HANSARD

NOVA SCOTIA HOUSE OF ASSEMBLY

COMMITTEE ON
NATURAL RESOURCES AND
ECONOMIC DEVELOPMENT

Tuesday, March 22, 2022

Committees Room

Renewable Energy: Progress Towards Targets

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ECONOMIC DEVELOPMENT COMMITTEE

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In Attendance:

Judy Kavanagh
Acting Legislative Committee Clerk

Karen Kinley
Legislative Counsel

WITNESSES

Department of Natural Resources and Renewables

Karen Gatien,
Deputy Minister

Keith Collins,
Executive Director - Clean Energy

David Miller,
Director - Clean Electricity

HALIFAX, TUESDAY, MARCH 22, 2022

STANDING COMMITTEE ON
NATURAL RESOURCES AND ECONOMIC DEVELOPMENT

1:00 P.M.

CHAIR
Tom Taggart

VICE-CHAIR
Dave Ritcey

THE CHAIR: Order. I call this meeting to order. Thank you everyone for joining us today. This is the Standing Committee on Natural Resources and Economic Development for March 22, 2022. I'm Dave Ritcey, I'm the MLA for Truro-Bible Hill-Millbrook-Salmon River, and the Vice-Chair of this committee. I'll be chairing for MLA Tom Taggart.

Today we have officials joining us from the Department of Natural Resources and Renewables. A reminder to please turn off your phones or put them on silent. Also, following Province House protocols, please keep your masks on unless you are speaking.

I will now ask the committee members to introduce themselves for the record by stating your name and constituency.

[The committee members introduced themselves.]

THE CHAIR: I'd also like to recognize the presence of Legislative Counsel Karen Kinley and Legislative Committee Clerk Judy Kavanagh, who is sitting in for acting clerk Sherri Mitchell.

I'd like to welcome our witnesses and ask them to introduce themselves. I'll start with Ms. Gatien.

[The witnesses introduced themselves.]

THE CHAIR: Witnesses, would you have opening remarks at this time? We'll start with Deputy Minister Gatien.

KAREN GATIEN: Thank you for having us here today. Certainly we know that climate change is one of the world's most pressing issues, and our department is committed to having 80 per cent of Nova Scotia's electricity needs being supplied by renewable energy by 2030. This will take ongoing collaboration with our partners, and we're continuing to work together to meet this important goal.

Just a decade ago, in fact, 80 per cent of our electricity came from coal and heavy carbon fuels, and by the end of the calendar year, this will have fallen to about 30 per cent. Over the next two years, we are investing nearly $120 million in programs that reduce emissions and fight climate change. We continue to work with our partners across the Atlantic region on a path to get off coal-generated power, and this is a key step as we work to achieve our 2030 goal.

We're working with our utility, stakeholders, and others to identify additional options that protect ratepayers and ensure a safe, stable supply of energy to our province. Meeting our 80 per cent 2030 goal will require a suite of solutions all moving us along that path. In February, we launched a request for proposals to attract low-cost and innovative solutions to supply 10 per cent of Nova Scotia's electricity from wind and solar. The latest information we have is that the RFP has drawn about 25 bidders, and our procurement administrator, CustomerFirst Renewables, will be going through all of the bids and making a decision on the successful bidders in the coming weeks and months.

Once these projects are up and running, they will reduce Nova Scotia's greenhouse gas emissions by more than one million tonnes each year as the RFP seeks 350 megawatts of electricity from renewables. This work supports the Province's goal of achieving a 53-per-cent reduction in greenhouse gas emissions by 2030 and becoming net zero by 2050. By far, this represents the largest potential from a single government action to reduce greenhouse gases.

In addition to these projects coming out of the RFP, we're also working on new residential and community solar programs, which we hope to launch later this year. These new programs will make solar an option for many more Nova Scotians. Other things we're doing to fight climate change include advancing the electrification of transportation, and it's a key component of reducing our greenhouse gas emissions. We're working with the federal government to advance EV adoption through incentives, education, and building charging infrastructure across Nova Scotia. We've recently committed funding to have

more community EV chargers installed across the province. That will give people reliable options so that they can use their electric vehicles anywhere they go in Nova Scotia.

Tidal development is another emerging sector that will result in green technologies, green jobs, a cleaner environment, and a predictable renewable source of electricity. Many of you may already be aware as well of the Maritime Link project, which uses a 500-megawatt, high-voltage, direct current connection that enables clean renewable electricity generated in Newfoundland and Labrador to be transmitted to the North American grid in Nova Scotia.

The stabilizing features of this solution will also allow Nova Scotia to integrate additional renewables to the mix, and once stable, reliable amounts of energy are generated by the Maritime Link. It will contribute significantly to our goal of generating 80 per cent of our energy from renewables.

You may also have heard as well about the Atlantic Loop, which is another option to get us to our target. The Atlantic Loop is a transmission line project that would connect Quebec to Nova Scotia and would allow the surplus clean power to flow to regions transitioning away from coal. It is a focus of discussion in the federal Clean Power Roadmap for Atlantic Canada.

The broad concept is to upgrade transmission capacity on the East Coast to allow hydroelectric power from Labrador and Quebec to displace coal use in the region. Of course, we need federal support to make the Atlantic Loop a reality, but we will continue to explore all of our options to meet our 80 per cent renewable target.

Finally, in terms of coal to clean, as I mentioned earlier, it was just a decade ago that we were using 80 per cent coal for our electricity, and heavy carbon fuels as well, and now we're soon, as I already stated, going to be at 30 per cent with 70 per cent renewables. Over the next two years, we're going to push a little further and we're going to invest nearly $120 million in programs that will help reduce emissions and fight climate change.

We'll continue to work with our partners across the Atlantic region on a path to get off coal-generated power, and this is a key step as we work to achieve our 2030 goal. We're working again with our utility, stakeholders, and others to identify the additional options that protect ratepayers and ensure a safe, stable supply of energy to our province.

We know there's a lot to do in order for us to meet our climate change goals. We remain steadfast in our commitment to advancing our clean energy future, and we look forward to answering your questions following our presentation. I thank you for your time, and I'm going to turn it over to Keith, who will walk you through the slides.

THE CHAIR: Mr. Collins.

KEITH COLLINS: Renewable electricity standards - tools used around the world - sometimes go by the term RPS, for renewable portfolio standards. The idea being each jurisdiction would bring on a subset of renewable energy forms that were best suited to their location. Some were windy, some were sunny, some were lots of biomass, et cetera. It was often called portfolio standard.

The first thing is that it has to be renewable energy - that's usually the target of these tools. The second thing you should note is the doubling time. Almost any energy form, any new energy technology for people worried about the technology and how fast it's coming along, you look at doubling time. They all started at nothing, whether it was electric vehicles and batteries or solar panels or wind. There were no such things 30 years ago, just zero per cent penetration. Then it would begin to take off. As the usage went up, as it doubled, say, from 5 per cent to 10 per cent, you can actually measure how much the price drops, and that will tell you how much it's going to drop in the next doubling and the next one.

You can literally look at curves from 30 years ago on solar, and you can pretty much run to the dime today where solar is. It's an amazing set of curves, but it's all off doubling time. Look at Nova Scotia, that's a good, solid - we went five to 10, 10 to 20, 20 to 40, 40 to 80.

That's the curve. We're right now at 30 per cent-ish, which is the mid-zone, when you get big gulps of energy you can bring on quite easily but your end game is difficult. Getting from 80 to 100, you're squeezing a bit of this or a bit of that. It's hard to project out into that zone, but we're in the mid-zone now. Basically, Nova Scotia has tonnes of wind. It's cheap. It has lots of potential sites that it can go on. Some are near communities that may not be in love with it. They don't have to have it. There are lots of places it can go, and it will work and it will be cheap.

It's not like years ago. I remember wind was 10 to 15 cents a kilowatt hour. It's four, five, six now. It's the cheapest thing. It's as cheap as dirt. It's cheaper than coal. For Nova Scotia, we're at 30 per cent-ish right now and really it's a question of when Muskrat Falls and the Labrador Island line - those two components - kick in. There's up to 30 per cent of clean, renewable energy that will come through that link. Nova Scotians are paying for the link, the energy will come through as Newfoundland works through the testing and commissioning of its components, and that will push us up toward 60. We will count the Nova Scotia block in there and then we'll be looking to add wind. Next slide.

You can see here, as it lifts off, the renewables have been growing, growing, and obviously the piece that would have pushed further in 2018, 2019, 2020 would be the link would push that up, so it's delayed, but it will be moving us up across 50 and 60.

Next slide, there's your yearly production again. Purchase power, biomass, wind, and hydro. Wind and hydro are coming on rapidly. There is a series of renewables that you

can count in, including tidal, wind, solar exported into the grid - we count it. Governments have used different tools along the way. Basically, you try to design - if you're doing your first per cent of something, you're going to try to use a certain kind of tool, you're probably going to have to incent it or subsidize it. If you're out in the 40, 50, 60 per cent of the way up the curve, you're going to use different sets of tools.

That's really a difference. I don't think there are massive political differences between the use of some of these tools. As a result, you will see a portfolio effect show up today. Portions are owned by Nova Scotia Power, portions are owned by independent energy companies, portions are owned by communities. Next to you, David, I believe.

THE CHAIR: Mr. Miller.

DAVID MILLER: Right now, we're in the period of compliance for the 2020 Renewable Electricity Standard, and that is set at 40 per cent. To meet that, Nova Scotia Power was required to acquire 20 per cent of the output of Muskrat Falls. As the committee may be aware, there are some challenges that remain with the delivery of electricity, particularly over the Labrador Island link, so that Renewable Electricity Standard was not met in 2020, and it was not met in 2021.

There was a three-year alternative compliance period that was provided to Nova Scotia Power to supply that 40 per cent renewable electricity over the three-year period of 2020 to 2022. It's still unclear whether they will entirely achieve that. There are still some challenges associated with the Maritime Link, but it's certainly hoped that they will be able to obtain the full Nova Scotia block as well as some additional deliveries of energy that have been delayed. They're still targeting to be on track to hit that 40 per cent compliance over those three years.

The 2030 Renewable Electricity Standard, which is some of the work that we've alluded to in our opening statements and the work that the department is focused on now, is to double that number from 40 per cent to 80 per cent. The regulation requires that an additional 10 per cent of renewables are acquired from independent power producers, and that's the RFP that's open now, that CustomerFirst Renewables is administering on behalf of the Province. They are an independent decision-maker. The department has no decision-making authority for the results of that process.

Getting to 80 per cent also anticipates the increased use of Maritime Link or full use of the Maritime Link and other imports, as well as all of the assets that are already in place. As Keith mentioned, the Maritime Link could deliver as much as 30 per cent of Nova Scotia's electricity needs in a year. With the existing renewables of about 30 per cent, plus the 10 per cent that we're acquiring from new wind, we would be at about 70 per cent renewables as early as 2025.

[1:15 p.m.]

Additional programming will then be required to move us from that 70-plus to the 80 per cent, but over the subsequent five years, and even leading up to 2025, our additional programming for solar will add a few per cent. A potential additional wind procurement for upcoming programs like Green Choice or for all customers will also help us to get closer to 80 per cent.

I mentioned some of these already around the programming. As we said, the RFP is for over a terawatt of energy. It's about 10 per cent of the total system - 1,100 gigawatt hours. The Green Choice program is a program to enable larger customers to obtain 100 per cent renewable electricity for their operations through the construction of new renewable energy assets.

As we've seen, lots of customers around the world are seeking 100 per cent renewable energy as part of their corporate commitments. If we don't have a way for them to get to 100 per cent here, they may not be able to expand or invest in Nova Scotia. We want to create that pathway.

In addition to corporate clients, we certainly have a lot of institutional interest in this program. It was partly launched or designed to enable the federal government to obtain 100 per cent renewable electricity for their operations here in Nova Scotia, which is a fairly sizable load because we have a lot of federal facilities here. When we started to talk to customers, we got more interest than we anticipated, and we got some great feedback on the program design. We're continuing to work through that to make sure it delivers what customers need for their own corporate commitments and what they anticipate in terms of costs.

The shared or community solar program is one that's currently in development now. This is intended to enable all Nova Scotians to have access to solar. Right now, it's a little bit harder to get solar if you don't own your own home and have a roof that's facing in the right direction that doesn't need work in the next few years. There can be a lot of barriers. The upfront capital cost is just one of those barriers.

Community solar or shared solar programs exist in a lot of jurisdictions and they have a much lower barrier to entry. In some cases, it's just a monthly subscription, so you can sign up for so many dollars per month and help offset your energy use. You don't have to do any work on your own home. You don't have to manage contractors. All you do is subscribe. It's kind of like Netflix for solar, as some have described it.

It's a very popular program and it generally results in locally developed solar close to you or inside your community, and it often employs local people as well. We see opportunities to ensure that low-income individuals and organizations and even small

businesses can easily access this. We're working to make sure that equity is a key component of the program design.

Commercial solar is an area we're looking to expand. This would be through a net metering-style program. This is also under development. We've had some early engagement with industry. We've heard a lot from the industry and from potential customers about what they would like to see as larger solar installations.

Some of you may be familiar with IKEA's solar installation, which is quite large. I think it's about 850 kilowatts. They had to do a lot of design work to make that fit under the existing program rules. We just want to make sure that that scale of project is something that others can achieve without some of the complexities that IKEA had to break new ground to get.

We're seeing growth as well in the tidal sector. It has been slow to get started, but as you can imagine, it's a very complex area to work in. Right now, we have a number of projects that could start generating electricity for the grid this year. There have been some test processes under way in the Digby area and we see those materializing and potential generation of electricity for the Nova Scotia grid in the near term.

Future procurements: Depending on the results of this procurement process we have under way, and as the industry for renewable energy development develops further - both wind and solar or other technologies - we can get a better sense of what is the most cost-effective and economical benefit to Nova Scotia to deliver our next set of procurements.

That's the presentation. Thank you.

THE CHAIR: Thank you, Mr. Miller and Mr. Collins, for your opening remarks, and all witnesses, as well as Deputy Minister Gatien.

I just want to remind everyone to wait for their name to be called and their microphone red light to be turned on before speaking. We're going to begin our Q&A period. If you wish to ask a question, please indicate by raising your hand. MLA Chender.

CLAUDIA CHENDER: Thank you. I'll start by saying that I'm really looking forward to Estimates, because I know we won't be able to ask all of our questions here. But we'll ask a few. That was really helpful.

I guess to start, there's a lot of conversation about the Atlantic Loop, which I noticed wasn't actually mentioned extensively in your presentation but which seems to be required to get us at least to the 2050 goal of net zero. We've been told that there's a Plan B and a Plan C if the Atlantic Loop doesn't come through. We haven't been given any details about those Plan Bs and Plan Cs, so lots of questions about that.

One contingency plan that was raised by Scott Balfour at Emera was more natural gas as a bridge. Now, this flies directly in the face of the advice from the International Energy Agency, and I think increasingly of global consensus that we cannot take any more fossil fuels out of the ground if we hope to avert the worst of the environmental crisis.

I just want to ask if there's a commitment to follow that recommendation and cease fossil fuel exploration entirely, or if natural gas is still on the table. Is it part of our energy mix? I'll put it to the deputy minister, but whoever wants to take it up.

KAREN GATIEN: Thank you for your question. I would say that at this point, we're looking at all of our options, particularly to get to 2030. I know there's that other 20 per cent. We've not been given direction to put it on or off, but we're making every effort to be truly net zero by 2050 and looking at all renewable options. That's why there are programs like tidal. We're looking into what's possible for tidal.

Are there other kinds of biofuels? That might be possible. Are there other types of renewable sources of energy that perhaps aren't ready to go to market at this point that we could perhaps explore as well? We do recognize the concerns around natural gas.

I think Keith wants to add something.

KEITH COLLINS: On the Loop and Plan B and so on, and its necessity, et cetera, Nova Scotia Power and the NSUARB and all its stakeholders went through a very large-scale planning process: the Integrated Resource Plan. It found that there are multiple paths and multiple pieces we can put on the table at different times.

Obviously, if we had clean power from Quebec, firm power at the right price, reliable - if it meets all those characteristics, that moves into play and becomes a subject of discussion, but there are other pieces as well. These could be everything from tidal, hydrogen, if you look out 10 and 20 years to more wind batteries are closer in time.

I'll say this on natural gas: the federal government has a new proposal out on clean electricity standards, and they're reviewing the options around natural gas. Obviously there are concerns because it's a fossil fuel and it releases emissions and there are fugitive emissions and the whole chain has to be weighed.

The question the federal government seems to be asking right now is, what do we do in emergency situations - Wintertime coldest days backup? Do we have sufficient capacity that is not coal and not gas right now, or do we have to bridge in those usages, and how would we contain that?

They've asked these questions in a consultation paper that's out there right now. I don't have the answers to that consultation paper, but I do know that's the subject of discussion, where there's concern about how much gas you might use in this particular end

use. But there's also weighing out what the value of that fuel may be over a certain period in time.

THE CHAIR: MLA Kerr.

CARMAN KERR: Thanks to the three of you for coming today. I'm holding the final report on the Clean Power Roadmap for Atlantic Canada, and there is a mention on Page 6, I believe, of SMRs - small modular reactors - as being an opportunity for firm, reliable energy.

To Deputy Minister Gatien: as DNRR is listed as a committee member and part of these discussions, could you expand on what's been said or what's been talked about with nuclear energy?

KAREN GATIEN: In terms of what Nova Scotia would have, nothing extensive in the province. Certainly there'd be the opportunity if there was firm capacity in New Brunswick, and if the inner tie was built between Nova Scotia and New Brunswick. To Keith's point earlier, if there was a requirement for some firm capacity when the wind doesn't blow in January, there would be the possibility to access that, but there've been no decisions made.

To be perfectly frank, I've not been part of any discussions on the use of them. I know New Brunswick's very supportive of them.

DAVID MILLER: I sat on a number of the meetings for the Clean Power Roadmap, and certainly SMRs have been a key priority for New Brunswick, but not just New Brunswick. There are other jurisdictions such as Ontario in particular, looking at SMRs as the next stage of nuclear development. As we've seen, nuclear development is kind of a cluster industry where you need the supports to grow that. Starting from the ground up is more challenging in that development phase. That's why we see existing nuclear jurisdictions trying to accelerate and build on that process. First of all, it's an industry they already have. They have the technical skills and the procurement and all of those pieces.

We're certainly interested in how SMRs develop and we're watching that commercialization pathway for the technologies proposed in New Brunswick, but also in Ontario, which has a very aggressive timeline. I think they're projecting one before 2030 to be in service. We'll be watching that as we are considering all options for what the next stage is to get off fossil fuels. At this time, we don't have the structure in Nova Scotia to support the development of a nuclear sector in the same way that these other jurisdictions do.

THE CHAIR: MLA Boudreau.

TREVOR BOUDREAU: You talked a bit about the RFP for the 350 megawatts of electricity with wind and solar. What kind of projects are you expecting with this type of RFP? Do you have any details or any ideas of what you'd like to see with those wind and solar projects?

KAREN GATIEN: I'll ask David Miller to respond. He's been most closely linked with the procurement.

DAVID MILLER: We anticipate that the RFP process will probably result in about five projects selected. It's unclear about the geographic distribution. There are a lot of factors that go into siting of wind projects - both their proximity to transmission lines, their proximity to the load centre here in Halifax, and obviously the wind regime.

We don't know exactly where they'll be. We've heard a lot about proposals from almost entirely across the province. There are some areas that are more challenging to develop because of the constraints in the electricity system, such as Digby, which has a lot of challenges to try and get electricity out from that area, among other challenges.

I think that we expect several larger-scale wind projects to probably be the most competitive. We set a very aggressive price point of a maximum of $58 per megawatt hour, and that's going to require a very good solar project to reach that price point at present. It will even require a lot of work from our wind developers as a result of inflation in steel and other inputs to the sector.

We expect probably five projects or so in the larger scale - 80-to-100-megawatt range - which is the maximum size. No project is allowed to bid at a greater than 100-megawatt size.

THE CHAIR: MLA Palmer.

CHRIS PALMER: Just following up on my friend's question about the RFP. My question would be directed to Mr. Miller. You had mentioned in your presentation some of the potential business opportunities and economic spinoffs from the RFP and how it will help the green economy. Can you clarify or speak to that a bit more and tell us about the economic benefits and how it will be a benefit for jobs and local small businesses for areas like the Annapolis Valley where I represent?

DAVID MILLER: Certainly. If we base this on what we anticipate the likely outcome to be, which is predominantly a wind success story for the RFP process, we see that resulting in about 400 to 700 jobs during the construction of those projects. The construction is usually about a 24-month cycle, so it's not a long time. These projects are capital intensive, and the construction process is fairly compressed.

That said, people look at a wind project and what they see is a big steel tower and the blades. A lot of that is imported. What you don't see is all of the groundwork that gets done ahead of time. There is an extensive amount of site preparation, and even going before that, there's a lot of work associated with the environmental assessment, preparing the land, doing the surveys, all of those pieces. Just the pouring of concrete - that's a local job. The rebar, all that supply work, are local jobs, and then there's a lot of crane operations and other construction work that's involved.

[1:30 p.m.]

Depending on how the industry is responding at the time, these projects can be about $1.5 million to $2 million per megawatt, so this is in the range of $500 million to $700 million of investment. A lot of that, as I said, will go for the turbine and tower supply, but we still see a lot of local benefits. These will all be rural opportunities. There won't be any wind projects constructed in Dartmouth or Halifax, obviously. Hopefully we'll see some of those benefits spread across the province, but that's a decision for the procurement administrator based on the technical criteria.

We see substantial opportunities in the near term. From what we know from our Community Feed-in Tariff program and from local proponents, there are local people ready to do all this work. There are local people who are trained now and more will need to be trained to maintain these turbines over the duration of their life, which is at least 25 years.

KEITH COLLINS: Just to throw in a couple more points, we're saying that after the construction is done, there are additional benefits. Let's say right now, you're burning coal and buying coal in. Afterward, you're going to have wind. You're not buying coal and the dollars are staying here. Also, the price is stable - 25 years. Everybody can count on it, as opposed to what we're seeing right now, where the global price of coal went from $50 a ton to over $400 a week or so ago.

It's an enormously strong force for keeping down inflation, keeping down that kind of variability in the economy, so you're saving on fuels. Also, to the degree that people get equity in the project - local people, local groups, First Nations - they then make earnings back into the local economy instead of it going offshore.

THE CHAIR: MLA Lachance.

LISA LACHANCE: Actually, that question and some of your answers lead very well into the question I wanted to talk about, which was around green jobs transition. We've talked about that previously at this committee and it's certainly an issue that our caucus has been very concerned about for years in terms of how to support that transition.

I'm wondering if you can provide other detail in terms of how the department is involved in workforce planning transition. I think there's a net zero workforce adaptation

committee. I'm wondering if you're involved with that and who else is, have you been meeting, and what the mandate is. Are we having follow-ups?

THE CHAIR: No.

LISA LACHANCE: Okay.

THE CHAIR: Your question is directed to - okay, Deputy Minister Gatien.

KAREN GATIEN: I'll start at a high level and then I know Keith has something he wants to add. We work very closely with our colleagues at the Department of Labour, Skills and Immigration. In terms of the just-transition work, in terms of green jobs - also at the Department of Advanced Education - I think what we're doing now is, okay, what are the jobs? What does that look like? There'll be some that will evolve over time, as the green tech sector evolves over time, but we will work closely with our colleagues across government to try to plan and develop a pipeline as well as retraining options for people.

In terms of transitions, I know you had Nova Scotia Power here talking about their employees at the coal plants when they close, so how do we retrain them to be able to fully participate in the new economy and the new jobs?

That's our focus. A lot of our department focus is more on what communities and sectors might need, but that, coupled with the work of our colleagues who are more connected to the workplace and workforce transition will round out the work that needs to be done in order to allow people to fully transition. It is an important point and does need a lot of attention. I agree.

I know Keith had something to add there.

KEITH COLLINS: I have to say something, because I've worked on this one for 32 years. I moved from the Valley up to Ontario and worked in the first green industry office - we set up a thing called Green Communities. Green industries has been green jobs for 30-some years. It's great to see the curve and the growth, to start with.

In Nova Scotia, I'll just go through a few areas where the work has been concentrated. Solar has obviously been a big one. We used to have 20 to 40 units installed a year. It's now 1,500 to 2,000 a year. That's in three or four years. There's an enormous labour component - local labour, local jobs that have been spread all over the province. There are 70-something companies registered in the trade network, and probably 400-plus jobs. We think there is headroom for more growth in that area, but you get local labour installing, but also the marketing, contracting, storage - all those things.

The price of the panels is almost nothing now. There is far more that's in the labour and the local handling than in the hardware you're bringing in, the solar panels. Also, once they're in, the dollars and the savings are staying in-province again and not shooting out.

Heat pumps are pretty similar. Nova Scotia has been the hotbed for heat pumps pretty much on the continent, almost - about 30,000 a year. So that's a $150 million a year, market - heat pumps now in Nova Scotia. Again, a huge amount is labour content. It's spread all through every rural riding, every neighbourhood. Again, you're replacing heating oil, which is imported, so about 85 cents on a dollar would be going out of province that's staying here and going to the heat pump and electricity. Heat pumps have been another distributed energy source, a very large success - a lot of jobs.

EVs hopefully will be our next one - electric vehicles and active transport. People forget active transport, but if you're out of your car and you're walking, you're not paying for gas and all the things that go with it. It's just renewable transport - you can call it that. Electric vehicles, you're shifting your fuel source over from an imported gasoline, and you're saving x-thousands of dollars a year on your fuel for your vehicles. All that translates over into more dollars in the local economy, and more jobs come about.

Energy efficiency has been a massive success story. Again, it's 2,500 to 3,500 jobs, depending on how many categories you include. It goes on provincewide. It's a real way for people to knock their energy usage down. We discussed wind.

Batteries will probably be one you'll see take off. We're in the very early stages of the scale in Nova Scotia. There's a series of pieces that have to come into place, but we have the battery wizards in Jeff Dahn and company down the road who do fabulous leading-edge work, but we would expect to see batteries come into the larger grid, as well as home and community use. Again, another whole area of the jobs open up. Each one of those, as they come on, you've got all the issues of training and quality control, et cetera.

Doing that through COVID-19 has been hell unlimited for everybody involved. God bless them out there at NSCC and everywhere else where they're running these courses and they're doing things virtually, et cetera, which is pretty - it's a trick. I think they've done a great job getting us here, but we absolutely have some choke points in the labour market. Not enough people, or not being paid at the right rate, or not trained at the right rate - all that stuff has to be unkinked. I'm thrilled that that's not my day-to-day job because that's a hard one. That's when I just shout for help. That's the work from our end going into green jobs.

THE CHAIR: MLA Smith.

KENT SMITH: Just a comment to start. Mr. Miller, I heard you say that you don't expect to see wind turbines in Dartmouth or in Halifax. I just wanted to say that Halifax

goes all the way to Ecum Secum. (Laughter) Some of my constituents along the Eastern Shore would be happy to have some wind energy in their backyard.

I'll change things up a little bit and go back to Muskrat Falls. We talked a little bit about it during your opening remarks. I'm just curious if we can get a little more explanation, a little more detail on when it's operational, how much can we expect for that to impact our grid, and how much of an impact toward our goals.

KEITH COLLINS: I worked 10 or 15 years out west in Manitoba on the big hydro projects and transmission projects coming out of that province through Manitoba Hydro. They used to be very insistent on one point, which is that the large dam projects that are then connected to the long DC lines - they said, look, this is not a science, this is an art.

It's a real trick to get them together and get them working from day to day. Newfoundland has to come from getting the dam working and increasingly the generators are generating at Muskrat Falls. That's becoming a problem that is being resolved and managed and put back in the box. That's working. They've then got to bring the power down across Labrador, under the Strait, over the Island, the Island has to figure out what they're doing in terms of the Holyrood plant. Then it has to come back across the Island and go under again through the Maritime Link.

The Maritime Link is working fine and the dam's working increasingly well. They bring them on one unit at a time and they begin to export more as they come on over a period of a couple of years. The Link is having difficulties, and this is increasingly published now, so they're working through the software problems that everybody's heard about, but they have testing and commissioning issues. I believe there was one published the other day, they threw a switch out of sequence and it's out for days at an enormous cost to the province, et cetera, but it is a real trick to get it up and working on a sustained basis.

We're hoping right now that this Spring we will see a greater frequency of days in which the Nova Scotia block comes through, which is the one we're being guaranteed, and then the market access block, which is made up of three units. One is the Nova Scotia block that we're guaranteed; we get that. The other two are market access - we get to buy it in if we want.

I think a lot of these days we'd probably be wanting to buy in, but we need the LIL, the Labrador Island Link, to be working fully. I believe they're still working through the testing and commissioning. That's going to be going on through the Spring and Summer. The UARB just held a hearing on it, and I think that was their conclusion as well, that they were going to check back in in August on the market access blocks.

It's in their hands. It's a bit of magic and mystery. It is not at all how anybody wanted it to unfold. I was just reading Newfoundland and Labrador press clippings yesterday and they are distinctly unhappy with the delays. They are as they are, and there's

not all that much Nova Scotia can do to prod it or make it happen. I think I'll leave it there. David?

DAVID MILLER: Just to add to some of the operational impacts that it will have when it's operating, it's important to note that this is a permanent piece of infrastructure, so once it is working and all of the components are functioning as designed, we'll have access to - as Keith has noted - a really substantial amount of clean electricity from Newfoundland and Labrador on an annual basis.

If it was working as anticipated, we would get more than 10 per cent of our electricity through our existing contract. Between the Nova Scotia block and what's called the supplemental block, it's about 1.2 terawatt hours per year, so just over 10 per cent, probably close to 11 per cent of total electricity needs here in the province.

As Keith mentioned, we then have a right of first refusal on the rest of the energy that can flow through that transmission line. When Newfoundland has more electricity than they need once this is fully operational and they want to export that, we can be the first buyer. It has to pass through us to get to New Brunswick or to New England, which is really the target market for a lot of electricity sales. We can buy it at a lower cost because you lose electricity as you move it along.

There are transmission losses, so every time you go from one province to the next, there's a new set of tolls and fees and there's a new set of losses. We have the opportunity to buy that market energy at a lower rate than New England would pay. We can gain access to a lot of low-cost renewable electricity for a lot of the year.

The current expectation is that could be as much as another 1.8 to 2 terawatt hours, so almost another 20 per cent of our electricity needs. In total, fully operational, 30 per cent of our electricity could come from Newfoundland and Labrador over the Maritime Link. It would deliver winter capacity as well, that's part of the agreement. We think of energy as a flow, and the instantaneous point of that is the capacity, and that's when you turn your toaster on or flick your coffee maker on, you need electricity then. Winter is when we have our peak, of course, when it's coldest and people are throwing on their electric heat and boiling kettles, et cetera.

The Maritime Link delivers capacity. It has the potential to deliver up to 500 megawatts of capacity, which is the equivalent of three coal units. There is an opportunity that this will not just give us clean electricity, but it will enable us to shut down some coal units. Once it's fully operational, as Keith has mentioned, and consistently delivering, it's anticipated that Nova Scotia Power will close Lingan 2, one of the four Lingan coal units will be shut down permanently as a result.

This will be a replacement for one, but the remaining capacity on that line could help us to reduce our use very significantly of the other coal units and potentially, if we

can firm that up or bring in other sources, we could help to use that integration of new wind and new solar to shut down more coal.

THE CHAIR: Thank you, Mr. Miller. We'll start with round two here, starting with MLA Chender, and then MLA LeBlanc.

CLAUDIA CHENDER: I want to ask about biomass, which I feel like I ask you guys about every time I see you at committee. This question I want to ask is a little different.

[1:45 p.m.]

I think it's agreed that we need a system that ensures the sustainability of procurement for biomass, and we've talked about that. We'll leave aside, for the moment, whether biomass is actually renewable or not, but we don't have that system. That became really clear recently when Dalhousie sourced a billion dollar plus contract of sustainable biomass from J.D. Irving and Wagner Forest Management, and they didn't source it from these community forestry co-ops that they had previously.

I think it hits on a lot of the points that Mr. Collins in particular has been making. If it's coming from local product, if it's in our economic system, there's so much advantage to that if we're sourcing our energy that way.

I'm wondering if the department has a stance based on those comments and the situation that just happened about whether biomass supplied by industrial forestry is as sustainable as biomass supply by local forestry co-ops, and is there a way that that would translate into procurement?

KAREN GATIEN: What I can say is that the expectation for the department is that when we talk biomass, we're talking about residuals, right? Very clearly. I know perhaps others don't think of it that way, but that's what we're talking about. Our expectation is as we move further and further along sustainable forestry practices, that all of the residuals would be produced from those sustainable forestry practices, and so that would be support.

In terms of a stance, I don't know that we've come up with a formal position, but I'll certainly take that back for consideration. In terms of procurement, we've not had that conversation with procurement - this was a university that did their own procurement. I know you know that the biomass used at Brooklyn Power - our expectation is that that would be drawn from Nova Scotia producers of those residuals to be used at Brooklyn Power because we have a relationship there. Does that mean that they couldn't access it from private landowners who produce it in another way? At this point, yes they could.

THE CHAIR: MLA LeBlanc.

RONNIE LEBLANC: My question is for Mr. Miller. You reference the power grid in Digby County, but, essentially, the grid from Annapolis to Yarmouth is one of the smallest grids, if not the smallest grid, in Canada, at least. The question I have is with the grid at full capacity. How is that area of the province supposed to participate in the green economy and have those green projects? If you're a small producer or a municipality that's looking to participate, the grid won't allow it.

Even from my understanding with tidal in Digby Neck, in order for that to be viable, they need energy storage there which makes it much more costly. The question I have is how are you trying to plan so that that area of the province can participate fully with a grid that honestly needs to be upgraded, if not replaced?

DAVID MILLER: There are a couple of things I can talk about in this space. I think one of the key things is the department does not do the planning associated with the electricity system. That is the purview of Nova Scotia Power, and they have a team of experts much more skilled than Keith and me at the understanding of exactly where to expand and how. I know it's not unknown to Nova Scotia Power about some of the challenges that the Digby area has.

We've commissioned work with Dr. Lukas Swan at Dalhousie University to identify prospective areas for wind development that are both high wind but also different from the existing wind we have. As we know, the Digby County wind projects are some of the most productive in Nova Scotia, and that's using 20-year-old technology. The opportunity for large-scale wind is very high.

Connecting that would require an entirely new transmission line. I can't remember exactly if it's a 69-kilovolt line or a 138-kilovolt line, but it is certainly at or near the capacity for what the grid needs in that area. Unfortunately, as you can imagine, those kinds of upgrades are very expensive, and upgrades are determined based on the demand. If there's a growth of industries there, then you can justify the expansion because you're selling more kilowatt hours or you're generating more kilowatt hours, but that tipping point hasn't quite been reached yet. I'm not sure of the exact specifics, but I know that we've spoken with Terry Thibodeau from the area quite a bit on these challenges and we've looked at these in the context of tidal.

Nova Scotia Power is constantly evaluating both the existing distribution lines that serve individual homes and communities, and the transmission lines to identify where there are specific challenges with reliability or other components that need to be upgraded. That's part of the work that they're constantly doing.

What I think is changing is the cost of energy storage and the way energy storage for the electricity system could avoid some of those large-scale upgrades that would otherwise be necessary and bring both resilience to the local grid, but also enable renewables. If you think of it in very simple terms, if you put a big battery in Digby, you

could both fill it up with renewable electricity, and then you could be resilient against outages on that long spur line that travels through the area. That would help those communities economically and make everyone's lives better. It's not very difficult.

The point where batteries are cost-effective at that scale is very close. It's hard to know exactly when. The material costs are ever-changing, especially right now. Demand for batteries is growing in leaps and bounds, but as Keith mentioned, we also see that as driving that learning curve. Every time we double the amount of batteries installed on the system globally, we get that cost savings.

The advantage is that batteries are not just for the electricity system. People only build wind turbines for one purpose, to generate electricity, but people build batteries for everything. It's the development of lithium ion and the technology that Jeff Dahn has been working on that has enabled us to have phones and laptops that last hours and hours. The consumer electronics industry is driving the cost of batteries down. That's going to benefit the electricity system and the green economy.

I think for a place like Digby or rural parts of Cape Breton and other places that have reliability challenges or growth challenges associated with electricity infrastructure, the system now talks about non-wires alternatives - that there's something that can be done that isn't just stringing up a new wire and putting up larger transmission towers.

For very large-scale, that may not be an option today. But for smaller-scale, there's a place probably - if not viable today, very soon - that could enable avoidance of that long transmission upgrade. Not maybe for not a huge consumer of electricity in the system, but it could be used to help enable renewables - whether that's the tidal resource, which is obviously very strong in Digby, but also the wind resource. It could move them up the system or just help out that system. You could become even more renewable in that way.

THE CHAIR: MLA Boudreau.

TREVOR BOUDREAU: Very interesting take on all of this. Energy is fascinating. It's above my capacity at this point, but learning all the time.

We talked a little bit about that RFP and your expectation on the wind side of things - not so much in the solar. How else would the government plan on expanding the solar industry in this green economy in Nova Scotia? What other ways are we looking at developing that?

DAVID MILLER: Solar has undertaken the same kind of learning curve. We've seen prices drop very consistently. The technology gets better. The panels that people are putting on their roofs, the number of watts that each one generates has gone from I think around 200 or so just a couple years ago to 385 and now 400. The panel hasn't gotten much

bigger, but the ability to squeeze more electricity out of that same surface area keeps growing.

As Keith noted, the cost of panels is falling. It's stabilized a little bit, partly because of international trade issues, but the technology gets better. Even locally, we're seeing people developing new technology, so out of some start-ups here that are using what are called perovskites, which are more effective at converting the sunlight into electricity, or even layering those with other silicone technologies. We're seeing that industry change, and that change results in cost reductions. That's the primary piece that will enable us to drive more solar adoption here. We need that price to keep falling so that it becomes more competitive.

One of the things we've seen, when we compare ourselves to other jurisdictions, is that the install cost for residential solar in Nova Scotia in among the lowest in the continent. It's a little bit strange. We don't have the biggest industry, and we're certainly not the sunniest place. We're not the easiest to travel around. You can compare us to almost any southern state and our install costs are a little bit lower.

Partly it's that we have relatively low-cost labour, in some situations, but a lot of it is that the customer acquisition cost is absent here. There isn't someone driving around trying to sell you solar. The solar installers here are getting calls - cold calls every day, like "I want solar. Come give me a quote or just come and get me solar."

Installers used to literally go to your house, take pictures, measure your roof. Now they use Google Maps, so they go on Google Maps and there are tools - and some of these are locally developed here - that can examine your roof, examine the solar insulation that you would anticipate at that site, and tell you how big a system could be. It will design it. The whole thing is done - they don't even have to leave their computer. That has enabled us to reduce that cost.

That's an area that we've been focusing on and will continue to focus on, is reducing all of the soft costs, or the non-panel components that are associated. Doing so will reduce that upfront capital investment that people need to make. So that's one way.

We've been working with Nova Scotia Power and EfficiencyOne, who work with the Efficiency Trade Network to have their installers bring up these issues where they're finding challenges - whether that's provincial red tape, municipal red tape, or Nova Scotia Power red tape, as both a regulator and the safety inspector for this sector. We're trying to find ways to reduce those and minimize the pinch points or problem areas.

The other side of it that we're looking at is how we enable the growth of larger systems and enable more people to participate. There are lots of people who - for instance, I don't have a great roof for solar; it's just not oriented the right way. So I may not want to

put solar on my roof, but I might be interested in subscribing to a solar project or investing in a solar project in the community.

Unlocking that enables many more Nova Scotians - and one of the kind of classes we think of are people who rent who might want to go solar, or people who aren't sure how long they'll be in that house, or they think they might need a new roof. They can invest in a shared solar or community-scale project. They'll make a similar type of investment - maybe thousands of dollars - to get a little bit, or maybe they'll go big and offset their whole electricity use. In that way we can expand not just the people who want solar but then the people who are constructing it.

We can build a different market as well, that isn't just about rooftops but what we call ground-mount solar. People will be out there driving piles in the ground and putting the racking up to mount it. There's a big concern in Ontario about the use of prime agricultural land for solar. That was obviously a big issue in southwest Ontario. It's not quite as big an issue in most parts of Nova Scotia, the Annapolis Valley area notwithstanding, perhaps.

We have a lot of not-great land, or more importantly, we have brownfield sites. We can use brownfield very easily. This is a common process now. These are unproductive lands, or land that can't be used for other things. They call it brownfield to brightfield. Even on capped landfills, you can use different technologies to put ballasted solar. We've got some interesting conversations with people around some contaminated industrial lands in different parts of the province that could be used to generate clean electricity.

It's not just a great story - it's a great use of that land that can't support other uses. We're excited about how that all helps to enable the growth of access to solar, but then the businesses that can service solar, the types of labour resources and skills that can go into those solar projects, differences in engineering, the racking that panels are mounted on. All of that, a lot more of that, can be done locally.

At the end of the day, what we're importing is primarily those panels. As they get better and the prices fall, we can just keep accelerating this and growing it. We don't want a boom and bust. What we want to do is grow this sector in a sustainable way, that Nova Scotians can support it and Nova Scotians who want solar can gain access to it.

THE CHAIR: Thank you, Mr. Miller. Mr. Collins, do you have a follow-up to that?

KEITH COLLINS: Just quickly, if you took $3 as your cost of solar for a watt, 20 or 30 cents would be the cost of your panels these days. It has just plummeted. It's not really a major thing anymore. The HST you're getting off it is probably equal to the cost of the panel. That whole world has shifted.

[2:00 p.m.]

As David said, we spent some time thinking about how you're going to scale an industry up from only doing 20 or 30 or 40 installations a year in the entire province. We went after the soft costs, and marketing is the biggest one. You can see the cost of solar in Germany is this, and the cost in the U.S. is this, just because the Germans had a good marketing program and they just ran it out of government, and it just ate the cost - U.S., they're going door to door to door to door. You'd be paying, in that system, X-thousand dollars for someone marketing the solar to you.

We cut that basically out in Nova Scotia, which has been an astounding savings. It's one of the reasons that the systems going out there are quite cheap now compared to what they could have been. They've still got a long way to come down. Also, you need to get multiple installers out there. There are 75 now. It means you get some competition. Groups are not doing three installs a year, they're doing 30, they're doing 50. They just get much more skilled. They bring on more equipment.

Then, as David said, now we're looking at the opportunity to get some larger ground-mount systems. I believe the area projects have all been approved and funded. How many are under construction right now, David? Antigonish, Mahone Bay, and Berwick - the three municipal utilities went in together, and they're doing large installations. About two megawatts each, let's say, which is equivalent of 200-ish homes. These will be large ground-mount systems on less valuable land, on the whole, and it's a chance for the companies in Nova Scotia to get in, do the work, and learn the difference in scale - being on someone's roof or doing a small install and doing one of that scale which is an X-million-dollar individual project.

We're expecting to see some more of those drop into communities for community projects on old landfills, et cetera, or in some cases you'll see them around in intermediate size around farms and so on now, and other places where there is land that's not really useful for other things.

THE CHAIR: MLA Lachance.

LISA LACHANCE: I don't know who will choose to respond to this - perhaps Deputy Minister Gatien or Mr. Collins - but I think it has been really interesting and, frankly, quite inspiring to consider how the transition can also result in more local investments, a more just economy, a more circular economy.

One of the things I was wondering about was Community Economic Development Investment Funds and whether your department is involved in discussions about these models that could help drive the transition to renewables. Just by way of background, I think a report from the Co-operative Enterprise Council of New Brunswick found that an

investment of less than $700,000 by the Nova Scotia Government in 2019 actually netted $2 million in investments by Nova Scotians into CEDIFs.

I think this is building an opportunity to create financing options, but also, giving Nova Scotians an opportunity to invest locally. I'm wondering, is the department involved in discussions about these types of initiatives formally, and if you can tell me a bit about that.

KAREN GATIEN: I just want to say a couple of things. I know David has more information specifically on the funds. What I will say about a lot of this work is sort of like what I talked about earlier with respect to workforce transition. It truly is working together with a number of departments and our federal colleagues, right? Working in silence isn't going to get this done, so it's really pushed us as we should embrace, I think, to ensure that we do work with our colleagues at the Department of Environment and Climate Change, that we work with our colleagues at the Department of Economic Development. I already mentioned the training at Departments of Advanced Ed, and Labour, Skills and Immigration, but also with federal government to access whatever and all funding possible to support the transition.

Not surprisingly, Nova Scotia is one of the most dependent - if not the most dependent - on coal in the country. I think Saskatchewan and New Brunswick are colleagues in that area. We really are bearing disproportionately the brunt of right decisions certainly to get off coal, but we are going to need some help to do that. We're really looking at any and all opportunities to partner and to access funding to support the transition that we're making.

I will turn it over to David. I know he has something specific to your question he wants to say as well.

DAVID MILLER: We've had discussions about CEDIFs and the potential role, and we saw them really come to the fore in the Community Feed-in-Tariff program. A lot of those projects relied on the financial structures of CEDIFs to encourage and incent that investment, but also as a tool to bring together investors to build that critical mass.

For wind it's obviously more important, because the scale of investment is just that much higher. In 2013 through 2017, while COMFIT projects were being developed, we were at least $2 million per megawatt, so even a small project was $4 million or $5 million, and sometimes much more than that. Just to get the critical mass of investors together, it was really necessary.

There hasn't been a huge growth of CEDIFs in the solar space, but there is a solar CEDIF. The name eludes me right now, but that works on the financing side of the equation to help people access the financing necessary to invest in solar. We've certainly heard from people who are interested in how CEDIFs could help enable these community-scale

projects as a way to bring people together in collective ownership and encourage and incent that through the tax incentives that are associated with a CEDIF.

We set it as a potential role for almost any scale, whether that is at the community size or even a commercial-scale project that served a series of non-profits or community organizations or individuals as well.

There are other alternative financing mechanisms that we're also exploring. Because this is a really well-developed sector in other places - particularly it comes from the States - people were really reliant on their credit scores. If you're trying to finance a community solar project, they'd want to know the credit score of everybody who is investing.

Because solar has become much safer - and they know there's a lot of demand - some banks and other institutions, like credit unions in the States, are willing to take a lot more risk on these projects. So we don't see as much necessary demand for the use of a tool like COMFIT to enable those low-cost subscriptions that people could make, and the bank then helps carry some of that risk, or to help bring together the investment necessary, and then the bank would provide the debt to help backstop that project.

We see a lot of methods that could be useful in enabling solar access for people. CEDIFs are certainly one that I think will probably play a role in how some of these projects get structured and get constructed.

As the deputy minister mentioned as well, we see an opportunity for the federal government to work and help support this area. They have supported it through the infrastructure programs that we have, and the department manages to encourage some larger-scale solar development. That helps get these projects through that first stage and helps get local developers through those more complex learning about how to do a cost-effective ground mount or larger-scale project and building the supply chains to ensure that is available.

We see further changes. We've seen the federal government express quite a bit of interest in the transition and enabling the funding. We're still looking at how we can work with them to ensure that supports the initiatives that we have that can manage this transition. Solar in particular is a very labour-intensive sector. Even on a larger scale, it's probably five or ten times as labour-intensive as wind. It's not quite as labour-intensive as efficiency work, but it is still very substantial with about 10 jobs per megawatt of installed projects.

THE CHAIR: MLA Palmer.

CHRIS PALMER: Did you want to respond to that, Mr. Collins?

THE CHAIR: Mr. Collins.

KEITH COLLINS: We shouldn't ignore the First Nations communities who have very much come together on the economic development front. They are very strong contenders on the construction of wind for the 350-megawatt RFP that's out. As well, I know they're studying and reviewing, looking at solar and so on. They've pulled together joint activities, or sometimes the community with a private partner. There are a whole series of economic development mechanisms that they've pulled together that we think are looking increasingly competitive and strong across this whole economy that's opening up.

CHRIS PALMER: I'd like to bring my question back to the transportation side of things a bit more. We're witnessing a lot of very unsettling events around the world right now and how it's created a bit more insecurity in our energy. At the gas pumps, people really see what it's doing to the pocketbook. It's getting more people interested in electric vehicles.

My question is for Deputy Minister Gatien. Could you give us an idea of the initiatives and things that our government is doing to encourage more electric vehicle sales, and any other funding initiatives that the government has put out as far as for more charging stations throughout the province - and maybe a number of how many you may have seen put in over the last number of months?

KAREN GATIEN: I'm actually going to ask Keith to answer that; he has the details. We expected the question.

KEITH COLLINS: It's another one of these ones. I had my head under electric vehicles for 25 years, so for me this is a happy day, because when you had lead acid batteries, it was just ungodly and ungainly, and trying to make anything move with them was dire. Now, because consumer electronics has pushed the development of lithium-ion batteries so rapidly it's not going to stop. The price will keep going down. They will become more and more powerful, and after that an electric vehicle is almost a no-brainer. They have enormous acceleration and performance. They have 100 moving parts versus 1,000-plus in a gas vehicle. So, if the battery gets cheaper, electric cars are going to come faster and faster.

The fabulous thing in Nova Scotia is if you plug in an electric vehicle a day, it's the equivalent in use of electricity out of the pipe from Nova Scotia Power. You're paying the equivalent of 30 to 35 cents a litre gasoline. You're going to go as far as you are on a litre of gasoline, 30 to 35 cents. It's a great place to be compared to the volatility of imported gasoline and oil products.

What are we doing? The first thing, to be frank - I've worked in other jurisdictions and came home - people need to see vehicles, put their hands on them and actually drive

in them before they're going to believe it. You don't go from horse to car unless you've seen the car - that is just the simple goods of it.

We backed a program with the Clean Foundation that's gone out over the last three and a half years called Next Ride. It has been award-winning, and the aim was, to be blunt - I think our contract even may say it - it's bums in seats. It's get people in the car so they can actually see what they do, and then the 38 worries they have, 35 of them go away and they're left with three real issues that relate to electric cars. It might be range or charging time or whatever it might be, but it dismisses the myths for them.

Their job was, it was young people mostly, and they've gone around the province. They'll be down at Digby at whatever the local festival is with two or three different kinds of electric cars and they let people get in them to do test drives.

Another one of our aims was we tried to target young people. It would be great, we think, if everybody under 25 basically was getting a test drive so they knew when they bought that first car, because once you buy one you often tend to go back to the same dealers, et cetera.

So there has been all that work on education, and there are websites set up so you can compare and contrast cars and the cost. With the dealers, you go talk to them, they'd love to have them, but they're in other provinces. The electrics are being pulled into other provinces that have large incentives to offer. One of the decisions Nova Scotia made - the federal government had an incentive - was let's see if we can bring one in. It's not too fat, nobody here in Nova Scotia was going to appreciate giving out cheques for $18,000 or something for an electric vehicle like I think Ontario was doing for a time, but to give some incentive helped the dealers get cars on the lot and helped them have them available for people. That's been a real issue.

That has driven up usage, so every year, 500 or whatever new ones would be sold, but they're going out to 500 communities, and anybody who has an electric vehicle knows there's going to be 20, 30, 40 people wanting to drive it or ride in it. It's been a way to market.

We also do electric bikes - that has been a big thing. I'm older, I did not predict electric bikes would be a thing. Turns out Nova Scotia has hills and electric bikes are a real thing, so 1,500 or something sold last year - more than electric cars. You can see it in other parts of the world where it's hilly and so on. Up and down the Italian hills and everywhere else, places I would not have expected. Electric bikes coming in; electric cars incented.

I've worked a lot with HRM as they renew their transit fleet. This is a big project with Burnside and the other depot, Ragged Lake - I was going to say Wreck Cove, which would be really wrong - changing the buses over to electrics for this next generation. Again, you're putting in a dollar to help them bring them in earlier than maybe pure economics

would, but you're getting a huge marketing hit. Everybody sees the buses. If you've ever stood next to an electric vehicle as it's going down the street, it blows your mind because there's no noise, just the tires. When you compare that to a regular diesel bus, it's a big shift.

[2:15 p.m.]

Charging infrastructure is the bane of everyone's existence - how to roll that out, who should own it, what's the market going to be - and it is a genuine chicken-and-egg problem. Jurisdictions that build out 10,000 recharging stations and then only have 1,000 cars, the big media story is: Who are these special people who have 10 charging stations each? If you lag, people don't have quite enough charging stations. So somehow you have to try to hit the sweet spot, and during COVID, that's been almost impossible. If I can say the forecast - you don't know when COVID's going to end, you don't know if people are going to buying the cars, et cetera.

The aim is we have to build up and fund and support the growth. The first major set of installs was 13. Nova Scotia Power and Emera did them - 13 major fast-charge, the very fast-charge, Level 3 chargers that are spread almost equidistant around the province. There's been a series of federal government RFPs and partnerships with groups. I know Petro-Canada has one and has put a number of units out, Tesla does on their own. The three area municipalities won a contract with the feds and they're putting out dozens. We've supported putting them out in different individual communities.

Increasingly there are funds available to try to break open fleets, places that fleets are operating out of - apartment buildings, retail parking lots - just to increase the growth and get them out there. We understand there's a lag, but you're either lagging or leading. You're not going to get it exactly right. The aim is to keep expanding the number of programs and the depth of those programs, and hopefully the market will continue to pull the wagon.

In other jurisdictions, you're seeing large retailers just say, "charge for free." You go into your Walmart or whatever it might be, and you can charge up in the parking lot. Or there may be employers in places where they really want to get young employees who may have electric vehicles and they're going to put charging units in their parking garages and parking lots. We expect employers, utilities, private retailers, and communities will all help pull the wagon, so it won't simply be funded by a provincial government or by ratepayers or something.

THE CHAIR: MLA Kerr.

CARMEN KERR: Just going back to the Green Choice Program and the current RFP. In the initial draft, I understand that the cost or the price paid might have been up to 8.5 cents per kilowatt hour. I think it dropped to 5.5 cents per kilowatt hour. I guess I'm

wondering: Have you heard from applicants that that puts pressure on them, that they can't continue with the process? I imagine they've committed in the initial stages to programs in their own communities, or there are material costs that they have to think about, et cetera, for developers. Could you comment on that at all?

DAVID MILLER: I'm going back in my memory, which has a lot of numbers in it, so I may not have these exactly right, but I think it was initially set at $89. That figure was derived by CustomerFirst Renewables, the procurement administrator from Nova Scotia Power's Integrated Resource Plan, which was the anticipated cost for solar in Nova Scotia.

As a result of feedback that CustomerFirst Renewables received, they then lowered it to $66, I believe, and then subsequently down to $58. That $58 represents the cost of - it represents two things, really. One is the cost anticipated for wind in Nova Scotia, with a small inflation adder because the IRP is a couple of years old. This was before the most recent spate of inflation, particularly in steel, so it is a relatively low number.

That number also ensures that a project that is constructed today is at or less than the cost of coal. If we think of them as interchangeable fuel resources - and they're not quite interchangeable. One provides capacity whenever you want it, which is coal, but comes with GHG emissions and the cost of carbon. Whereas when wind blows, it's great. There are no carbon emissions and it's low cost, but you can't always rely on it on that February morning.

That was part of the rationale that CustomerFirst Renewables used - that there was a strong desire from the department and from stakeholders to see this RFP deliver not just renewable energy but low-cost renewable energy.

To your original question about how potential applicants feel, we're relatively certain that there are some folks who had projects that they thought would fit in this type of a process that no longer feel they can bid at that price. It's hard to know exactly how that has worked out, and we don't have the details on the bidders. We know that there are 25 bids at present, or that are intending to finalize a bid later. We don't know today which combination of wind or solar those are, so we don't know if people have found innovative project structures or federal funding, for example, to help reduce that cost to a level that would enable a solar project, for example, to compete.

In general terms, we've been developing this RFP for I can't recall how long - I was on leave for a bit of that. For several months, these processes - this is not dissimilar to how other jurisdictions do it. They start with a draft and then winnow it down and take stakeholder feedback and prospective project developer feedback into the design.

Renewable energy projects are developed over a relatively long period of time. There are projects in Nova Scotia that have been in development of some stage for probably a decade or more where people have started to acquire options to the land. They've put up

met mast, for example, to measure the wind speeds and have done the data analysis, and maybe have even started some of the environmental studies that would then feed into an environmental assessment. These are generally risks for companies, these are risk-based costs, and there are tax incentives from the federal government to help encourage them to do those early stages in terms of reducing the tax payable for them.

What I would also say is that if there are people who felt that $89 was where they could fit but $58 is where we've ended up, there will be future procurements. As the prices for those technologies change, as the comparator changes, as carbon pricing increases in cost and alternatives, we know what their costs are and then we can see those other projects coming. As solar costs decline further and people get better at that ground-mount style of development in Nova Scotia, we could see some large-scale solar become substantially more competitive.

Then there's always whatever the federal government does in terms of funding. They have a great program that we've co-operated very closely on, which is - I forget the acronym - from NRCan. We call it SREPs - I have to apologize, I've said the acronym so long that I forget what it's called. I can share the information with you later if you'd like. It is enabling lower cost renewables to be deployed onto systems as long as they meet certain criteria. We work to make sure our RFP dovetails with their criteria and dovetails with their process so that applicants here have the greatest chance of success in that federal program, and that the federal investments that are made benefit ratepayers.

It's no good for me to get federal money if it just inflates someone's profit. It's important that it actually benefits the ratepayers here. We did the same with the Canada Infrastructure Bank as well, which offers a novel financing mechanism to support renewable development, and we work with them specifically through this RFP process. They have a new design that they're working with proponents here, and they're effectively pre-qualifying proponents in this process, so if they get through the RFP, they can go to the Canada Infrastructure Bank and obtain that low-cost financing, if it's the right fit for them.

We've been using a variety of tools to try and ensure that where $58 is an aggressive price, there are other pieces that we've designed that might assist in helping projects achieve that.

THE CHAIR: We roughly have 22 minutes left in questioning. MLA Smith and then MLA Chender.

KENT SMITH: In the opening PowerPoint presentation, one of the slides talked about the upcoming renewable programs, and I'm finding a lot of the things you're talking about for programs and incentives and trying to get folks on the green side of the grid have to do with personal residences.

I'll start with Deputy Minister Gatien and you can direct it as you see fit. What are the programs and incentives that are available for businesses that we may have talked about a little bit earlier but can elaborate on, or that we haven't referenced yet?

KAREN GATIEN: I'll just say a couple of things, and then I think probably David could elaborate - and again if Keith has anything to add. If you remember earlier we talked about commercial solar, that's one, in terms of how we enable businesses and companies - small, medium, large - between the community solar and the commercial solar. They may be able to access lower-cost electricity through those means.

As well, following this set of procurement, there is another one planned which would be for larger-scale industries. It's still early days on that one, but we're kind of looking at what future procurements David mentioned - what opportunities we could enable for businesses.

DAVID MILLER: There are a couple of things I'll talk about here. The first one, perhaps, is not exactly an incentive. It's a program for businesses to develop their own renewable electricity, the Green Choice Program. As I mentioned before, this program enables a customer to choose 100 per cent renewables, but they wouldn't necessarily be the owner of that.

Simply, we envision it as someone puts their hand up - like the federal government - and says, "We would like to buy renewable electricity," and we say, "Okay. How much do you want?" It's 150 gigawatt hours per year. Then we would help to procure sufficient renewable electricity to provide them with that amount.

You wouldn't have a wind turbine up serving Greenwood. You wouldn't have something running solar panels on the Dominion Building downtown here, or anything like that. It would be a virtual product where you choose this, a wind project somewhere generates that electricity, and your bill reflects that. The final structure is something that we're still working through. We don't see this as a substantive cost increase for these customers, but they're very limited in their ability to generate their own renewable electricity on their own assets.

The federal government is perhaps a bad example. There's a lot of federal land they could deploy on. Someone like Michelin, for example, might want to go 100 per cent renewable to meet some of their corporate commitments around GHG reductions from their overall production. It would be challenging for them to do that on their own land, maybe not what their corporate parent wants them to invest in but choosing a green product.

We have seen this very successfully done in 17 or perhaps 21 U.S. states, where there are programs like this. They're often called green tariffs or renewable tariffs. When you hear about Amazon or Google or Microsoft buying renewable electricity, it's generally through one of these programs where they have committed to be the off-taker for a large

renewable project. It helps them mitigate risks. They're not necessarily renewable energy developers, they just want to consume renewable energy.

We are designing a structure that helps people like that choose renewable and ensure that the risks are fair and managed, but that electricity and the benefits of that electricity help all Nova Scotians. That will help us meet our 80-per cent renewable electricity goal. This isn't just that electricity goes to the federal government, and they're not part of the system. This is all part of the system, and they're still subject to all the system costs. It helps us reduce our GHGs more rapidly. It helps us mitigate the effects of carbon pricing as a result, as well.

We're trying to make that as easy as possible for businesses. If you make tires or if you govern Canada, maybe you don't want to be too deeply involved in deciding things about your electricity bill. We want this to be a relatively simple thing. The challenge is that it has to be for a relatively large customer in order to effect an appropriate procurement. We can't go to procure 10 gigawatt hours. That's the output of a tenth of a turbine. We're targeting this for larger customers who may not have that ability on their own facilities.

On the other side, talking about commercial net metering and net metering in general, is the space where we see the most flexible opportunity for those mid-size or commercial scale. We have seen this a lot. If you have been in Ontario, a lot of warehouses have solar on the roof. It's the perfect place for solar. It's really effective, and it can meet some of their energy needs. They can export some to the grid, or they can pair it with a battery, or they can redesign their systems like IKEA has done to feed more to their hot water system or to supercharge their air conditioners - all those pieces.

That's really the space where we see commercial deployment. We're not as focused on direct incentives like we have done with solar homes, but in terms of ensuring that the processes are as simple as possible and eliminating red tape. Businesses generally have tax incentives as a result of the federal rules - that they can use this as an investment that they can write off, at least to some degree. There are benefits that accrue to them there in addition to the energy savings benefits. We see that they can begin to pair those with low-cost batteries, and they can also reduce their demand charges or more flexibly use those renewables on site.

The other part that we're looking at is what the appropriate system design is for commercial net metering. Commercial net metering today is very similar to as if you had it on your house. There's not a huge amount of difference. We're looking at what that will look like in the future and how we can ensure that it enables more projects and enables people to do what is right size for their consumption, as opposed to the limit that's currently in place being 100 kilowatts, which I will point out is not a very small number. Most houses can't install more than 10 kilowatts, so 100 kilowatts of solar is a substantial investment today. But there are businesses that would like to do more.

[2:30 p.m.]

IKEA is the example we keep coming back to. It's one of the only ones that's that large, but we certainly see that that appetite is there without government having to provide any specific direct financial support, just to make sure that the processes and the rate structures and the design are there for them to take advantage of.

THE CHAIR: MLA Chender.

CLAUDIA CHENDER: Before the meeting is over, I do want to also ask about solar. I guess the question we have, which of course is against the backdrop of Nova Scotia Power's application and the kerfuffle that arose over the proposed system-access fee for solar customers, which thankfully was walked back. We've put in lots of FOIPOP applications and we recently put one in just to kind of figure out what the conversation is around solar net metering issues. It became clear that the department and NSP are in some communication around solar. There had been some communication around interconnection process and streamlining and whatnot.

As we look at Nova Scotia Power as a publicly-regulated utility - this is for the deputy minister, but anyone can comment. Is your feeling that our current regulatory framework is sufficient to ensure the alignment of Nova Scotia Power with our goals for renewable energy?

We have these very robust goals. We've been really glad today, and lots of times, to hear about all the expertise and hard work happening in the department. We hear very little from Nova Scotia Power, and then we see things like this system-access charge that comes out of nowhere, and seemed to come out of nowhere for all of you as well. We know that right now, under the NSUARB, in fact, Nova Scotia Power can't really take sustainability into account, or our sustainability mandates. It's not part of the regulatory framework.

Do you feel like there could be a productive shift in that framework, or do you feel like it works fine?

KAREN GATIEN: What I would say, in terms of the current process - we have registered as active interveners. It's a very lengthy submission that Nova Scotia Power has put in. We're going through it all and certainly will examine it with a lens of how to protect ratepayers.

We do have confidence that the NSUARB will do the same thing, that they will thoroughly review the information and receive all of the submissions, hear all of the testimony, and certainly keep the welfare of ratepayers in mind. At the same time, we are looking at what all of our options are presently to help protect ratepayers as well.

DAVID MILLER: I'll just add a little bit on the regulatory piece. I think it's important. We've certainly received correspondence related to the initiation of a sustainability mandate or a sustainability advocate for the Utility and Review Board. There are a variety of ways in which regulators are bound by environmental commitments.

One of those is, the Utility and Review Board is bound by the laws of Nova Scotia. When Nova Scotia Power proposes a project that is consistent with meeting the renewable electricity standard, for example, or meeting the air quality emissions, the NSUARB takes into account that this may be expensive. It may be very expensive to mitigate mercury emissions from coal burning, but it is necessary. The board really looks to the laws and regulations that are present today.

I think that looking at how Nova Scotia Power has made investments in the past and what has been approved with respect to the use of even low-sulphur fuel in their coal plants or the addition of other mitigation measures for air quality emissions - that's one example of the board recognizing that sustainability is part of that, based on what the laws of the day are. I think that the board, in the current general rates application and all proceedings, will look to the Environmental Goals and Climate Change Reduction Act as a series of goals and targets through new electricity regulations that will set out the 80-per-cent renewable electricity standard. So if a project is proposed, they consider those as part of that.

I'm not suggesting there's no merit to assisting the ability to approach it in another way, but this is how the board operates today to take into account those components.

THE CHAIR: MLA Boudreau.

TREVOR BOUDREAU: I'll make a comment before I ask my last question. I am a former board member of East Coast Credit Union, which actually several years ago was a company that said we want all of our energy to be produced by green energy and had worked with Bullfrog Power to be able to do so. All of their branches and all of their infrastructure is all run by green energy, so it can work and things can be done.

We've talked quite a bit about wind, we've talked quite a bit about solar, a little bit about tidal, so I'd like to ask about other forms of renewables. Can we expect more tidal energy in the province? Is offshore wind something that we are considering?

KAREN GATIEN: As I mentioned earlier, certainly it's an emerging sector with respect to tidal. We're certainly really encouraged by some of the early work that has been done, irrespective of the one abandoned turbine. We'll get there.

We think that it's really a promising sector and certainly it's a long-term project. We're still in the very early days of it. We're very encouraged about that, and we are also looking to see what we can learn about working in a marine environment and use it for

things like offshore wind. What we've heard loud and clear is that Nova Scotia is uniquely positioned, in terms of its wind capacity here and the benefits of wind energy that's possible.

This is obviously not my area of expertise either, but I've even heard it said that we operate a lot like an offshore wind environment because we're so small. When we say we're looking at all options, certainly offshore wind is on the table as well. But there's a lot of things that need to be put in place, of course, because it is operating in a marine environment and it involves our colleagues with the Department of Fisheries and Oceans, provincially and federally, and a number of other areas of work. I don't know, Keith, if you had anything you wanted to add.

KEITH COLLINS: Just in terms of the technologies and the curves, offshore wind is one which lagged onshore wind, obviously, and it looked like it was going to take a long time to catch up. It surged and the big movement of the oil companies and so on - they were switching their capital spending over from offshore oil, in many cases, over to offshore wind - has sped this process. It's getting cheaper but if you think of Nova Scotia, really Nova Scotia is offshore. Like, the onshore part of Nova Scotia is offshore for the rest of the continent. We have really good wind and it's pretty easy to access in a lot of places, so it is still substantially cheaper than offshore wind would be.

But for offshore wind, the curve is coming really fast and five years, 10 years, 15 years, projects being built further out are quite likely to be cost-competitive. The question then is what would the energy be used for? Would it be used in our grid? Would it be used to produce hydrogen? Would it be used for export to other jurisdictions? Everybody around the world is dealing with these same components and trying to get the time frame right.

We also have lots of other users of the offshore and lots of other interests that are in play. There is a whole regulatory and consultation and discussion process that has to take place there. It's very hopeful in terms of the speed at which it's coming down.

I think tidal is another one. The big issue there, really, is this is an astonishingly hard thing to do. That's just the straight goods of it. I mean, when you see the comparisons, the amount of force on some of these tidal turbines is they are dealing with the equivalent of sort of a Harrier Jump Jet when it goes up vertically, so everything must be able to hold that amount of force, 24/7, 365 for 20 years.

It's a really difficult environment and I think the expectations maybe ran ahead for everybody in Nova Scotia. Everybody's hopes were a little too quick, but there are definitely a number of companies that are out there now, working, testing, and producing power with a range of designs. It isn't something that you think of in terms of - just so we level-set our expectations. It's not replacing coal in a year or two, but it is absolutely something that we should be putting money into, the development and research and rollout of these kinds of projects. Same with offshore wind. It's not replacing our system on a cost

competitive basis in the next 12-24 months, but if you start to look out a few years, the lines start to get a lot closer. That's the two on those technologies.

I just want to come back quickly on the solar one and Nova Scotia Power. It's a universal problem. When you have large-scale tech change and the scale of it is different, this is distributed energy, and the same as the internet and computing power went through distributed intelligence, and how do you wire that together, and what's the role of the older companies, pre-existing companies. So Nova Scotia Power - fabulous at running coal plants, but they really are genuinely, extremely good at running coal plants. Then you have that knowledge and the systems built around that, and what can they do with those assets and skills to adapt and complement a new environment.

It's very difficult for every jurisdiction. I can tell you, when you work in Manitoba, they want to build hydro dams. In Ontario, they want to build a nuclear plant, the existing staff and engineers. The process of technological change and the change going on in customers' heads, citizens' heads, is a big one, and every place has to wire that together. It's bumpy; it's a bumpy process. The same for governments. We'll get there.

THE CHAIR: We have about four minutes left. MLA LeBlanc.

RONNIE LEBLANC: With the price of fuel fluctuating a lot, we hear a lot of discussion about a carbon tax, but here in Nova Scotia we have the cap-and-trade system for now. Could you elaborate on what impact that's having on the province, and how it's going to help us achieve our climate targets?

KEITH COLLINS: The biggest thing you're doing with the cap-and-trade system or a carbon tax system is you're sending a signal, we as a people, as a jurisdiction are taking this seriously. We have to build a cost. Sadly, I was trained as an economist, so I spent a lifetime talking about externalities and how you wire that in, et cetera. The cap-and-trade system is just an attempt to do that. In Nova Scotia, it's already working in terms of making people and organizations think more seriously about the cost, and what will the cost be. Obviously, the federal government is dropping in its laws with an increasing cost.

What it tells us if we're working electricity is we should be moving at full speed away from the fossil fuels over to wind, et cetera. If we could have them yesterday, that's the ideal time to have them built. We need to move these very rapidly, and we're trying to do that in a way that is affordable.

You'll also look out - people will say, oh, the price of carbon's going to be $170 in 2030, which it is. That's huge, but it's very hard to project in 2022 what the cost of the technologies, the other alternatives, are going to be in 2030 because these lines are moving and crossing at different rates. You do what feels close to a no-brainer. By the time everyone is shouting at you, "Where are you? Why don't you have this done?" you should be doing it. You're trying to lay the groundwork and research the next steps.

I think, in electricity, we'll get there in Nova Scotia. We should get to 70 and 80 per cent renewables fairly straightforwardly. Like, there's a line of sight on that now, and a carbon price will help us.

[2:45 p.m.]

What particular shape that takes, and what particular form discussions with the federal government result in, obviously there are implications and options by the hundred in there. Does money cycle this way, does it go that way, do you give people slack over three years or over 10 years for the timeframe to balance out? That's largely - thank you - over in the Department of Environment right now, so they get to deal with that on a day-to-day basis, so good luck to Jason Hollett and co. That's it from us in Department of Energy and Mines. (Laughter)

THE CHAIR: Wonderful. We have one minute left, MLA Lachance, if you want to.

LISA LACHANCE: I'll just hop in quickly. I was going to return to the theme of green jobs, and to talk about equitable transition, as well. We have the stats - women, immigrants, racialized communities participate in the trades at much lower rates. I know you have explained the ecosystem that exists around this issue, but I guess just wanting to register that that's a priority, as well as to use this green transition to actually create a much more equitable workforce in the energy sector in Nova Scotia.

If you have any comments in the 20 seconds we have left about the work in that area, please go ahead, but otherwise, I just wanted to register that.

DAVID MILLER: I'll try and speak briefly, but there's lots more that we can say on this. This is certainly a really present issue for the department. We're signatories to the Equal by 30 commitment and we're really focused on understanding the implications of the transition and trying to make sure that our programs are all designed with that in mind.

In our current RFP, we provided substantial points to projects that have Mi'kmaw ownership, and that support more than one Mi'kmaw community, even more points. We also have points that are associated with support for equity, inclusion, and diversity in project ownership and project teams, project development, and community benefit as well.

We're also working to ensure that our training to get into solar - so when we first started the SolarHomes Program, we didn't just provide the incentives. We worked with the Nova Scotia Community College to design the training, so that people had the right safety approach to installing solar. It's not a complex industry, but there are still some requirements. We had specific sessions for Mi'kmaw and other communities in Nova Scotia, other racialized communities, to ensure that they had direct access to training at no cost so that we could start to build that kind of nexus.

The same is true with our work with Efficiency Nova Scotia's work with Mi'kmaw communities on the Mi'kmaw home energy retrofit program to ensure that Mi'kmaw installers are getting the training to be the ones delivering that program into the future. We have more initiatives, but I expect I'm out of time.

THE CHAIR: Looks like our time has concluded for Q&A. I ask the witnesses if they have any closing remarks, starting with Deputy Minister Gatien.

KAREN GATIEN: I just very briefly want to say thank you very much. We're very proud of the work we're doing. Like yourselves I'm sure, we think it's very important for Nova Scotia, as well as the future. I'm a mom of two young adult children, so we all want to make sure that the environment is left in better shape than it was otherwise going to be. We're really excited about the work ahead. It's daunting, but we'll get there. As you no doubt can tell, I'm surrounded by a lot of expertise in the department, so really encouraged by that.

THE CHAIR: Mr. Collins or Mr. Miller, do you have any closing remarks?

KEITH COLLINS: The one comment I have is I think people should take a lot of pride in Nova Scotia. I worked most of my life in other jurisdictions - Ontario and Europe and so on - but it has been a long progress of all parties supporting various pieces of work, and there's lots of debate about how, but it has been fabulous to come home and actually see the amount of support for moving ahead. There can be all kinds of warfare over how we do it, but the moving ahead is taking place every day, and that has been a wonderful thing to experience.

DAVID MILLER: To build on some of what Keith said, one of the exciting things that we've seen, this is true everywhere, is that when someone has an electric vehicle, people ask them about it. If you drive an EV, someone will ask you about it. I was in a parking lot recently and I was, look, there's a new Mustang Mach-E. They're not very common in Nova Scotia. There was someone there talking to the owner. I thought maybe I shouldn't also intervene.

The same is true for solar. The same is true for wind, and that's why some of our initiatives like the Community Feed-in Tariff has effectively introduced communities across Nova Scotia to wind at a community scale, so they can understand the impacts, the benefits. For some it is not an impact they want to tolerate, but for others it's something they can take pride in and take pride in ownership of. We see that through the area municipalities. They got into wind and they said, this is great. We should do more, and now they want to do even more.

There's a lot of excitement that builds, and when you get to see your neighbour put up a solar panel, you're going to ask him about it. You're going to ask him about what that cost, what the benefits were, how did you get there. The same is true of heat pumps. I think

Keith said there are 30,000 a year installed in Nova Scotia. I think I heard this morning that the statistic for Germany is 150,000. There are 80 million people in Germany, and we are about a fifth of where they are in terms annual installations. That just shows the commitment of Nova Scotians to these technologies and to learning from each other.

That's where this building an understanding of this new world is what's really important. People change when they understand that other people have that same view and that they can adopt that same technology in their house. Their houses are not all that dissimilar. There are some more challenging houses across the province, but people can see those benefits and they can understand them and really appreciate them. We just need to keep growing that mass of people who understand and want to invest. We can leverage Nova Scotians' own money but also their own interests and their commitment to this.

THE CHAIR: Thank you to the three witnesses for today for answering our members' questions. I invite you now, if you would like, to leave the meeting, and we're going to continue. Thanks again, folks.

Going into the agenda, is there any other committee business? I'm seeing none.

Our next meeting is Tuesday, May 24, 2022, from 1:00 p.m. to 3:00 p.m. The topic will be small woodlots and the value of ecological forestry. Our witnesses will be from the Department of Natural Resources and Renewables, Nova Scotia Woodlot Owners and Operators, Western Woodlot Services Cooperative, and the Confederacy of Mainland Mi'kmaq.

If there's no other business, I adjourn today's meeting. Thank you.

[The committee adjourned at 2:51 p.m.]