Keith Ammon (01:00:55):
Yeah, that's right. The three body problem. All right. I'll add safety in there between flexibility and predictability.

Marc Brown (01:01:07):
Number six, learnings from advanced nuclear projects. Key lessons include the importance of complete design development before construction, collaboration with experienced contractors and ensuring a robust supply chain.

Rep. Keith Ammon (01:01:20):
So we had, was it Westinghouse? They talked a lot about lessons learned from the Votgle plant because that went way over budget and it was eventually successful, but in economic terms it was a big cost overruns. And so they said a little bit, I mean if you average it out over 80 years, maybe it's not so much, but

Marc Brown (01:01:45):
The initial over the life of the plant, it's going to be valuable. But from a net present value basis,

Rep. Keith Ammon (01:01:51):
It's probably not. But they talked a lot about some of their partners in that project were not as experienced as they maybe could have been. And that's the whole, it's kind of a separate chicken and an egg thing, is that you need a lot of high skilled labor to build these projects. They're not being built for decades. And so how do you start up that whole experience cycle?

Catherine Beahm (01:02:24):

I don't know if this is where you'd want to put it, but they talk about if you're the first of its kind and you'd make first of a kind of 20 different projects, you're not going to save money, but you have to find one and go with it kind of thing. I dunno if this is where you want it or if you talk about that

Rep. Keith Ammon (01:02:38):

Somewhere else, we could put that there. So achieving nth of a kind, I think is the term they would use. So you get efficiencies, economies of scale. If you've ever put together an IKEA bookshelf or done something first of a kind in your house the first time takes you five hours and you do it wrong, but the second time you do it, you can do it like that. Right?

Matthew Levander (01:03:10):

I think that might fit under number A too for cost competitiveness for,

Rep. Keith Ammon (01:03:17):

Okay. Yeah, actually, let's put it there. Does that sound right?

Marc Brown (01:03:27):

Seven Advanced reactors combining novel technologies, innovative reactor designs are being developed that combine high temperature operations, thermal energy storage with enhanced fuel stability and safety.

Rep. Keith Ammon (01:03:45):

We good? Yeah, I mean it's a generic statement, but

Marc Brown (01:03:50):

Goal for cost competitiveness with fossil fuels. There's an industry-wide goal to make advanced nuclear reactors cost competitive with fossil fuel power plants without relying on subsidies.

Rep. Keith Ammon (01:04:01):

So we heard that from several manufacturer. I'm sure they'd all love subsidies if they could get them, but we sort of said that we're not friendly to subsidies. So I think some of them may have tailored their presentation to us. So that last part, without relying on subsidies, I think that reflects at least several of the presentations that we heard. Everybody good with that one?

Marc Brown (01:04:27):

Number nine, target for commercial deployment by 2030. Many in the industry claim, excuse me, aim to achieve commercial deployment of advanced reactive technologies by 2030 or earlier. I think that reflects the camera plant. I think they're,

Rep. Keith Ammon (01:04:41):

They're 2028.

Marc Brown (01:04:44):

I know the coal plant's going to retire in 25.

Rep. Keith Ammon (01:04:50):

Let's see,

Marc Brown (01:04:55):
2030 I think is a good,

Rep. Keith Ammon (01:04:57):
That's terra power. That's on page 14. It's slated for retirement in 2025. It doesn't have a date for when they're coming online.

Marc Brown (01:05:13):
I think 2030 reflects a lot of what we've

Rep. Keith Ammon (01:05:15):
Heard. Most of them we, we've heard some say late 2020s, but we know how these dates tend to slip. Right. So, alright,

Marc Brown (01:05:27):
Number 10, emphasis on high efficiency electricity generation. Advanced reactors are being designed to maximize electricity generation efficiency.

Rep. Keith Ammon (01:05:41):
So what do we mean?

Marc Brown (01:05:45):
Is that a heat rate thing? Is that

Rep. Keith Ammon (01:05:47):
A, so getting more energy out of the fuel than potentially some of the older plants do. And Matt, I don't know if you want to expand on that but

Matthew Levander (01:05:58):
Yeah, so the gas plants that run at a higher temperature can get more fuel out or more energy out. My personal opinions and my dilute the rest of the findings, my recommendation would be to take it out.

Marc Brown (01:06:11):
I agree. Take it out. Alright. Yeah.

Catherine Beahm (01:06:15):
Would it be changed to say the modular and smaller reactors allow for localized energy generation, which will improve efficiency because a lot of it's lost in the lines, right?

Marc Brown (01:06:27):
But it's not about the line. I don't think we're getting at, it's not about transmission line losses here. It's about the efficiency of the reactor or in a case of a gas plant, the thermal

Rep. Keith Ammon (01:06:38):
Right extracting is more energy out of the fuel than

Marc Brown (01:06:41):
The energy loss in the procession of the energy to electricity. Right?

Rep. Keith Ammon (01:06:48):
Exactly. So should we cross it out?

Marc Brown (01:06:53):
In my opinion, I would get rid of it. Opening up discussions to, like I said about heat rates, right? The most efficient natural gas plants are like 60% efficient. The code. Yeah. So let's the GE turbines.

Rep. Keith Ammon (01:07:10):
Alright, so I'm going to scratch number 10. Yeah. Alright. You want go to 11.

Marc Brown (01:07:19):
11. Okay. Sorry, I go lost 11 strategic approaches to reactive, develop strategic development approach, prioritizing rapid learning and innovation is being adopted across the industry.

Rep. Keith Ammon (01:07:38):
Again, very generic.

Marc Brown (01:07:39):
I think that works. Number 12, commitment to commercializing advanced nuclear. There's a broad commitment to the commercialization of advanced nuclear technologies signaling a potential transformation in the energy sector. And the only thing I would say, do we want to add partnering with large energy consumers? We know if you talked about with the data centers, they're looking, that is something they're actively looking into large industrial consumers looking at advanced reactor technology or do you think that's already covered?

Rep. Keith Ammon (01:08:15):
I think that might be its own. What if we replace number 10 with that thought where large data centers are

Marc Brown (01:08:23):
Looking, I would just fit large industrial users or heavy or high load or I don't know, however you want to phrase it, but big energy consumers are looking at advanced nuclear. A lot of them want to be carbon neutral, like the new core, new scale. MOU is an example of that. I don't know where that's going to end up now. But

Catherine Beahm (01:08:57):
Would you want to include broad bipartisan commitment? Because it seems like both sides are pushing legislation that is assisting in this, or is that not what your point was in 12?

Marc Brown (01:09:08):
I think it makes it political at that point. I don't think we,

Rep. Keith Ammon (01:09:12):

We could add something about that back in the section that talks about the different legislation.

Catherine Beahm (01:09:18):
Yeah,

Rep. Keith Ammon (01:09:20):
Because go through and see who the sponsors are, but I'm pretty sure there's example. I mean the inflation reduction act was pretty much the Biden administration, but it was bipartisan. I could put, is that all right? Putting it there if it's not there already. Lemme just refresh my memory here.

Catherine Beahm (01:09:46):
So are you referring in 12 to between the reactor producers and you okay with those, the energy users? Is that what you're trying to get to?

Marc Brown (01:09:56):
Yeah, that's a good point. Hey Keith? Yeah, on 12, maybe change it from broad commitment to broad interest.

Rep. Keith Ammon (01:10:07):
Okay.

Marc Brown (01:10:07):
I'm not sure that there actually has been any financial commitments made.

Rep. Keith Ammon (01:10:11):
Okay.

Marc Brown (01:10:12):
Yeah,

Rep. Keith Ammon (01:10:19):
So it was back on page. I'll just add it there. There's page 41, recent federal policy initiatives. I'll add the word bipartisan in there. Is that alright? And I'll find a good spot for it. And what I'll do is I'll track changes on the word document. I'll update based on what we discussed here, I'll circulate the track changes so you can see exactly what's different and then we will release it after that. Does that sound all right? And Mark, if you have suggested language, we will throw that in there of these. So the last I heard was we'll change commitment to interest on number 12. Yeah,

Matthew Levander (01:11:24):
I had a couple other items that, just for general consideration. So one would be, we had a lot of talk of deregulated versus regulated markets and how most likely any new nuclear is going to be in a regulated market, at least at the beginning. Is that worth including in this section?

Rep. Keith Ammon (01:11:42):
It's in one of the, in this section. So it's covered in the consumer advocates section. And then in the most recent, I want to say it was Moltex's presentation, not nuclear. They mentioned trying to figure out where

it is in the document. They mentioned that, I'll have to search for it. He mentioned that most likely it'll be in a vertically integrated market first. Right? Yeah.

Matthew Levander (01:12:26):

I'm just wondering if you're saying, okay, well the customer for this report, if you said, okay, well what do I want to take away? One of the things is most likely you're not going to get a new nuclear plant in a deregulated market by the 2030. So you're going to be much later, you're going to be ends of a kind versus first of a kind. Once there's more certainty and utilities understand what that cost looks like.

Rep. Keith Ammon (01:12:56):

Yeah. I mean, unless it's privately funded, right? Yeah. I mean if I understand, David, if we had approval for a micro reactor, say let's say it's commercially available, you could put one on your industrial site somewhere in New Hampshire as long as it was approved by, there's no, it would just be a funding an issue of capital at that point. Right? Citing

Marc Brown (01:13:27):

There's no prohibition. I think what I don't want to speak to you, but what you're asking is there's no prohibition on an industrial consumer entering into A PPA with a generator.

David Shulock (01:13:36):

Correct? Right.

Rep. Keith Ammon (01:13:37):

So I mean that's a possibility, but it's kind of low probability. Right. Alright, so you, we'll put something about the likelihood of first of kind going into a regulated market as opposed to

Matthew Levander (01:13:56):

Yeah, I don't feel super strongly about it. So if the rest of the commission doesn't think it belongs there, I'm fine. I just seem to me that it might be relevant.

Rep. Keith Ammon (01:14:05):

We had a few people make that point.

Marc Brown (01:14:09):

You're seeing it with almost right now. So I think that's fair. Offshore wind, utility skills, solar, none of those are getting built on market revenue. They're all getting built in PPAs state supported contracts. So I think that's a fair statement to make.

Rep. Keith Ammon (01:14:31):

Alright, I'll draft something up when I can sit and think about it and then, but I'll go back through and see what different comments were made. I think Representative Harrington couldn't be here today. He has some thoughts on that and he's brought up that point a few times. I'll go back and look exactly what he said. Alright, any other items and the key findings, we'll update those. Alright, so last, well before we get to the conclusion, we'll look at potential state policy options. Mark, do you want to read through those?

Marc Brown (01:15:12):

Yeah, I'll keep going. Okay. An enact legislation for clean nuclear energy designate nuclear as a clean technology under renewable portfolio standards and other state clean energy programs aligning with New Hampshire Department of Energy's 2021 State Energy Strategy on page 56.

Rep. Keith Ammon (01:15:29):

So there's a link in the document that goes to their energy strategy. If you want, I can pull up what they said.

Marc Brown (01:15:35):

These aren't necessarily recommendations from us, Keith. These are just, we're just throwing out

Rep. Keith Ammon (01:15:40):

Options.

Marc Brown (01:15:42):

Some options that policymakers could take a look at.

Rep. Keith Ammon (01:15:45):

Exactly. Right. I mean, that's really all we can do anyway, right?

Marc Brown (01:15:48):

We're not making any solid recommendations. This is our preferred path forward.

Rep. Keith Ammon (01:15:54):

Well, let's go through the whole list and see. I don't think we're kind of limited in what we can do. And actually there's a few pieces of legislation that match up to a couple of these that I can talk about, right.

Marc Brown (01:16:18):

Two feasibility sites for advanced reactor sites conduct studies to identify suitable sites for advanced reactors focusing on potential applications in end users like industrial facilities or retired coal and biomass plants.

Rep. Keith Ammon (01:16:34):

So the feasibility studies could be done by maybe the Department of Energy or we talked about Dartmouth is potentially going to look at some of these things. I dunno if you have any thoughts on that. David. Is number two a good recommendation?

Marc Brown (01:16:59):

My concern would be if you're getting utilities involved with load capabilities and what they might need to do to upgrade their systems, is that going to be costly to them, time consuming to them? Or do you think it can be done without involving you to, I guess that's my question. Do you think that something like this could be done without involving utilities or feasibility studies and that sort of thing does? That's something that would have to probably be approved by the PUC.

Rep. Keith Ammon (01:17:31):

So some of these federal programs like retiring coal plants, we have one coal plant in our state. They're looking for that specific situation and they're willing, the coal nuclear stuff, they're the coal nuclear transition. They're willing to help out with that. So we'd have to investigate to see exactly what resources are available. But that may be one option,

Marc Brown (01:17:56):

Knowing that that works for me.

Rep. Keith Ammon (01:18:04):

Is that all right? Okay.

Marc Brown (01:18:06):

Financial incentives for nuclear projects identify potential federal financial support through grants loans and tax credit, facilitate advanced reactor demonstrations of deployments while being mindful of potential political resistance in New Hampshire.

Rep. Keith Ammon (01:18:21):

So this is the free federal money tree. I guess it's something that we could pursue potentially. I know we're stingy except for when the federal government's going to give us though. Seems to be the ethos here.

Sen. Howard Pearl (01:18:45):

So would that be a state policy option then?

Rep. Keith Ammon (01:18:51):

Well, policy could be departments pursuing it, right? The executive branch could pursue it.

Sen. Howard Pearl (01:18:59):

It seems like

Marc Brown (01:19:00):

They would. That's a good question actually.

Sen. Howard Pearl (01:19:02):

It seems like they would be doing it if, isn't that more of a private sector initiative more than a state?

Rep. Keith Ammon (01:19:13):

I mean, I could see

Matthew Levander (01:19:14):

Could be for a state university or something like that if it was, the GAIN program specifically is for research. So if it was like Dartmouth or UNH or something like that, I'm out of my depth of knowledge. But I would think potentially it could be.

Rep. Keith Ammon (01:19:28):

Yeah. I mean similar to you. It sounds good what you're saying. Do we want to modify what we're we're saying in that

Marc Brown (01:19:38):
Instead of identify, then maybe utilize potential federal financial support. Maybe I

Rep. Keith Ammon (01:19:48):
Identifying would be the first step. We're trying

Marc Brown (01:19:50):
To

Sen. Howard Pearl (01:19:51):
Go find that information.

Rep. Keith Ammon (01:19:54):
Right?

Marc Brown (01:19:55):
That's really what the effort to

Sen. Howard Pearl (01:19:56):
Find it,

Rep. Keith Ammon (01:19:57):
Right? Like drill down in that one area.

Marc Brown (01:20:01):
I don't have a problem with keeping it, but I understand what Senator Pearl's getting at.

Sen. Howard Pearl (01:20:07):
Maybe you could combine that with number seven with your nuclear development coordinator. That could be your

Rep. Keith Ammon (01:20:14):
Duty. Number seven, when we get to it, that has been in state statute for decades, and I had someone in the governor's office looked into it for me, and it hasn't been filled since 2007, the position and the person that was in it last passed away. So we can't even talk to him. They've never, yeah. So I don't know if David's seen my bill yet.

Sen. Howard Pearl (01:20:43):
I'm allowed to say

Rep. Keith Ammon (01:20:45):

You're not allowed to say it hasn't been released yet, but there's a bill to sort of update that section and put it under the Department of Energy, which I think would be a good home for it. So the coordinator was supposed to inform the governor and the executive council twice a year for going back to the fifties, I think. And that hasn't been done. So I think if I recall correctly, I put in a five-year cycle where it would be

Sen. Howard Pearl (01:21:14):

This.

Rep. Keith Ammon (01:21:16):

Sure, sure. So when I present Bill, I'm going to say, if you don't want to do this, then repeal the statute because nothing bothers me more than statutes that aren't unfollowed. So anyway, it is a discussion that I'm sure we'll have. But that's number seven, right? That's what that's related to. So you were saying combine those two?

Sen. Howard Pearl (01:21:47):

Well, if you're going to have a state weekly development coordinator, one of the duties would be to seek out and finds what available potential grants are there. Nature kind of be a task of, it's more than a state policy.

Rep. Keith Ammon (01:22:12):

So I'd have to go look at what the statute actually says. I

Sen. Howard Pearl (01:22:20):

Mean, I'm okay, you can lead this here. I just,

Rep. Keith Ammon (01:22:23):

Do you want to put it, can I move it after that one? So if I move three to number eight and then kind of refer back to the previous one, maybe

Sen. Howard Pearl (01:22:35):

Even combine Make it I don't, Keith. I'm okay.

Rep. Keith Ammon (01:22:40):

Yeah, I'm just trying to think.

Sen. Howard Pearl (01:22:42):

I thinking more of what the state's role is in doing this.

Rep. Keith Ammon (01:22:55):

I guess I kind of want to keep it, but that's fine. I'm okay with it. It's sort of like a, I don't have any hardship, hard objection to it or anything. I made a question, we had the conversation, but I'll move it until after seven and that way it's sort of, and I'll reorder it, connect them all. They do seem related. I just see that as if this is going to happen, that's going to be a piece of it. Right.

Marc Brown (01:23:22):

Number four, workforce development and public awareness. Implement workforce training programs and public awareness campaigns, foster talent pipelines, and increased public understanding of nuclear technology. You would probably have the biggest input on this one.

Matthew Levander (01:23:37):

Yeah, I think industry-wide, whether it's utilities or the nuclear regulatory commission, there's a talent shortage out there for people with engineering degrees or backgrounds in this. And because most of the plants were built in the seventies and eighties, a lot of the workforce that have worked for 30 plus years are retiring. So it's definitely something that if this industry is going to grow, there's a shortage of talent for sure.

Rep. Keith Ammon (01:24:01):

Yeah.

Marc Brown (01:24:04):

Do you see there being issues down the road with just having the labor to support the plant itself operationally? Or is that not something you're concerned about

Matthew Levander (01:24:15):

Right now? No. I would say draft workers like electricians and mechanics and stuff. We have those people. It's more engineers and the people that work in the control room typically have engineering degrees where they come out of the Newport Navy. But yeah, the industry's struggling for talent.

Rep. Keith Ammon (01:24:36):

So we're good with that one.

Marc Brown (01:24:40):

Number five, streamline licensing and permitting process. Simplify and expedite advanced reactors, licensing and permitting processes, reducing regulatory delays.

Catherine Beahm (01:24:52):

Is the state policy or is that more of a federal

Matthew Levander (01:24:55):

Policy? I was going to say, what's the overlap there?

Rep. Keith Ammon (01:25:00):

Well, so the state has its own atomic energy statutes, right? They're tied to the federal statutes. So I don't know, David, do you have any thoughts on, is that

Marc Brown (01:25:19):

From a licensing perspective? That's a federal thing, I think, right? I mean the state's not going to license a facility, does it? Or does it?

Matthew Levander (01:25:27):

I don't think it licenses a facility, but there is the Department of Environmental Services, or there's other stuff that the state does interface with nuclear facilities on.

Rep. Keith Ammon (01:25:36):
You mentioned citing have

David Shulock (01:25:38):
To, would've to go through,

Marc Brown (01:25:42):
But that'd be more permitting, right? Not licensing per se, or do you think there's overlap

David Shulock (01:25:55):
Whether the federal,

Rep. Keith Ammon (01:26:25):
Hey, David, would you mind just turning your mic on and just repeating what you said? Just because it's being streamed. That's all.

David Shulock (01:26:35):
I would have to go back and check. But I do think they would have to go through the siting process with the site evaluation committee. And that process is constantly being streamlined.

Rep. Keith Ammon (01:26:49):
So some of these recommendations came from our discussions, but also, I'm just going to jump ahead to, let's see, where is it?

Sen. Howard Pearl (01:27:10):
While you looking, I'll just say this. I don't see any problem with number five, whether we really have a lot of state licensing control or if it's more permanent. I don't think the statement is wrong. I think it's fine. We'd want to streamline whatever involvement we have.

Rep. Keith Ammon (01:27:26):
It works for me. Maybe it's not in my copy. Do you guys have one that talks about, can I see your copy of statement? The NEI what? I'm trying to find. The NEI. There it is. Number nine. Why can't I see that on mine? Oh, it is on mine is from an old toner cartridge. You guys got the new toner cartridge? So the NEI has a whole list of recommendations for policy, and some of these came from those suggestions, and there's a link in the digital copy that goes to their document. It has a whole bunch of different recommendations. That's what I wanted to just point out. That streamlining, I believe, is from their recommendations. Number six,

Marc Brown (01:28:23):
Invested nuclear supply chain capabilities promote public and private investments in the nuclear supply chain, including component manufacturing.

Rep. Keith Ammon (01:28:34):

So we probably want to scratch out public and then maybe a different word besides promote,

Marc Brown (01:28:42):
Encourage,

Rep. Keith Ammon (01:28:44):
Encourage. I mean, the governor does ribbon cuttings all the time, right? There's promotion of private industry by the state. So you want to say encourage, take out the word public. Check

Marc Brown (01:29:01):
Out public,

Sen. Howard Pearl (01:29:02):
Sorry.

Rep. Keith Ammon (01:29:03):
So number six, we're going to change promote to encourage, and then scratch public investments,

Sen. Howard Pearl (01:29:16):
Encourage private investments in the nuclear supply chain, including component. Yeah. I don't know that we're going to make any public investment as a state into it. I would agree with it.

Rep. Keith Ammon (01:29:26):
Yeah. So I mean, public could be the federal government, and we know that this is a national security. There's a national security implications for building up the, but it's not a state policy.

Sen. Howard Pearl (01:29:40):
I guess there'd be no issue with leaving public in that case. We can encourage it with a resolution or something if we

Rep. Keith Ammon (01:29:45):
Chose to. We can encourage it

Sen. Howard Pearl (01:29:47):
If you change to promote, encourage, whatever.

Rep. Keith Ammon (01:29:50):
I could add the word federal in there just to,

Marc Brown (01:29:55):
I mean, it goes back to federal incentives. If there's federal incentives to expand rail or port or whatever for manufacturing facility, the state's probably not going to say no to it

Sen. Howard Pearl (01:30:08):

Right now. Again, we got to remember, these are just options, right? It's an option that we could encourage it. So don't, we're not saying the state should do this. We're just saying the state could incur it

Rep. Keith Ammon (01:30:21):

Or Yeah. Look out for opportunities to do it. Right.

Sen. Howard Pearl (01:30:25):

Alright. However you want to. Word that's okay with me. Okay.

Marc Brown (01:30:29):

Number seven, appoint a state nuclear development coordinator, revive the coordinate of atomic development activities position from a 1955 state statute to advise and manage pro-nuclear policies, initiatives, guiding the legislature, executive counsel and government.

Rep. Keith Ammon (01:30:47):

Yeah, I could pull up that statute if you guys want. I mean, it's one of the few things that we sort of uncovered in our, it's long been forgotten about. I believe the fact that it's in our statutes, but why isn't it coming up? I have software

(01:31:28):

Here. It is a coordination of studies. I think that's the one I, the governor and council shall appoint the head of one of the state departments concerned as advisor to the governor with respect to atomic industrial development within the state as coordinator of the development and regulatory activities of the state government relating to the industrial and commercial uses of atomic energy as a deputy of the governor. And matters relating to atomic energy, including participation in the activities of any committee formed by the New England States to represent their interest in such matters. And also cooperation with other states and with the government of the United States, the department head, so appointed shall have the additional title of coordinator of atomic development activities. And then there's a few responsibilities there. So that's what that's related to. And I think it's just good to have a discussion about it. Right? It's in the statutes. Let's update it or eliminate it. Right? Any thoughts on that? I'm fine. Alright. Number eight,

Marc Brown (01:32:42):

Legislation to update atomic energy statutes, draft and propose legislation to update the state's chronic energy statutes incorporating the federal definition of advanced nuclear.

Rep. Keith Ammon (01:32:52):

So I have a bill submitted. I think you're a co-sponsor on it. Am I? So we heard from one of the, it could have been the NE, I think it was an E. They suggested that there's a federal definition of advanced nuclear, I don't know if I could pull it up off the tip of my fingers, but it has a whole list of advanced nuclear. And to tie our state statutes to that definition, putting it in our state statutes so that there's an anchor point. So for any future legislation, it's part of our statutes. So in that update, there's a minor refresh to our statutes, and that's included in that bill hasn't been released yet. But

Marc Brown (01:33:36):

Number nine, consult state policy suggestions by NEI. Nuclear Energy Institutes, or NEI compiles reports on potential state policy options for states to support nuclear energy.

Rep. Keith Ammon (01:33:49):

So just real quick, there's a link in the document that goes to that, and we hear legislators talking about promoting nuclear, and this would be a good place for them to look in this document here, see if I can, I dunno how to make it full screen. But it talks about policy options. And again, they're not all, so state climate and carbon reduction policies, state energy policy, energy planning, capital markets, transmission infrastructure. So it's a nine page document that's fairly recent. This points people to that document basically.

Marc Brown (01:34:42):

Perfect. Number 10, reevaluate New Hampshire's participation in the NRC agreement State program. The NRC assist states in establishing programs to assume regulatory authority under the Atomic Energy Act of 1954, allowing states to license and regulate various materials. This assistance includes reviewing requests for agreements, conducting training and evaluation, and coordinating event reporting with agreement states. Currently 39 states have such agreements including New Hampshire.

Rep. Keith Ammon (01:35:14):

So reevaluate. I dunno if there's much discussion about this in the Department of Energy or in the PUC. I mean, does this ever come up? See if I can pull it up here. So this goes to the NRCS website. They have a page about New Hampshire. There's a link in the electronic document that goes to this and it has all information about, so Augustin A, is that currently a person in the department of He's the administrator of radiological health section department

Catherine Beahm (01:36:02):

Public health. I can't read it from here. Is

Marc Brown (01:36:05):

Public health Ennis,

Rep. Keith Ammon (01:36:06):

Let's see if I can make it bigger.

Catherine Beahm (01:36:08):

Is that public health? Is that what you're talking about?

Rep. Keith Ammon (01:36:11):

Yeah, this is the information on, there. It is.

Catherine Beahm (01:36:14):

Yeah. It's Department of Public Health of the Health and Human Services. I don't know. I know Robert Ton is correct. Right? I'm not sure what Michelle reversed title is.

Rep. Keith Ammon (01:36:29):

And here's the link to our, this is the agreement that our state has signed with the NRC. So the idea is maybe we need to go back and re-familiarize ourself with this. Is that a good idea? And maybe there's resources through those relationships, right, that we could utilize

Marc Brown (01:36:54):

Number 11 S, the NRC to review and approve licenses. State legislature could pass resolutions urging the Nuclear Regulatory Commission to not delay license approvals for advanced nuclear projects.

Rep. Keith Ammon (01:37:05):

So this would be just one of those house resolutions that go into the circular file somewhere in dc, but it could raise awareness about it. Do you want to expand that at all?

Marc Brown (01:37:21):

No. Number 12, urge ICE and New England to seek advanced nuclear proposals. While Iceland, new England remains neutral on energy generation, it does take direction from member state policy cues.

Rep. Keith Ammon (01:37:37):

So this was Dick Berry's suggestion. Dick. I served on the science technology and energy committee when he was the chairman, and he's very knowledgeable about this stuff. His thought was, why don't we tell ISO New England to pursue this stuff? And I don't know if we can do that or not, but

Marc Brown (01:37:59):

I mean you could put it in here, but there's no mechanism for them to push one technology really over another. They approve tariffs and so much markets. I mean,

Rep. Keith Ammon (01:38:16):

So our neighboring states are pushing carbon net zero policy, and we're sort of getting muscled around by those other markets. I guess if we said net zero has to include nuclear, advanced nuclear and put that into the conversation regionally, is there a way to do that? See what I mean?

Catherine Beahm (01:38:40):

The other states's pushing it through subsidies to the solar and wind, which makes their economics on ICE and New England look better.

Rep. Keith Ammon (01:38:46):

So probably

Catherine Beahm (01:38:48):

Through that mechanism, not necessarily to the policy itself.

Marc Brown (01:38:51):

I mean, that's how they're doing it. That's what I said earlier is none of the wind farms that have been built in Maine, even the ones in New Hampshire are relying on PPAs and all the offshore wind contracts. I think between two developers, they just paid a hundred million dollars in penalties to get out of the agreements. Wow. Because finances don't work anymore. So it's all out of market. As far as what's getting developed right now on a large scale. I mean, if anybody sees anything differently, know that's all I see.

Daniel Goldner (01:39:35):

I'll add, I think I agree. I think the overarching encouragement ISO New England could still happen. We could write letters and we could encourage them to consider the New Hampshire position, which is

different, I think, than the other states. But I also agree that ultimately it's a PPA, somebody has to pay for the technology. So both things are true.

Rep. Keith Ammon (01:39:58):
Okay. Would you modify that or eliminate it? That number 11 or 12? I'm sorry.

Daniel Goldner (01:40:04):
Yeah, I'd keep it, I mean, I think encouraging ISO New England is different than getting a result from ISO New England. So letting 'em know what our state policy is and the direction we're going. They want to please us and so they'll be interested in our position. But it's also true that they respond to PPAs and that's how they do business. So I think both things are true. I would leave it in there. Leave

Rep. Keith Ammon (01:40:31):
It in. Okay. Any caveats? I mean, I put they're neutral and they take direction from member state policy.

Marc Brown (01:40:41):
I idea. That's true. It's

Rep. Keith Ammon (01:40:42):
True.

Daniel Goldner (01:40:43):
Yeah.

Rep. Keith Ammon (01:40:45):
So I mean, there may be ways to assert if our policy direction is different than our surrounding states if we just a little more assertive with it just to make sure that our interests are tracking.

Daniel Goldner (01:40:57):
Right. I think that's right.

Rep. Keith Ammon (01:40:58):
Okay. Last one.

Marc Brown (01:41:01):
Number 13, declare nuclear energy in the state's national interests. State legislature, pass resolutions, declare nuclear energy, be in the state and national interest.

Rep. Keith Ammon (01:41:12):
Again, another resolution, but I don't know else. You

Marc Brown (01:41:15):
Guys are the legislators, so if you want to

Rep. Keith Ammon (01:41:17):

Go for it. There's two resolution items. Do you have any thoughts on those?

Sen. Howard Pearl (01:41:22):
13.

Rep. Keith Ammon (01:41:23):
13. And what was the other one? 11. 11 and 13 are kind of related. Maybe I'll put those next to each other.

Sen. Howard Pearl (01:41:38):
Well, we certainly can, if that's what we decide, that we can certainly create resolutions that we decide that's the interest of the state and what we want to put forward. So I don't disagree with either statement.

Daniel Goldner (01:41:53):
And if we're signaling that we're friendly to these businesses, I think that's an important market signal. If the legislature makes such a statement, that would be important for ISO New England to know. So it all kind of connects to each other, but that's an important market signal to send, I think.

Sen. Howard Pearl (01:42:11):
Yeah. I guess it depends on who you're sending the resolution to. Really.

Rep. Keith Ammon (01:42:16):
Yeah. Well I guess it would be to the federal government, right?

Daniel Goldner (01:42:19):
I

Rep. Keith Ammon (01:42:20):
Congress. Right? Yeah.

Daniel Goldner (01:42:22):
I mean from a site evaluation committee model here in New Hampshire, we have nothing in front of us. We are viewed, I think as a state that's not friendly to power generation of any kind. And so if it's important to the legislature to send a message to the market that we are open for business, then those kinds of messages are important. Okay.

Rep. Keith Ammon (01:42:46):
It does have some effect, as you're saying. It does. Yeah. Next time we vote on a resolution.

Daniel Goldner (01:42:51):
Yeah, people are watching closer than people think.

Rep. Keith Ammon (01:42:58):
Oh, I don't know if I mentioned this, but on Monday, so Representative Michael Vose is the current chair of science technology energy, and he let me know about a program that's run by the National, national, I want to say council, but it's not council conference, national Conference of State Legislators, NCSL. Next

week they're running a program on state nuclear policy. So I'm going to go down to North Carolina on Monday and we're going to talk to other state. I have no idea what to expect, but we're actually going to take a tour of a plant down there. So I'll report back to the group what I find out next week, but we'll send some signals that way.

Daniel Goldner (01:43:49):

Dumb. So

Rep. Keith Ammon (01:43:50):

Yeah. Alright. So this is a good point to ask. Is there anything missing from these recommendations? And I'll open it up to our audience members here, our guests in the room, if you've had a chance just to look at those 13 items and if there's anything else that we're missing. I didn't see it. Okay. nie, did you say? No? Right. There's always going to be something that was overlooked. Alright. Anything else we'd like to add to that?

Marc Brown (01:44:30):

The only thing I would say is I've had the opportunity to be all over the country over the past year, and one of the debates that's being had, and they had the debate at nru, is our market's broken right now when it comes to electricity. And as I spoke to earlier, nothing's getting developed based on market revenue for the most part in New England. They're all out of market contracts. Whether you agree or disagree, it doesn't matter. That's kind of the facts. So is that, that conversation is being had, does that bode well for nuclear or not? So the more you have out of market contracts, the more you suppress wholesale market prices. Right. And

Rep. Keith Ammon (01:45:23):

Distorts the market reduce.

Marc Brown (01:45:25):

You guys know all about this, so what's the future look like? And we probably can't get too involved in that, but I just wanted to raise it because it is an issue and it is one that, again, we haven't developed a nuclear reactor in a deregulated jurisdiction ever. Does it have to be? Because if we're going to just move forward with all bilateral PPA contracts, I don't know. I'm throwing stuff out there. But I mean, so

Rep. Keith Ammon (01:45:57):

How would you put that into,

Marc Brown (01:45:58):

I don't know, it's, I don't know if it's just a kind of a sidebar. There's a discussion about our markets deliver high signals that properly incentivize level playing. And that's the question that's out there right now. And it's not partisan. There's folks that have long supported markets that are realizing that maybe they are broken and we need to kind of look at something else. I don't know. I really know how to put it into words. I just wanted to raise it with the group and see if that's something that, it's probably a whole separate discussion. But it does impact nuclear.

Daniel Goldner (01:46:41):

I think I would just say the legislature has lots of options available to them. Unit till today is building a five megawatt solar. And so you could say, well, it's okay to build a 250 megawatt nuclear reactor. I

mean, the legislature has options available to it. Right now you've capped it at five megawatts, but there's nothing that says you couldn't change that.

Marc Brown (01:47:06):
That's a, and maybe that's a possible policy recommendation to look at that's going to open a whole can of worms up.

Daniel Goldner (01:47:15):
Just so you know. It is possible. It's in your purview to change the limits.

Marc Brown (01:47:21):
You could put the genie back in the bottle if you wanted.

Daniel Goldner (01:47:25):
You mean re-regulate the

Marc Brown (01:47:27):
Market and

Daniel Goldner (01:47:29):
You could, there's serious

Marc Brown (01:47:30):
Discussions being had about it right now.

Sen. Howard Pearl (01:47:32):
But once you cross that five megawatt threshold, don't you get into issues with FERC and other things? Federal?

Daniel Goldner (01:47:41):
I'm sure there would be a host of issues to work, but ultimately anything is possible. That's what I would say. I mean,

Sen. Howard Pearl (01:47:50):
I know that five MW numbers seems to be a threshold or barrier when we're talking about net metering and things like that. Once we rub up against that, we sort of get out of the purview of the states.

Marc Brown (01:48:05):
That's a jurisdictional issue on compensation. But if you were to, what the chairman's talking about is a rate base issue, which generally falls to state approvals, I think.

Daniel Goldner (01:48:23):
Yeah, I'm not aware of any federal limit, Mr. She may want to comment, but it's so far, I'm not aware. I understand Senator Pearl, what you're talking about with respect to that metering, I'm just not sure from a

citing perspective there would be any jurisdictional boundary that I know of. Mr. Sheila, would you have any comment

Marc Brown (01:48:49):
Once you get outside of that?

Sen. Howard Pearl (01:48:55):
Okay,

Marc Brown (01:48:59):
David, sorry, just put your mic on. I'm sorry,

Daniel Goldner (01:49:01):
If you don't mind. I know it's a pain. Yeah, we get you
(01:49:06):
Once you get outside of the realm of net metering and in state compensation regimes that it's not, the five megawatt limit is not quite as important. Okay.

Marc Brown (01:49:25):
So let's say that they passed a law allowing for utilities to build up to 10 megawatts. Right? And let's say unit of above the 10 megawatt solar facility, that's not subject to further jurisdiction, right? Or is it

Rep. Keith Ammon (01:49:47):
Because it's rate based? I mean, I know,

Sen. Howard Pearl (01:49:51):
Right? I don't feel so bad now.

Rep. Keith Ammon (01:49:55):
No, it's complicated.

David Shulock (01:49:57):
I don't think it's a problem for the utility. Right? Right. It's the problem with net metering in that sort of compensation scheme has to do with whether it's a wholesale transaction that touches the grid.

Rep. Keith Ammon (01:50:19):
So it sounds like there's another suggestion here. I would need help putting it together. Is there a statute that we could reference that we could talk about modifying?

Daniel Goldner (01:50:31):
Yeah, perhaps Mr. Sheila and I could collaborate on something that would be unified.
(01:50:37):
Right. So it's the RSA 3 74 restructuring of the industry statute that essentially required utilities to divest of their assets. The nuclear assets went first, and they are otherwise prohibited from investing and owning

those assets unless they fall under this distributed generation exception where they can build up to five megawatts.

(01:51:09):

Exactly. So you could in theory call distributed generation 250 megawatts.

Rep. Keith Ammon (01:51:16):

So I mean, would you target it just for advanced nuclear or would you make it agnostic?

Daniel Goldner (01:51:21):

I would. I'm careful not to make recommendations rather than to say what's possible. And Mr.

David Shulock (01:51:27):

So of course the big issue with this is who's responsible for payment and it's rate payers. And the last time one of our utilities constructed a nuclear plant, it went bankrupt and rate payers were required to pay for those excess costs for years.

Rep. Keith Ammon (01:51:46):

But if we keep it small, like a micro react size, like up to 20 megawatts or something, then the risk is, risk is is

Daniel Goldner (01:51:54):

Lower. That's right. Just like the solar farms are five megawatts, the risk is pretty low. And that's what you're seeing now is the development of these smaller solar arrays that are utility owned. So you've kind of implemented that model on a smaller scale already.

Rep. Keith Ammon (01:52:10):

It could fall under the non wires alternatives too, right?

Daniel Goldner (01:52:13):

Yeah, that's true.

Rep. Keith Ammon (01:52:15):

So would you guys mind collaborating on that and pull me in as needed and we'll, is that all right? I mean, it sounds like something concrete that I'm grasping at concrete things here. Resolutions

David Shulock (01:52:28):

Are one thing. We'll talk afterwards and get you something. Okay.

Rep. Keith Ammon (01:52:32):

Alright.

Daniel Goldner (01:52:32):

Yeah, we can do that.

Rep. Keith Ammon (01:52:34):

Alright, so I'll put a 14 here. Alright, so we're almost done. It's been two hours. Would you mind indulging me in reading the conclusion? Another thing? I think

Marc Brown (01:52:49):

We, I'll be happy to indulge you. Yeah.

Rep. Keith Ammon (01:52:51):

And then we'll be done.

Marc Brown (01:52:53):

Alright, conclusion. In conclusion, New Hampshire may stand at a critical juncture in its energy policy, having the potential to become a net exporter of electricity to the rest of New England throughout strategic decision making. The foundation of this transformation may lie in adopting advanced nuclear energy technologies that promise to bring reliable and cost competitive electricity generation to commercial realization within the next decade. The analysis conducted by the Study Commission reveals significant process in nuclear energy, particularly in developing advanced reactor technologies. These new designs offer enhanced efficiency and safety, making nuclear power more viable and attractive for large scale energy production. By focusing on these innovative technologies, New Hampshire can establish itself as a leader in the advanced nuclear sector, excuse me, positionings itself as a major electricity supplier in the regional market. Central to this vision is the emphasis on cost competitiveness. Advanced nuclear reactors promised to improve operational efficiencies and reduce lifecycle costs, which could be a potential opportunity for New Hampshire to produce electricity at a lower cost than traditional fossil fuel based forces.

(01:53:58):

If this economic advantage is realized, it could allow our state to become a net electricity exporter, enabling the sale of clean and firm excess power and competitive prices to neighboring states. Moreover, focusing on advanced nuclear energy would align with broader energy reliability goals. Nuclear power plants can provide consistent and uninterrupted electricity, a critical factor in ensuring a stable and dependable energy supply for New Hampshire and the broader New England region, especially during the harsh winters we experience here. While the aspect of global warming is a significant consideration in the shift towards nuclear energy, the focus of this conclusion is predominantly on the economic and reliability benefits of this energy source. New Hampshire's adoption of advanced nuclear technologies would be a step towards a more sustainable energy future and a strategic economic move that can reshape the state's role in the regional energy landscape. With the foreign policy decisions, public and private focus and investment in advanced nuclear technology, New Hampshire could transform its energy sector into a leading provider of reliable and cost efficient electricity. Becoming a net energy exporter within New England. This move could benefit the state economically and contribute to more stable and diversified energy network in the region.

Rep. Keith Ammon (01:55:13):

So I said net energy exporter three times in there. I was trying to add on a positive note. So if you could give me your critiques on that and we can make some adjustments if needed. But just general thoughts on the conclusion.

Marc Brown (01:55:32):

I think maybe trimming one of the net energy exporter.

Rep. Keith Ammon (01:55:35):
Yeah, well take one of those out.

Marc Brown (01:55:36):
But no, I think it's good. I think it strikes the right tone.

Catherine Beahm (01:55:44):
Can you change global warming to climate

Rep. Keith Ammon (01:55:45):
Change? I could do that. Yep. So that paragraph there, is that okay with everyone? So climate change considerations are driving nuclear, I think, I don't want to speak on behalf of the entire state, but we focus more on reliability and economic issues. That seems to be our focus, but

Marc Brown (01:56:13):
We don't have any statutory requirements when it comes to carbon emissions or climate policies really. So I think that's accurate.

Rep. Keith Ammon (01:56:22):
That's okay. Alright.

Daniel Goldner (01:56:23):
The state's policy is all around cost effectiveness that the Department of Energy is published. So I think that the center of what the New Hampshire policy is today doesn't mean there aren't other things to consider, but that's the center of it

Rep. Keith Ammon (01:56:37):
And the reliability is super important for where we live, right?

Daniel Goldner (01:56:43):
That's right.

Rep. Keith Ammon (01:56:45):
Alright, any closing thoughts? Thanks everybody for coming today and helping with the quorum, but would you like to come up to the microphone?

Rep. Alvin See (01:57:00):
Thank you Mr. Chairman. Representative Alvin c Merrimack County District 26. And I just wanted to suggest that maybe you may want to add a glossary to the end to cover acronyms and stuff like that. Something like not everybody knows what Hulu is and there may be some technical terms relating to either nuclear energy or the normal electric power industry, maybe 20 to 50 terms or something like

Rep. Keith Ammon (01:57:35):
That. Would you mind working on that?

Rep. Alvin See (01:57:39):
I could.

Rep. Keith Ammon (01:57:40):
Okay.

Rep. Alvin See (01:57:41):
I would need to have a copy of the,

Rep. Keith Ammon (01:57:43):
I could send you report

Rep. Alvin See (01:57:44):
To hunt for the words that you've used.

Rep. Keith Ammon (01:57:46):
Okay.

Rep. Alvin See (01:57:48):
And the other thing might be useful early into the report would be a simple line graph that would compare energy levels, say from like megawatt, gigawatt, terawatt and what they're useful for. What will a megawatt typically power? How much power does the city of Concord use? How many megawatts

Rep. Keith Ammon (01:58:19):
There could be part of the glossary. Then you could have terawatt, I'm sorry to interrupt you. We could have megawatt terawatt and then in the definition kind of explain,

Rep. Alvin See (01:58:29):
Well I was thinking of a little line graph with little tick marks on there to point out, say the output power of the mow coal plant and several other things, how much power the city of Concord uses. Anything that people can relate to just as an idea of how much power is used. Okay. Nothing real complicated.

Marc Brown (01:58:57):
Can I make a suggestion? Sure. EIA has state level data. Maybe we just put a link in to the EIAs, one of your acronyms, the US doe and that links right to New Hampshire, gives a whole bunch of state specific profiles that may be helpful to

Rep. Keith Ammon (01:59:15):
The reader. Could you send me that? Yeah, I'll send you

Marc Brown (01:59:16):
The link

Rep. Keith Ammon (01:59:17):

And we could put it in somewhere. So Alvin, I appreciate your suggestions. You make the same a hundred dollars a year that I do. So any help that you can give would be appreciated. Okay,

Rep. Alvin See (01:59:30):
Thank you.

Sen. Howard Pearl (01:59:31):
Just get a hundred dollars a year. Yeah.

Rep. Keith Ammon (01:59:35):
Alright.

Marc Brown (01:59:35):
Do we need to vote on this or anything or,

Rep. Keith Ammon (01:59:37):
So that would be my next question. We could have a signature page if everybody wants to sign it. And I thought maybe having served on other commissions, if you're in a department position that you may be reluctant to do that. So that would be one option is we all sign a piece of paper and we

Sen. Howard Pearl (02:00:01):
Scan it. And my suggestion would we just have the chairman put the report in for the commission

Rep. Keith Ammon (02:00:07):
So we could vote on the report with some caveats. Right. So

Sen. Howard Pearl (02:00:11):
When do we have to have this in?

Rep. Keith Ammon (02:00:13):
It's due in statute. It's due today, which is why we have the meeting today. But I think we could probably stretch that in a couple of days to get it right And I think getting it right's the most important thing.

Marc Brown (02:00:28):
Can I make a motion to approve with suggested amendments?

Rep. Keith Ammon (02:00:33):
Yeah. Is that okay? Second. And then

Sen. Howard Pearl (02:00:36):
That's what I was going to do

Rep. Keith Ammon (02:00:37):

This weekend. I will make all those changes. We would need a glossary by then. I can send you this document after and then we will talk after the meeting on that. And then I'll track changes. I'll distribute over the weekend. I'll distribute exactly what was changed. So you can quickly scan it, like

Sen. Howard Pearl (02:01:00):

A red line version,

Rep. Keith Ammon (02:01:00):

Red line version, and then we'll release that final product. So would people be willing to check their email on Saturday and Sunday and just reply? Is that alright with you? No problem. And then we'll get this released by Monday. Does that work for you, Alvin? Okay. Any objections to that approach? Alright. Do you want to make a motion?

Sen. Howard Pearl (02:01:30):

He did and I

Rep. Keith Ammon (02:01:30):

Second it. Oh, you did already. Okay.

Sen. Howard Pearl (02:01:32):

I seconded it. So it's ready for you.

Rep. Keith Ammon (02:01:35):

Any discussion on the motion? All in favor say aye. Aye. Aye. Any opposed? None opposed. Alright, that wraps it up. Three o'clock on the dot. Thanks everybody. This was an interesting exercise.

Marc Brown (02:01:50):

Thank you for putting in as much work as you did because you carried 98.99 probably percent of the load here. So

Rep. Keith Ammon (02:01:58):

That's base load. He carried the base load. The base load we have to have and the website will stay up. I'll keep it up for a couple of years. All of the documents. So it's nuclear, NH energy. All the meetings are listed there. I had to figure out how to do this. The official state link, you have to request permission if you want to post more than one document. So I did get that permission. And in the next couple of weeks I'm going to migrate all of the meeting minutes and so forth over to the state site so it's permanent. So it'll be in two places. So we'll have a record of all our work for posterity, hopefully. Alright, motion to adjourn. So moved second by mark. Alright, all in favor to adjourn. Aye. Aye. Any opposed? Beye adjourned.