

HANSARD

NOVA SCOTIA HOUSE OF ASSEMBLY

**COMMITTEE ON
NATURAL RESOURCES AND
ECONOMIC DEVELOPMENT**

Tuesday, June 25, 2019

COMMITTEE ROOM

Green Jobs and Economic Development

Printed and Published by Nova Scotia Hansard Reporting Services

**NATURAL RESOURCES AND
ECONOMIC DEVELOPMENT COMMITTEE**

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Claudia Chender
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[Bill Horne replaced Brendan Maguire]

In Attendance:

Darlene Henry
Legislative Committee Clerk

Gordon Hebb
Chief Legislative Counsel

WITNESSES

Department of Business
Bernie Miller - Deputy Minister

Ecology Action Centre
Emma Norton - Energy Conservation Coordinator

Canadian Solar Industries Association
Lyle Goldberg - Policy and Regulatory Affairs Manager



House of Assembly
Nova Scotia

HALIFAX, TUESDAY, JUNE 25, 2019

**STANDING COMMITTEE ON
NATURAL RESOURCES AND ECONOMIC DEVELOPMENT**

1:00 P.M.

CHAIR
Suzanne Lohnes-Croft

VICE-CHAIR
Hugh MacKay

THE CHAIR: Order. I call the Standing Committee on Natural Resources and Economic Development to order. Today, the committee will be receiving a presentation from the Department of Business, the Canadian Solar Industries Association, and the Ecology Action Centre.

My name is Suzanne Lohnes-Croft. I'm the MLA for Lunenburg and I'm also the Chair of this committee. I ask committee members to introduce themselves.

[The committee members introduced themselves.]

THE CHAIR: I'd like to remind people to put their cellphones on vibrate or silence. Photos can only be taken by the media. Should you need to use washrooms or refill your coffee or water cup, the anteroom is just to my left. Also, should we have an emergency and need to evacuate, we will evacuate via Granville Street, make our way to the Grand Parade, and meet in front of St. Paul's Church.

I would like to let witnesses know that I need to recognize you before you speak so that your microphone can be turned on for Hansard's purposes. We will begin our presentation. We'll start with Deputy Minister Bernie Miller with his opening remarks.

BERNIE MILLER: I've been asked to restrict my comments to two minutes, so you must have heard me speak before. (Laughter)

THE CHAIR: We've expanded on everyone's time to speak today.

BERNIE MILLER: I'll start by just describing the mandate of the Department of Business broadly. Our role is to work collaboratively to develop and implement the province's inclusive economic growth strategy. Part of that inclusive economic growth strategy has a cross-cutting principle of sustainability. Sustainability is at the root of green jobs, which is the subject matter of our meeting today.

What we do at the department is develop policies and programs, but we don't implement the programs. Those programs are implemented primarily through Crown corporations - so primarily Nova Scotia Business Inc., Innovacorp, Develop Nova Scotia, and Tourism Nova Scotia - but in our mandate, our objective is to convey the strategy of the government of the day and ensure that the policy and program initiatives are being implemented in such a fashion as to meet the key objectives, and inclusive economic growth and sustainability are two key elements of strategy.

Our approach is to regard government's role as being limited, enabling, and collaborative. We want the entrepreneurs themselves and not government to lead economic development. At the same time, government needs to do its part, including maintaining a stable and predictable fiscal and regulatory environment, investing in public infrastructure - transportation, high-speed Internet, and other infrastructure that supports public services - and very importantly for the future, investing in education, workforce and development, and research and development. Much research and development will lead to new innovations that support the development of green jobs. That's a particular area of interest.

Our general approach is not about specific business development or development of specific sectors. It's about inclusive economic development. As I mentioned, it includes environmental sustainability and diversity - things that should always be associated with economic growth. That's kind of rooted in the principle that the economy and society are interlinked, and you need to have an economic development approach that creates opportunities for everyone.

According to the United Nations, a green economy is defined as a low-carbon, resource-efficient, and socially-inclusive economy. For Nova Scotia, we believe the health of the economy, the environment, and the people of Nova Scotia are interconnected.

Green jobs are not so much a sector as a characteristic of a healthy, diverse, inclusive, and sustainable economy. In Nova Scotia, we have a number of natural competitive advantages. We have growing sectors like the agri-food sector, which was mentioned in the introductions. We have the ocean sector, which is emerging, and much of the work related to oceans and ocean technology are almost by definition sustainability-related matters or green job-related opportunities.

Then we have local businesses like local wineries, craft breweries, fishing and fish exporters, and I've already mentioned the farming and agricultural opportunities we have, as well as forestry and other industries. Each one of the industries that I've mentioned, in order to be effective, have to build sustainability into the manner in which activities are undertaken.

We have a growing ocean tech sector, driven by the Centre for Ocean Ventures and Entrepreneurship, along with significant growth in Nova Scotia in clean tech or what people tend to call clean tech - businesses whose primary purpose is to create new opportunities, particularly to reduce carbon or to reduce emissions. We have things like wind, tidal, and solar.

Also, Nova Scotia is a global leader in energy storage. The potential for energy storage is a testament to the importance of research and development. We're very fortunate in Nova Scotia to have Dalhousie University and Jeff Dahn who is recognized as a global leader in battery technology and energy storage. Because of his capabilities, he has been able to attract Tesla, a major corporation, to do some research and development in Nova Scotia - just to give an illustration.

Many of the start-up companies that are getting their start in the Nova Scotia innovation-driven entrepreneurial ecosystem are born sustainable and born global. One example that comes to mind is CarbonCure Technologies, which in 2007 emerged out of Dalhousie University's research. CarbonCure Technologies has developed a way in which carbon can be captured in concrete. They're attracting global interest because of the ability to address a serious global problem but do it in a way that is creating commercial opportunity and a positive environmental outcome at the same time.

I'm sure we'll get into more specifics later, but I just wanted to highlight a few things that Nova Scotia should be particularly proud of when it comes to making our economy greener and more sustainable.

The signs of an improving economy are actually present in Nova Scotia, and I think that's a testament to the fact that having an inclusive, sustainable approach creates jobs, rather than costs jobs. There are more than 1,400 jobs and more than 200 businesses in the energy-efficiency industry in Nova Scotia. More than 50 jobs have been created in the solar industry just over the past six months as a result of the SolarHomes program - I'm sure we'll hear more about the opportunities in solar. Nova Scotians have invested roughly \$4 billion in a cleaner energy future through community feed-in tariffs for wind, the Maritime Link, and energy efficiency.

The signs of an improving economy are evidenced by record-high population. One thing I've noticed when I look at the data is after 30 years of consistent out-migration of people between the age 25-to-54 cohort, which would be kind of core working years, we're gaining people in that cohort of population, meaning that there are either opportunities being generated in this sector or other sectors that are giving people the opportunity to

either stay in Nova Scotia or relocate to Nova Scotia. That has manifest in record low unemployment and rising workforce.

I should emphasize that the population growth and the workforce participation and workforce growth is not something that's restricted to Halifax. It's being experienced - not at the pace that we would necessarily like to have it, but when we look at the counties of Nova Scotia, 10 of 18 counties are experiencing population growth - many for the first time in decades, which is a sign of strengthening opportunities in things like the agricultural sector and other, what would be considered, rural-based opportunities. The other point to note is the record levels of immigration from other provinces and other countries, which is also a good indicator of the increase of opportunities in Nova Scotia.

There's much to do. We have to continue as a department to work across government departments to ensure that barriers to equitable participation in the economy are removed, that our approaches to economic growth are founded in sustainability - as the principles of the Environmental Goals and Sustainable Prosperity Act speak to - and foundationally, that this growth is inclusive, that's it's not restricted to specific geographic regions, and it's not restricted to specific demographic groups. There's a lot of work to do on that.

An economy that is diverse, inclusive, and sustainable ensures that people will benefit most from economic growth, and in today's world, it's less about natural resources below the ground and more about those natural resources above the ground - Nova Scotians. Thank you for the opportunity for my opening comments.

THE CHAIR: Thank you, deputy. Professor Dahn comes from Lunenburg County.

We'll move to Emma Norton. Can you introduce yourself and describe why you're here and do your presentation?

EMMA NORTON: Thank you very much to the committee. My name is Emma Norton and I work at the Ecology Action Centre. We're an environmental charity here in Halifax in the north end. We work on a variety of different issues from climate justice to biodiversity to fisheries. Today I'd like to present to you about green jobs.

My presentation isn't actually the one that's up there . . .

THE CHAIR: Why don't we switch and do Mr. Goldberg's, and then we'll come back to you?

EMMA NORTON: That sounds great, okay.

THE CHAIR: Mr. Goldberg, would you like to introduce yourself?

LYLE GOLDBERG: My name is Lyle Goldberg and I'm the Policy and Regulatory Affairs Manager for the Canadian Solar Industries Association. My job is to grow solar in Nova Scotia. I'm the only employee that resides outside of Ottawa. My salary is actually funded by the Department of Energy and Mines. I've been at this job since July 2018, so I'm very excited.

[1:15 p.m.]

Just a brief backgrounder. We're a national industry association. We've been around since 1992. We have about 270 members across the country and about 13 members in Nova Scotia and trying to grow that. We work collaboratively with all orders of government: utilities, regulators, and various stakeholders. We raise public awareness on the benefits of solar, so we're actually working with Efficiency Nova Scotia now on a Nova Scotia Go Solar guide. This will be handed out to people that are interested in going solar. It provides a lot of information for them.

We offer a consumer protection program for solar installers that are members. If a homeowner has an issue with an install, we bring the installer and homeowner together in a dispute resolution mechanism to avoid legal costs. I guess that's it as a description for who we are.

Just quickly - the benefits of solar. Most of you know the answers to these things, but of course solar reduces our electricity bills. It promotes energy independence, so having the Maritime Link is great. We're going to be at least 40 to 50 per cent renewable by next year, but I think solar offers an element of independence where we're not relying on other jurisdictions for our power, so that's a huge piece.

Zero emissions in the production of electricity. We recognize that it's not zero emissions to produce a solar panel or to bring it over from China. There are emissions there, but in terms of electricity production, zero on that.

Increasingly affordable - with the SolarHomes program, now is the time to do solar on your home. That being said, the cost of solar has dropped over 70 per cent in the last 10 years and continues to drop. The goal is that by the end of the SolarHomes program, the cost will be affordable enough that we won't need a program in place. That's the goal.

It creates a lot of local jobs throughout the province, and I'm going to talk about that because I did hand out to everyone our recent report called the Nova Scotia Residential Solar Market Outlook and Labour Force Study. You should all have a copy of that, and I'm going to talk a little bit about that.

Solar is flexible on scale and location, unlike wind. Wind has to be built in the middle of nowhere often. A large solar project can be built close to transmission lines, so

it's a lot cheaper to do. Also, as your electricity needs increase, you can add more solar panels to a project, so it's very scalable as well.

Advantages of solar sector jobs and renewable jobs in general - if you go online there are a lot of stats and figures on this stuff, but generally, if the same amount of money is invested in fossil fuels versus renewables, way more jobs in renewables. Every report is saying this now. That's a huge benefit. They're long-term and stable. They don't require a harvesting resource, and it requires technicians for both installation and maintenance. Although I would argue on the solar side, there's very little maintenance involved once your system is installed. More so probably on the utility scale side that you would require that, and certainly on the wind side. They create jobs in urban and rural areas as well. Half of the solar home applications are outside of HRM so we're seeing a lot of installs in rural Nova Scotia.

In terms of the global growth of solar, even though solar represents about 2 per cent of electricity in the world right now, it's the fastest growing segment, and over three million people are employed in installing solar PV. In the U.S., it's going to be the fastest growing occupation. I think wind is the biggest right now, but solar is going to surpass that.

The estimated revenues are around \$86 billion and projected to hit \$422 billion globally by 2022. We have 59 solar installers on the solar trade network that can install under the SolarHomes program now. When the program started, I think we had 17.

I'll talk a little about the job creation numbers. In our report, we estimate that by 2030, we could produce close to 2 per cent of electricity consumption through solar, and it could actually be up to about 170 megawatts of installed capacity, creating up to 1,170 jobs and displacing 960,000 tons of GHGs over 30 years. We're expecting solar to be installed in about 22,000 homes by 2030.

This is a sample of some of the solar companies that are part of the solar trade network, and a number of these are CanSIA members as well. A lot of them are electrical companies that are doing solar as well.

One of the key areas for solar growth in Nova Scotia is to make sure that with the SolarHomes program we discount the rebates slowly over a longer period of time. In our research in our report, this is the option we recommended, and Efficiency Nova Scotia is following this model now. They started off at a dollar per watt rebate. I think they're down to 85 cents now. The idea is to gradually reduce it over time, so at the end of that, the market price will be such that we won't need the program in place anymore. It looks like they're following that trajectory.

This will give you an idea of the solar supply chain. The figure is we create about 25.6 jobs in the solar industry per megawatt generated, so we can reach up to over 1,100 jobs by 2030, most of which will be in the solar installation area, as well as sales and customer acquisition. We actually have three large solar distributors based out of Ontario

and B.C. that have set up shops in HRM now, as a result of the SolarHomes program. We have opportunities for manufacturing somewhat - not the panels, but other parts of the solar system can be manufactured here. We also have R&D, as Bernie had mentioned. Dalhousie is doing a lot of R&D research on solar and battery storage, as well as the Nova Scotia Community College.

A couple of emerging areas attached to solar are storage. We see the future of storage more on the commercial and utility scale side more so than the residential at this point. So by 2030, we're projecting up to about 30 full-time jobs. There's not a lot of demand for residential solar, unless you are off the grid, there's not a demand for storage because of the net metering program that connects you to the grid when you need power, if you're not producing enough.

EV chargers - Nova Scotia Power is projecting 38,000 to 100,000 EVs in Nova Scotia by 2030. That's going to create a lot of jobs in EV home chargers, which are the same plug as you would plug into a refrigerator. It's that kind of plug that would charge your car, and it's about an eight-hour charge for that. It's better than a regular plug, but it's not as good as the high-speed chargers that Nova Scotia Power has put in place across the province. So we see opportunities there.

The federal government moving to 100 per cent renewables for all their operations - a huge opportunity for Nova Scotia. The DND properties are largely powered by fossil fuels. This is a high priority for the federal government, and we project 180,000 megawatt hours contributing \$200 million to the local economy and 1,000 jobs. I'm actually meeting with some DND reps this week to talk about the RFP that they're going to issue because we envision a lot of solar jobs in Nova Scotia as a result of that.

We're also recommending that the province mirror the federal government's initiative by doing 100 per cent renewables for their own provincial buildings. We're also going to work with our partners on encouraging municipalities to do some solar as well.

Solar skills and training - there are a lot of new entrants to the market. The community college has actually set up a solar training program - an introductory program, which is great, but right now there's a hodgepodge of solar training programs across the country online and in class. We would like to look at ways of marketing and advertising those areas of training and maybe create a hub for training in Nova Scotia.

We're also working with Electricity Human Resources Canada on a solar certification model for Canada, which I think would be very helpful.

Just to summarize, CanSIA is very pleased to have a presence in Nova Scotia. We can address the needs of the local industry while working with the province, utilities, and other key stakeholders. We see a very bright future for solar in Nova Scotia, like I said, with over 1,100 jobs projected by 2030. These will be jobs from Yarmouth to Cape Breton, not just in HRM; by 2025, 100 per cent by the feds represents another huge opportunity.

We're actually looking at doing a similar solar study on the commercial side for Nova Scotia. That will look at the barriers and how we move forward with growing solar on larger buildings across the province. We're looking at doing that in the near future. Thank you.

THE CHAIR: Thank you, Ms. Norton, for being so patient. You have your presentation coming up - I'll give you the floor.

EMMA NORTON: Thank you for having me today and for having this discussion. I have a very simple presentation that I put together, trying to stay below the two-minute limit, but it's nice to know we have more time because it's very easy to talk for more than two minutes.

Just in case folks don't know, the Ecology Action Centre is an environmental charity. We have over 40 employees; 6,000 members help us financially by paying membership to us. We work out of the north end of Halifax, but we have some satellite offices throughout Nova Scotia and one in New Brunswick. We do work municipally, provincially, federally, and internationally.

Diving right in, there's a distinction I want to make today between green jobs and climate jobs. Climate jobs are a kind of green job. Climate jobs directly reduce greenhouse gas emissions, and there are examples like the solar industry that Lyle was just talking about, public transit, sustainable transit, and the energy efficiency industry.

Green jobs contribute to a more sustainable world in a broader sense. That includes teachers, nurses, postal workers, long-term caregivers, et cetera - people who have a very low carbon content, low carbon impact. This was actually alluded to by Deputy Minister Miller, in talking about the kinds of jobs we can think about as our human resources.

Green jobs and climate jobs already exist. Here in Nova Scotia, we have 1,400 people working in the energy efficiency industry. Across Canada, there is already 436,000 jobs in the broader energy efficiency industry. That's more than twice the amount of people that work in oil, gas, and all forms of extraction, including mining.

Lyle also pointed out that in solar, per million dollars invested, you get a lot more jobs by investing in solar than you do by investing in fossil fuels; by investing in energy efficiency specifically, you create even more jobs. You create about 16 jobs per million dollars spent versus the seven jobs in solar and the 2.3 jobs in oil and gas.

The Ecology Action Centre is very interested in seeing the renewal of EGSPA and in setting a target within EGSPA that will help us achieve the goal of staying below the 1.5 degree mark that scientists have said we need in order to avoid catastrophic climate change. In order to get there, Nova Scotia needs a 50 per cent reduction in greenhouse gas emissions below 1990 levels by 2030. It's very achievable and we are well on our way.

Today, I want to talk about some goals that we've been talking about and actions that can get us to this 50 per cent below 1990 levels by 2030. We've been working with Gardner Pinfold Consulting on a cost-benefit analysis about what the costs of these actions would be. What would the jobs be? What kinds of jobs would be created and how many greenhouse gas emissions would be saved? What are the GDP benefits? What would the increases be in provincial tax collections?

The first goal is supplying 90 per cent of Nova Scotia's electricity needs with renewables by 2030. This is achievable and, as was just discussed, we could be almost at 50 per cent renewables by 2020.

I want to also say that we are still in the midst of crunching these numbers, so these are preliminary. We're near our final draft, but we have estimated - or our consultant has - that we might create over 44,000 jobs by making sure that we reach 90 per cent renewables by the year 2030.

[1:30 p.m.]

We would also like to see 100 per cent of social housing owned by Housing Nova Scotia - specifically looking at the multi-unit residential buildings of 10 units or more - to be net zero energy ready by the year 2030. This would create 980 jobs. These are jobs from contractors to painters to engineers.

One of the really great outcomes of this goal is that it would help jump-start the retrofit industry in Nova Scotia, because retrofitting housing to be low carbon has huge potential for job growth and job creation, but will also dramatically reduce the greenhouse gas emissions of Nova Scotia. Here in Halifax, buildings are responsible for 50 per cent of our greenhouse gas emissions.

Ramping up electricity efficiency to 3 per cent a year is very feasible and very doable with Efficiency Nova Scotia. Right now, we're at 1.1 per cent efficiency a year, and best-in-class standards are 2.5 to 3 per cent. So Dunsky Energy Consulting has done an economic impact study of what this level of investment would mean for Nova Scotia, and they estimate that between now and 2030, we would create 21,700 jobs.

Actually, the electricity efficiency goal falls under the 90 per cent renewables goal because by investing in energy efficiency to 2 per cent a year, that would mean that we could avoid building a natural gas plant and we could shut down our coal units earlier. This is from models that have been presented to the Utility and Review Board through the Integrated Resource Plan for Nova Scotia Power.

Finally, investment in sustainable transportation would also help us reach this goal of 50 per cent below 1990 levels by 2030. We mean electric vehicles, plug-in hybrid vehicles, and electric buses. This has a huge job potential - 103,000 jobs created.

In summary, we have found some really exciting numbers for the cost-benefit analysis of these goals. We would see 185,000 jobs created by 2030. We're talking about person years when we talk about jobs here. That's about 15,000 jobs per year. GDP would be improved by \$10.2 billion. Provincial tax revenue would increase by \$900 million and we would actually stay in line with the target that scientists have given to us: to stay below 1.5 degrees Celsius. I'm looking forward to questions.

THE CHAIR: There will be questions. Thank you all for your presentation. We'll start our questioning with the PC caucus - Mr. Dunn.

HON. PAT DUNN: Thank you for your presentations. I guess maybe a flashback - back in 2007 with the Environmental Goals and Sustainable Prosperity Act, I was a member of the government at that time when the Honourable Mark Parent introduced legislation. One thing I remember is all the excitement that was around that particular piece of legislation.

Moving forward since that time and recently, so many people that you're talking to and you're involved with are very vague with regard to a definition of the green economy. I believe the Greener Economy Strategy of 2014 sort of hovered over that and didn't really define it and sort of got back to it.

On the weekend, for example, I was on a lobster boat for several hours - a 42-foot lobster boat and maybe another 18 boats in the vicinity - and I'm asking myself if that's a green job with the diesel engines and so on. It doesn't seem to be really clear maybe to the masses what the green economy means. I'm certainly in favour of a green economy.

I guess my two questions would be: Trying to clarify exactly what a green job is, and who decides if it's a green job; and who has the ability or authority with that particular job? Mr. Miller, you mentioned Tesla, for example. If you're working in a plant building Tesla, is that a green job?

THE CHAIR: We'll ask the deputy minister to respond and then maybe others have answers.

BERNIE MILLER: I appreciate the question; it's a good one. Our approach within policy-making is to make sustainability a cross-cutter foundational question for a lot of the economy. Nova Scotia is currently a small mixed economy and there are what people would put the label on as traditional industries and emerging industries. Our general approach is to try to avoid labelling too much. People might automatically put certain of our sectors in a traditional context, but they're going to be around for a long time and

they're going to have a positive impact on the economy and they're going to create opportunities throughout Nova Scotia. Fishing is a good example.

Your reference to lobster fishing and the use of diesel, I think, is a good illustration. Nova Scotia, along with our sister Atlantic Provinces, were selected by the federal government to be Canada's Ocean Supercluster. Part of the ambition of that effort is to consider what the future needs of the ocean economy will be and to zero in on things like fishing vessels that create a great innovation opportunity.

I know through some of the incubators - Ignite Labs in Yarmouth and Creative Destruction Lab at Dalhousie - people are turning their minds to how you create the next generation of fishing boats. In the motor vehicles you see the rise of the electronic vehicle; well, who's thinking about the rise of the electronic lobster fishing boat and what technology is needed in order to reduce the greenhouse impact of some of our traditional industries?

I, too, struggle with trying to label things too closely - green job/non-green job. Our approach would be looking at the economic evolution of Nova Scotia and if we're making the decisions that will support sustainability.

The technology development of new ideas to operate in the fishing industry, which would be considered to be traditional - and maybe right now people might not call them green jobs. But because of the opportunity to evolve our traditional sectors in such a way as they can be sustainable over the long term, it's creating employment opportunities, economic opportunities. At the end of the day, as long as it's sustainable, what value is there in putting a specific label on the job?

I think it's important, I suppose, from one point of view to track and measure as EGSPA does, but I think it may be a little bit of a challenge, given the evolution of the economy and where Nova Scotia is in its economic development to try to pigeonhole green jobs too much from the mainstream of the economy.

I don't know if that was helpful, but it is a challenge to put a label on it job by job without - I guess our answer would be, if we start with the question of whether our policy and program initiatives are supporting sustainability over the long term, then by definition, I guess that could be called a green job.

THE CHAIR: Did you have your second question answered with that - who has the authority or the ability?

PAT DUNN: I think he covered it.

THE CHAIR: Okay, great. We'll go on to Ms. Chender for the NDP caucus.

CLAUDIA CHENDER: Thanks for those presentations. One of the opportunities that we've been taught that you all pointed to and that certainly we've been looking at in the NDP caucus, what investment in the green economy presents, is a lot of the job creation we're talking about is actually rural job creation. We know that there's a need for that.

Our economy is doing pretty well. We can argue about why, but certainly one of the reasons is we have a recovering U.S. economy. We have a recovering Canadian economy. We also know that most of the benefit that we see and discuss has gone to the Halifax region. With our numbers, when you exclude Halifax, there are actually 9,000 fewer jobs in Nova Scotia than there were five or six years ago. HRM is thriving but the rural areas, with certain great exceptions, not so much.

I'm wondering, Deputy Miller, if the department is doing any work to coordinate, not just with your Crown corporations - because the department doesn't have a specific home now for rural economic development, at least that we can see from here. But the Department of Energy, LAE - are you guys talking together about what this shift to a carbon-free economy looks like and helping each other get there?

BERNIE MILLER: First, on the premise of the question that the growth is restricted to Halifax, that's not what the data is telling us when we look at things like population growth. There are definitely areas where the rate of growth is not the same rate as Halifax, but 10 of 18 counties are experiencing population growth.

Often at the working age level, people are choosing to go to communities because there are opportunities there - not enough, more work to do. We're very alert to the fact that the province has distinct comparative advantages depending on what part of the province you're in. The Valley and Colchester County have tremendous opportunities in agriculture and agri-food opportunities, so we work closely with the Department of Agriculture to make sure that policy and program initiatives being developed will support that; likewise, with the fisheries.

Just to give an example, some of the technology-driven entrepreneurship that's happening in Nova Scotia is almost by definition rural. There is a company that's called SkySquirrel - that was their incorporated name, they recently merged and became VineView. Their technology is drones that can monitor the health of vineyards. They are definitely kind of an emerging business. Their office is outside of the core of Halifax, but they have an office in Bordeaux, France, and in Napa as well, serving the wine industry.

There's more that we can and should do on that. We should recognize that we have regions with distinct specialties. Develop Nova Scotia, as you know, now has a province-wide mandate. They're about the infrastructure for economic growth. Phase I is broadband around the province, which is progressing - never fast enough, but a good plan that is being implemented.

The next phase of that is, how do you benefit from having your entire province connected to the global economy through broadband? In some cases, it's developing incubators and accelerators for new types of innovative ideas; in some cases, it's to serve existing industries. Agriculture with broadband actually creates huge opportunities because you can be much more efficient in your operation if you can have monitoring that's reporting back through broadband, and you've got systems that are managing your use of pesticides and fertilizers in an effective way.

It's early days, but I think it's really important for us as we think of innovation-driven entrepreneurship, to come at it from the point of view that each functional economic region of the province has some core capabilities that should be supported. It's great to see Halifax doing well, but it's not to the detriment of other parts of the province. I think that some of the methodology used to drive innovation-driven entrepreneurship in HRM can be equally deployed in Nova Scotia.

We've got a huge advantage with our universities and our community colleges. We've got 13 community colleges around the province and we've got 10 per cent of Canada's universities in Nova Scotia. In a knowledge-driven economy, that's a huge advantage if it's done well.

[1:45 p.m.]

Within the department, we would see Nova Scotia Business Inc. as being primarily focused on driving export growth, and our exports today are fisheries, agriculture, forestry products, output of mining, tires - and those are all driving rural economic opportunities. Develop Nova Scotia has that province-wide mandate. Innovacorp is find, fund, and foster high-growth start-ups - whether it's VineView, which serves the wine industry, or TruLeaf, which has developed vertical farming and is based out of Perennia in Truro.

It's an unfortunate narrative if people think that the only opportunities are Halifax, because I don't think it actually reflects where the opportunities really lie.

CLAUDIA CHENDER: There's so much of that I'd love to discuss, but I'm going to try to stay focused.

I think one of the challenges is - while you correctly identify NSBI's export focus, a lot of that incorporates what we're talking about as potentially green industries or existing green industries, but again, it's that export focus.

I'm hopeful that as Develop Nova Scotia becomes itself, it will have this rural economic development mandate. But I'm also disappointed because we've been advocating from the beginning that the very installation of rural broadband is actually an economic development opportunity in rural areas, and it's our opinion that it's a missed opportunity because there hasn't been enough of a robust opportunity to partner with

municipalities and for government to step in. But again, you have pointed to the limited government role that you see here and so that's just a difference of opinion.

To go back to this job creation question, when we look at the tax subsidies that come out of the department - particularly NSBI - the \$22 million in payroll rebates in 2018 were mostly to Halifax and Dartmouth. So again, understanding that we're sort of coming at it from different sides, given the department's stated desire for a limited role in government, with that \$22 million - I understand the department looks at that as the cost of doing business and bringing these people here, but has there been any analysis to show that's the best use of that money versus investing in job creation - specifically, in green industries, in renewables and retrofits and that kind of thing in broadband and anything else? Is that analysis at play?

Just to go back to my original question, which was: Is there concerted collaboration between departments at your level around this question?

BERNIE MILLER: On the question of investment, as we get the accountability reports in from Crowns and as we do our work, we're constantly evolving the strategy to meet the future needs.

On your specific question, we're very alert to the fact that the economy is strong in Halifax. The government role is promoting research, promoting connection between educational institutions and commercial opportunities, and it presents a great opportunity to evolve our approach.

There is a fund that is managed through NSBI called the strategic initiatives fund, and that's what funds payroll rebates annually. It's always an important discussion for the Department of Business - are we using our policy and program initiatives as effectively as we can? That's an ongoing process of approaching policy and program review on a regular basis, because needs change as times change.

On the question of the tools, and sometimes different tools for different parts of the province, a lot of the export-oriented tools of NSBI would be disproportionately rural compared to Halifax, which may have less direct export of goods - some services export. In the big picture, we're looking at it to try to make sure our strategy is reaching the whole province.

On the start-up world - find, fund, and foster - just to use an illustration, Innovacorp runs a Spark Innovation Challenge competition. What they do is look at four distinct areas of the province and try to draw entrepreneurs into their pipeline. Their ethos is, we want to fund world-leading ideas, and we're geographic agnostic, if I can use that term. If you have a world-leading idea - WoodsCamp was one in Lunenburg County - they're eligible for funding and support through venture capital programs. I mentioned VineView and TruLeaf. It's not that money goes everywhere equally - it's where the best ideas are.

The urban areas, as the evidence shows, does not have a monopoly on good ideas. A lot of our best ideas are coming from rural areas and connected to traditional opportunities. Ignite Labs in Yarmouth is looking at the ways in which fishing traps are designed and how they can be more ecologically effective. There's some work under way to identify how to do rope-less lobster fishing because of the risk of negative environmental externalities from whales and others being caught up in fishing gear. We encourage that.

We want to drive an economic strategy that speaks to the whole province and there's more work to do. As you say, Develop Nova Scotia is fairly new. It started in July of last year. As far as their strategy, broadband is where they're focusing attention immediately, but I think the next phase of that is how you create policy that enhances the opportunities around the region.

The one final point is that tourism is another key area of focus. I think sustainability and tourism often overlap and go hand in hand. Done right, tourism is a very sustainable opportunity. Tourism Nova Scotia, in their programming, is working on the entire province and trying to drive that metric as well.

THE CHAIR: We'll move over to the Liberal caucus. Ms. DiCostanzo.

RAFAH DICOSTANZO: My interest is actually in solar. I was very happy to hear about the home program that you have. We purchased our house 16 years ago, and at the time, we were struggling. It was electric power, and we had moved from forced air oil to this. I'm trying to compare and see where this technology has reached for the individual consumer. That's what's really important. That's what will sell your product. How can we promote it?

I know that a neighbour of mine had put solar on a new house 15 or 16 years ago. I thought, wow, that is really the way to go. We looked at it at that time, in 2003 or 2004, and it was very expensive to install solar, so it was prohibiting. We stayed with electricity at the time because to refit it into forced air and oil was \$20,000, to refit our house. We calculated it over 20 years, and it wasn't worth it. However, now that we have stayed with it, there's the heat pump. Every 10 years, we're confused about what is really the most efficient.

How can you compare solar power to heat pumps right now, and how would a consumer look at it as a viable option? Are we going to look back in 10 years, just like with other products, and say, there's something else that's more efficient? Where are we with solar in comparison to all the other products that are on the market?

LYLE GOLDBERG: I think there are a lot of factors to decide if you're going to go solar. Solar's not going anywhere, and the technology is changing daily. The projections are that by 2050, 27 per cent of the world will be solar, so it's growing. If you're running a heat pump or electric heat, solar is going to be a much greater benefit for you than if you're oil based. There are a lot of factors to consider.

I'm going through the SolarHomes program, and my house is the average kilowatt system in the program - I'm getting a nine-kilowatt system. After the rebate, I'm getting \$8,500 back in rebates, so it's going to be about \$16,000.

There are a couple of different financing options to pay that over 10 years. Halifax Solar City is a wonderful model, which is what I'm using. Credit Union Atlantic is another model on the private sector side.

One of the issues we have heard is that the Halifax Solar City model is not available across the province. They're called PACE programs: Property Assessed Clean Energy. Some municipalities outside of Halifax have a model, but it's not as good. They don't loan out as much money. Most of them are \$10,000 loans, which is not going to cover a solar system.

One of the things we're looking at is working with Efficiency Nova Scotia, Energy, and some other stakeholders on developing a good PACE program that will help fund solar if you live outside of Halifax.

THE CHAIR: Ms. Norton.

EMMA NORTON: I would add in reference to your question about heat pumps versus solar - before I started working on policy, I was on the ground doing energy management plans for homes and non-profits. In general, when you're looking at improving the sustainability of a building, you start with conservation first and then you move to generation, so solar would be the last thing you would do.

You would install a heat pump before you install solar so that the solar system you build could be smaller. It's a more efficient and cost-effective way of doing things, because if you install a solar system with electric baseboards, they'll be using about three times as much electricity as your heat pump would be. I would say that if you're looking at greening a building, one of the things you can do is to look to Efficiency Nova Scotia. They have programs so you can reduce before adding solar.

In addition to what Lyle was saying about the PACE program here in Halifax, throughout Nova Scotia, we're actually leading in Canada for this financing program because it helps people to invest in greening their homes. It would be nice to see it extended to solar, just like Lyle said.

RAFAH DICOSTANZO: What I'm understanding is, we can keep what we have and add solar to help reduce the amount of energy that the other system is using - the heat pump. Also, we know what is efficient - when we see all the new buildings, what type of energy they're going for because everybody wants to reduce the amount of energy and the cost. Is solar going to be the next thing that's going in apartment buildings? How is that going to work?

LYLE GOLDBERG: What's interesting is there was an article today that they did a survey in the U.S. and 70 per cent of the respondents agreed that all new houses should have mandatory solar, which would actually mean you'd have to design subdivisions in a way where the roofs are facing south, ideally. That's not here yet.

The next phase for us is to look on the commercial/industrial/institutional side for solar in Nova Scotia. We haven't done much yet. In fairness to the province, they kind of wanted to start slow and said, let's introduce a SolarHomes program. Now we're starting to see solar on residential roofs and the neighbour looks at that and says, I want it. That's the best form of advertising really. We do have some commercial buildings. The IKEA building is one that people go on a tour in Burnside to see because it has a lot of solar.

One of the issues we have in Nova Scotia - this is getting technical, and I'm not an engineer - we have what's called a 100-kilowatt net metering cap in place. It's legislation. It limits the amount of solar that a commercial building can put on their roof. This is a big problem for commercial developers, so we have formed a committee to look at working with Nova Scotia Power and the province, because it is provincial legislation.

It used to be that you could do a megawatt of power on your roof up to 2015 and then they changed it to 100 kilowatts. This is not new. Other jurisdictions across Canada have caps in place, because obviously, the utility is worried about huge revenue losses.

I think what we're saying is that a building should be able to at least put enough solar on the roof to power their own operations. They may not look at putting on tons more so they can generate a ton of extra power that feeds back into the grid, but why not be able to put enough panels on their roof to supply their own electricity? Right now, a lot of them can't do that. That's problematic. We're working on that to try to come up with a solution.

[2:00 p.m.]

EMMA NORTON: I would say in addition to that, it's not feasible for every building just in terms of solar exposure to have solar, but every building can reduce the amount of energy that they use. I would stress again in terms of where buildings are going and apartment buildings as they're being constructed or as they go through their regular maintenance, there should be priority placed on ensuring that there are energy efficiency measures put in place.

If you look at the transition that is going to take place around the world in order to stay below the two-degree mark, the International Energy Agency says that 40 per cent of those emission reductions are going to come from energy efficiency. That's more than is going to come from solar, more than is going to come from wind. I feel like right now it sounds like I'm saying, let's not talk about solar. I love solar, but I would also stress that when we're thinking about the construction of buildings, in addition to thinking about where their electricity is coming from, is making sure that they are using less.

There are homes that are being built now in Nova Scotia that can be heated with one hair dryer, that's how energy efficient they are. Imagine being able to heat your home for \$200 a year. That's the kind of energy efficiency mechanisms and measurements that I'm talking about. It's actually easier to get that kind of energy efficiency in a larger building like an apartment building than it is in a single-residence home. There are some wonderful programs taking place in Nova Scotia right now to make sure that multi-unit buildings like apartments, or like the Housing Nova Scotia buildings I talked about in my presentation, are receiving retrofits to make them that energy efficient.

THE CHAIR: We'll move over to the PC caucus. Ms. Smith McCrossin.

ELIZABETH SMITH-MCCROSSIN: I know you have given a lot of information, but I'm wondering if the Department of Business is doing anything specific for targeting green jobs. Is there any specific money? For example, I know Mr. Goldberg identified that the Department of Energy and Mines is paying his salary. I'm just wondering if the Department of Business has anything specific. I'm also curious that geothermal hasn't been brought up at all yet today, and I'm wondering, have there been any discussions for including that in green jobs planning?

BERNIE MILLER: I can certainly address the first question, and maybe my colleagues in geothermal may have more information than I have. As far as specific programming targeting green jobs, there are no programs under that heading. The strategy of inclusive economic growth founded in sustainability is really intended to mean all of our programming is designed with that as a foundation, so we don't have anything specific on green jobs.

ELIZABETH SMITH-MCCROSSIN: I'm very proud that in Cumberland County, we are leaders in many areas of energy and renewable energy as well with tidal and wind, and we have a huge solar farm coming in the near future. But geothermal is absolutely a possibility as well, I think all around the province, especially with all the coal mines that have now filled with water, and the water temperature is higher. We have a huge potential for energy savings there.

I'm wondering, is the Department of Business working with NSCC on developing any specific green jobs programming or education around the development of green jobs, whether it's for maintenance of solar panels or geothermal? If so, would you consider Cumberland as being the centre? Also, I just want to mention that Mr. Goldberg had said they were looking for a hub for training, and I also would love him to consider Cumberland as well, where we are such leaders in renewable and other sources of energy.

BERNIE MILLER: On the question of partners to collaborate with, NSCC is certainly a critical partner working closely with us to identify what the future needs of the future economy will be. Of the government departments, Labour and Advanced Education and Business have a lot of interaction with NSCC. Given our model of limited enabling and collaboration, we look to partners like NSCC to really be close to the ground and

identify the distinct comparative advantages of each part of the province. Because they're on the ground, they provide really useful information.

As far as geothermal, as you would know from my earlier comment, it's an area where I don't have a lot of background, and within our department, I'm not aware of specific work. The Department of Energy and Mines may have some thoughts on that. You mentioned tidal, which is a great strength of Nova Scotia. Just to illustrate the point, if Nova Scotia has a comparative advantage in geothermal, the methodology would be similar to tidal, where we have the highest tides in the world. That has meant, basically from a development of technology point of view as they say about New York, the same would hold true for tidal energy: if you can make it there, you can make it anywhere as far as the Fundy tides.

There has been a very focused strategy to try to create opportunities not only in producing energy but also in having people who are interested in developing technology come to Cumberland County, Colchester County, and all of our counties where we have high tides, in order to use that technology and develop new opportunities that can be scalable globally.

On geothermal, my knowledge and awareness would be anecdotal. I know Iceland is a global leader in geothermal because of their unique conditions as being a volcanic area. If, in fact, the science held that Nova Scotia has a comparative advantage, we at the department would be very interested in working with our colleagues across government in advancing that advantage.

LYLE GOLDBERG: I did mention this briefly, but I wanted folks to know that Energy and Mines funded NSCC last year to develop an introductory solar installer program. That's been developed. It's a 45-hour course that, once you take that, it basically reflects the criteria to enter the SolarHomes program. That was a gap that Nova Scotia had that's filled by the community college. I think it's a 45-hour course. They have allocated a number of seats just for African Nova Scotian and First Nation communities as well.

I forget how many they're offering this year, but it was highly subscribed, I know that. I think the training is offered in different parts of the province. I know it's offered in Kingstec for sure. That's a good news story.

THE CHAIR: For the NDP caucus - Ms. Chender.

CLAUDIA CHENDER: Following my colleague, Ms. Smith-McCrossin, I just want to push back a little bit about this limited role. With oil and gas development, we know that the province has in the past taken some responsibility around supply chain businesses, skill building, and things like that to maximize the benefit to Nova Scotians from those projects. I'm really interested in similar work around green industries. We have heard today that these are really growing industries: they employ more people, they have fewer emissions. By any measure, these are things we should be chasing.

I'm happy to hear about the NSCC program, but as you pointed out, Mr. Goldberg, in your presentation, there's a need for standardization of that training. Those are all roles that LAE could step in and fill. I would just continue to argue that there is a role for government to clear the pathways for the expansion of this work and these jobs.

I wonder if you could speak to what confidence you have that these businesses that are springing up, exponentially it seems - I think 17 to 50-something installers, from the beginning of the SolarHomes program until now, was quoted in the introduction - have the workers they need, have the materials they need, have the certifications they need so that they have what they need so that Nova Scotians are protected and we can continue to grow.

BERNIE MILLER: I appreciate the opportunity to clarify. When I speak to limited enabling and collaborative, it's really appreciating where you can have the highest impact. I think the question of workforce development is an important one. That's one where obviously government to a great degree - both directly through P-12 and even the early childhood education programming - and then NSCC and also funding of universities, is critical to developing the workforce of the future.

This is an area where I think it is Nova Scotia's time in terms of a knowledge economy. When we look back historically - and I'll just use Saskatchewan as a comparison - we might have looked to Saskatchewan and said, they've got a lot of natural resources relative to us so they have an advantage over us, but when it comes to a knowledge economy, 68 per cent of Nova Scotians have post-secondary education or an apprenticeship certification, which in Canadian terms put us at the very highest end in terms of having an educated workforce.

If you put that in global terms - and this is something because of our humility as Nova Scotians we don't mention enough, but we're in the top 10 per cent globally. Probably of the OECD countries, I think we're fourth or fifth in educational attainment of our workforce. That's a testament to a commitment to education that spans many governments and goes back for quite some time - probably to the founding of some of the post-secondary institutions that are here. We think that the enabling piece is continuing to make the investments strategically in the types of jobs that the future economy will need.

The second piece is the case of government participating where there's a risk that the private sector is not prepared to take on. We talked about tidal - it's a risky business in the highest tides in the world, so I think the Fundy Ocean Research Center is a good example of government getting involved in creating an opportunity to reduce the risk for private sector participants so that they can develop their technology and ultimately commercialize it.

Government, through Innovacorp - and this goes back to 1995 and the formation of Innovacorp - I think it was a very prescient recognition that Nova Scotia needed to be ready for the future economy. Having a public sector-led venture capital fund - they can make investments if just left to the private sector, they might not go. Venture capital is an

example where the fastest return for an investor in the private sector world is information and communication technology - that's booming and that's where a lot of the private money will go. But by creating Innovacorp and then funding Innovacorp green and blue, which is kind of two sectors where Innovacorp goes, they're going where private sector may not go.

In speaking about "limited," it has to also be put in the context of enabling. That would be what I would call a market failure; there's a great opportunity, but the private sector itself is not going to invest in risky technology when there are more attractive ways to get a return. I think we can do that, and we can continue to develop strategies to do that.

When I look at the data and I look at the opportunity, I'm very confident that Nova Scotia is well positioned to take advantage of the opportunity, which did not exist in a purely natural resource-based economy. We just never had the level of resources needed to compete across Canada or globally, but I think Nova Scotia is entering an era over the next 10 to 30 years where with strategic investments, education, infrastructure, and addressing that risk - putting public money where there is risk - is good policy and good strategy.

[2:15 p.m.]

CLAUDIA CHENDER: The Innovacorp piece is helpful; it will be interesting to see what application that has specifically. I think the tidal one is an interesting example, but I would argue that while mining has ecological risks, human risks - actually, it has been a pretty safe bet over the years for investors - yet the government has consistently supported natural resource extraction without that risk piece.

I guess what I'm looking for - and if you don't have an answer right now, hopefully you can come back in six months and have a really good one - is how government is going to support this transition right now, a lot of which is just brass tacks. It's not high risk. It's just making sure that we make these retrofits and these industries the centre of the government agenda in terms of addressing the climate emergency.

THE CHAIR: For the Liberal caucus - Mr. Irving.

KEITH IRVING: Thank you all for your presentations today. I think everyone at this table is committed to working in the best way we can to go forward to make this transition to a green economy.

I guess my first question, maybe for Ms. Norton, is to try to better understand the numbers that you presented here with respect to 185,000 jobs. Right now, within the document that you circulated, there are 437,000 jobs in Canada. The 185,000 jobs that you're suggesting would be created - that's sort of my question - is 40 per cent of the jobs in Nova Scotia right now. What is that statistic based on and is that net new jobs?

You suggested 103,000 jobs in the electric car industry. I was talking to a young mechanic who was thinking about buying a business and he said, well, maybe I'm not going to go that route because electric cars are going to basically eliminate many, many jobs with respect to mechanics because electric cars don't have as many moving parts and they're not going to need as much maintenance, et cetera.

Is that claim of 185,000 jobs based on net? Do you feel that is realistic in a province with 469,000 jobs presently?

EMMA NORTON: I do feel it's realistic. This will be a huge increase in certain industries that are already growing, but energy efficiency, and in particular renewable energy - and I'm not so well-versed in sustainable transportation, to be perfectly honest - but energy efficiency and renewable energy per dollar spent create many more jobs than a lot of the traditional industries that we've talked about today.

The 103,000 jobs in sustainable transportation in particular were not just electric vehicles - it was also increased public transit and hybrid vehicles.

I want to say, too, that these numbers - we're still figuring it out. We're really looking forward to hopefully when this report is complete to be able to present to each of your caucuses the final numbers and final findings. We think there could be some very generative information there and conversations.

KEITH IRVING: I just think it's important as we try to make policy decisions that we consider net gain as opposed to displacing a whole sector of the workforce, needing to retrain them to modern green jobs. I think that's an important element as we make policy decisions. I guess that will lead to my next question.

If I'm understanding what's been presented here today, we can look at green jobs to include teachers and social workers and that sort of broader sector of contributing to society in a sustainable way. I don't know how you exactly define that.

Then there's the whole technology export thing that the Department of Business is working on, that kind of - let's generate the ideas, do the innovations, export those, and make significant economic opportunities for Nova Scotia.

Then there's the third area, which is actually the largest, which is the installation. This gets to Mr. Goldberg's sector of installing technology, energy retrofits. As you say, 40 per cent of energy reaching our greenhouse gas emissions - I think you used 40 per cent - is in retrofits. That's construction workers and then getting into solar installers and all those things. In fact, the current industry, just based on the report you gave, probably 55 per cent to 60 per cent of jobs in Canada are associated with construction.

My question is maybe going back to some of the comments from my colleagues about workforce training, et cetera. I'm wondering, Mr. Miller or Mr. Goldberg, from the solar perspective, we may not have as big a problem creating green jobs, our problem here in Nova Scotia may be filling green jobs. Again, in the short term, we have a labour crunch. Unemployment is the lowest it has ever been. When you look at the report that you circulated here, 70 per cent in the construction industry across Canada are having difficulty finding workers to work in energy efficiency.

My question is on the labour force and actually filling green jobs that are being created somewhat naturally by the environment and by the public's demand for energy efficiency and programs being initiated by this province and many other places and the federal government, et cetera. Do we not have a challenge here, not in creating the jobs but actually filling them? This may go back to needing to focus on NSCC and retraining and advertising to young people about the job opportunities but also for immigration within the province.

Again, the demographics of our province are retiring 1,000 people a month - or turning 65 at least. We have a labour crunch. Mr. Miller, maybe you can speak to that. How is that going to affect our hopes and dreams of having a greener economy?

BERNIE MILLER: I think you put your finger on an important point. Here, the information that the Ecology Action Centre has presented presents great promise, and the challenge on delivering on that promise is precisely what you've said: Will we have the people needed in order to maximize the opportunities that are in front of Nova Scotians? There's an old expression that I have used in the past that generals are often fighting the last war, and the last war was high levels of unemployment as we transitioned out of an industrial economy. Our constraint is people right now for the opportunities that will present themselves in Nova Scotia now and in the future. That's constraint number one.

Constraint number two is inclusion, making the most of the workforce we have in Nova Scotia. I think education and investments in education starting in early childhood and all the way through and ensuring that traditionally under-represented groups are having access and barriers removed that have historically existed, and public policy playing a role in that, is one way of resolving that. The second is, you used the number 469,000 - that's the size of our current workforce, which has actually been growing over the last several years. We as a province need to double down on how we retain youth and how we attract more immigration. It's not going to be absence of employment opportunities. It's going to be the absence of people to meet the employment opportunities.

We're at a privileged time in history where we can position Nova Scotia for high-value, high-quality jobs. Whereas if you go back in time in a natural resources, industrial-driven economy, Nova Scotia didn't have the comparative advantages to lead in manufacturing. We tried - Clairtone, the heavy water plant, et cetera - but we were distant from markets, and we didn't have the size of workforce. It wasn't a time when it was a

knowledge-driven economy. Abundant, low-cost labour was the driver then. Today, the driver is going to be knowledge, adaptability, and capabilities.

I think investments over many years in post-secondary and the current investments in early childhood education positions the province for the long term quite well for a knowledge-based economy, but our constraint - if we add up all those numbers of person years of employment, it really does speak to the need to not create jobs, but attract people for the jobs that we're going to have.

LYLE GOLDBERG: I think when you introduce a new technology, you can't expect the industry to be up and running and fully knowledgeable, and that's what we're dealing with now with solar. We dealt with that 10 years ago with heat pumps.

I was the first one in my subdivision to get a ducted heat pump system 10 years ago. The guy that would show up one day to fix it didn't know anything, and the next guy was quite knowledgeable. I think that's come a long way right now. When Nova Scotia Power has programs for heat pumps, they list installers on that that are very knowledgeable.

We're going to go through that a little bit with solar. All it takes is one bad install and then word spreads and no one wants to do solar. I think it's really important that we provide the necessary training and figure it out - not just the NSCC program, but looking at some standards across the country. We may not call it certification, but we need some standards.

I think the interesting thing about the solar industry is that some guys built houses for a living and got into solar. If you're a good roofer, that's a nice transition to be a solar installer. If you're an electrician, you need to have an electrician to do the final wiring hook-up. It's not a one-size-fits-all occupation, it's very different. But I think there are some opportunities and we're working with local groups now to try to figure out what the training would be, and I think there are a lot of different skill sets in Nova Scotia that could easily enter the solar industry with the right training provided.

EMMA NORTON: I would like to say in terms of net job impacts, I don't think I properly understood the question before, but I would be happy to get back to you once I clarify whether this is net.

I will say, the energy efficiency report - the *Less is More* report that has been printed out and given to you - that is net job impacts. The 21,000 jobs that I said were associated with increasing energy efficiency targets in Nova Scotia by 2030, that's net.

I would also say - I think your question is one that I grapple with a lot and I spend most of my time advocating for better training programs and more training programs. In Nova Scotia, for example, one of our best training programs for energy efficiency is in Middleton, and I think they have about 13 people graduate a year.

Also, many of the skills that we're talking about being required for the jobs that we're discussing today already exist. The people that will take those jobs are already working with those skills. Most of them are transferrable. For example, like I said earlier, a green job could be a plumber or a carpenter or a painter, and they'll have more jobs once this happens. But I hear the question that you're asking loud and clear.

I guess I would take this opportunity to stress that we're having a very civil, lovely conversation about a crisis that we're in. We only have 10 years, and if we look at the crisis for what it is in reality, we need to invest in this the same way that we've invested in wars in the past - the way that our country stepped up to the plate, and we put men and women to work, and men and women gave their lives. This time, they wouldn't be going to work giving their lives - they'd be going to work to save our country and the world.

We created many dozens or two dozen or so Crown corporations. We've put all of our resources and buckled down on this, and I think that's the kind of action that we're really discussing today. I would also encourage, as we're talking about green jobs in general - you have heard from the uranium mining industry and the hydraulic fracturing industry - there are so many industries in green jobs. I should be here talking only about energy efficiency. That should be the topic today. Lyle should be here, and there should be an entire conversation about solar. Someone else should be in here talking about just geothermal. There's so much to dig into in each of these and specifically how that training is going to happen and what's around. It's really hard to narrow down some good outcomes when the topic of green jobs is just so, so broad.

[2:30 p.m.]

THE CHAIR: We'll move over to the PC caucus. I'm thinking one question, please, for this round. Mr. Dunn.

PAT DUNN: As the province attempts to move towards a green economy, I'm thinking of the traditional industries. Are there any policies and programs in place to help retrain and retool, and help these industries that maybe would prefer not to be involved in it but have to be - they're just on the wrong side of the progress we have made?

BERNIE MILLER: There's a good lesson from the past about not being able to transition economies effectively, and that has led to dislocation. Yes, there is not only a policy mindset but an approach that ensures that we recognize that we're a mixed economy that is in a period of transition. As was mentioned by my colleague, things like carbon reduction can't wait. That needs to happen across many, many sectors. By having an inclusive economic growth policy that speaks to the whole province, what we're trying to make sure of, from a policy point of view at the Department of Business, is that our framework includes low-carbon, resource-efficient, socially-inclusive policies. People often put the label traditional industries are getting left behind. We need to develop very specific policies to help them adapt.

We do sometimes run the risk of mislabelling some of our key comparative advantages. Fisheries and agriculture, when you look at a population of potentially nine billion people within the next 10 years, the demand for protein and the demand for food will be exponential. For a small economy like Nova Scotia, that presents a tremendous opportunity. If our traditional industries are evolving, they have a huge market opportunity in front of them. We in the Department of Business, together with colleagues in other departments and Nova Scotia Business Inc., are developing programs to try to help encourage that adaptation with a view of ensuring that sectors that might not yet feel part of an evolving economy are still very closely connected to it.

EMMA NORTON: Last year the Just Transition Task Force toured across Canada to talk to communities that are relying on coal currently, and they wrote a report about how to help those communities transition away from carbon and the kinds of policies that would be needed. Of course, it was incredibly relevant in Nova Scotia. They had three town halls here. I think it would be very interesting to take a look at the policies that are recommended in there in terms of talking about transitioning the workers.

THE CHAIR: We'll move on to the NDP caucus. Ms. Roberts.

LISA ROBERTS: Apologies to the committee and to the witnesses. I had this committee in my calendar for 2:00 p.m., so apologies for being late. Ms. Norton in particular - more so when I've been in the Legislature than in this committee, when Nova Scotia's progress to date around greenhouse gas emissions is talked about, it's often framed as: we have already done so much and Nova Scotians can be proud, and future work is sometimes framed as being a matter of sacrifice. Of course, Nova Scotians do pay some of the highest electricity rates in the country, and we do also have high rates of energy poverty. We don't want to see that get worse.

Can you talk to me about the impact of investing in renewables but also efficiency? Have we got the framing wrong? Is this just a matter of having to sacrifice, or could this actually be investment with opportunity that makes people's lives easier and creates a more resilient community for us, if we do commit to going down that path and sooner rather than later, more aggressively rather than the way we have been going for the last while?

EMMA NORTON: I love that question. I would start by saying that yes, we have done a lot. I would echo what Deputy Minister Miller had said about we're not very good at recognizing things that we have done well. I think if we could look at all the things we have done so well and there could be more personalized stories about it, we would have more confidence in our ability to dig deeper and to do even better.

Currently, by 2030, we will not achieve the greenhouse gas emission reductions that we need. I would say that in terms of affordability of energy and energy poverty in Nova Scotia, it is a very significant issue. We can look to Bridgewater - has everyone here heard about the great work that Bridgewater is doing to tackle energy poverty? They're investing in renewable energy and energy efficiency, and they just won \$5 million from

the Smart Cities Challenge to reduce energy poverty in their community by 20 per cent by the year 2025. That's by investing in this transition to a low-carbon future.

Energy poverty is defined as spending more than 10 per cent of your income on energy for your home and also for transportation. Yes, we have some of the highest electricity rates in Canada here in this province. That often defines the conversation that we have about the investments that we make, be they in renewable energy or energy efficiency. Time and time again, my colleagues and I are in the weeds with the Utility and Review Board, looking at the modelling that is being done for whether we should invest in renewables, whether we should invest in energy efficiency. By investing in renewables and energy efficiency, we can have more affordable electricity in this province.

Just last year, the Generation Utilization and Optimization report - which is a mouthful - said that we should be shooting for higher levels of energy efficiency, in the 2 per cent range. That might sound like jargon if you're not already in the energy efficiency world, but when we are hitting 1 per cent, and I'm saying we should aim for 3 per cent, it would actually be more cost effective than our business' usual trajectory that Nova Scotia Power has planned until 2030. I believe I mentioned this earlier: by investing in energy efficiency, we would be able to shut down a coal plant earlier and we would be able to avoid building a natural gas plant.

Also, when you look at energy efficiency investments for a community, if you have quite high rates for your electricity but you're using less, your bills can be lower; you need to look at the total bill. Germany is an excellent example. Their electricity rates are at least twice as high as ours, but their bills are lower because everything is so energy efficient.

I'm specifically tackling this idea right now of energy affordability. This can be an affordable transition for us. It will be an affordable transition for us, and it's an investment in our future and creating a more sustainable, better province to live in.

LYLE GOLDBERG: That's one of the things we're struggling with now: low-income solar. Right now, you need to be a homeowner to take advantage of the SolarHomes program, but what about low-income people in apartments, social housing, and things like that? I think that's kind of the next phase. I know the Department of Energy and Mines, as well, has an interest in low-income solar and what that might look like. In order for that to happen, there will have to be some policy changes at the utility level.

There are examples in the U.S., like solar gardens where there is a large utility scale. A renter could lease, for example, a few panels to help offset their electricity costs. There are different models out there that the department is exploring. I'm excited about that to happen. Hopefully that will be on the table over the next while.

THE CHAIR: I know in Bridgewater with their program, they found people who live in mobile home parks, who don't own their property, but they own their trailer, so they can't participate in this program.

LYLE GOLDBERG: People on reserves in Nova Scotia - a lot of them don't own the home, but they pay the power bill and they can't participate in the SolarHomes program, so that's problematic as well.

THE CHAIR: Regulations. We'll move over to the Liberal caucus - Mr. MacKay.

HUGH MACKAY: Thank you, witnesses, for your very informative presentations today. Deputy Miller, I've heard you on numerous occasions speaking of things on the direction of the Department of Business. One of them is that a successful economy is planted rather than transplanted. That has rung well with me and I'm just wondering if you can go a little deeper into that for us, because I'd like to hear your thoughts on that.

BERNIE MILLER: I guess the underlying principle embedded in that statement is, the best place to start your thoughts around economic growth is, what are your natural comparative advantages? What does your jurisdiction present that you can be a leader in? What does your workforce have capabilities to do? What have they historically been strong on? It's not to say there's not a place for foreign investment. I think a component of driving growth is attracting industry to the province.

I was a bit of a student of history and since I've been in this role, economic history. When I look back in time, for many years, Nova Scotia's strategy seemed to be to try to attract ready-made industry from outside the jurisdiction to come to the jurisdiction. We had some significant successes in some cases, but at the same time, some significant failures.

Nova Scotia wasn't the only one. When Newfoundland joined Confederation, Joey Smallwood kind of set them on a path. He curiously turned his back on the fishery and shipbuilding, and he tried to develop industries that weren't conducive to their conditions: glove making, gypsum board, boot making - a whole range of industries. New Brunswick did the same thing with Bricklin, if people remember that.

The message embedded in that phrase is, start with your strengths. For Nova Scotia, agri-food in very niche areas: blueberries, the wine industry, our domestic market in terms of many of the things that we can consume domestically or have Canadian exports in. The ocean presents an inevitably renewable comparative advantage if we approach it correctly.

A strong economy being planted, not transplanted, is recognizing that when Nova Scotia was thriving - when our economy was strong, it was often because we recognized that Nova Scotia had this unique comparative advantage. Yarmouth at one point was the global leader, or at least in North America - it had the highest amount of registered tonnage of shipping in all of North America, so it far surpassed the U.S.

A strong economy planted not transplanted - step one is, what is your comparative advantage, and then build from the comparative advantages. If that also involves attracting to your jurisdiction industries that are aligned with your comparative advantage, that's a good outcome. But if the economic development strategy is simply to attract industry from outside of Nova Scotia, I think that has some significant gaps. That's really what underlies that.

THE CHAIR: Thank you for participating in today's meeting. Mr. Miller, do you have any closing remarks?

[2:45 p.m.]

BERNIE MILLER: I just want to thank all of the members for the questions and the opportunity to participate.

THE CHAIR: Ms. Norton, do you have any final remarks?

EMMA NORTON: I just wanted to say thank you again. I forgot to acknowledge at the beginning that we are meeting on unceded and unsurrendered Mi'kmaw territory.

I would also say that I really look forward, if you'll have us, to presenting to your caucuses our final cost-benefit analysis of our goals.

THE CHAIR: Mr. Goldberg, do you have any remaining remarks?

LYLE GOLDBERG: I just want to thank the committee for giving me the opportunity to speak on solar. We're very excited about it and what the future holds. We did have the opportunity to speak to the NDP and PC caucuses. I'm still trying to get a date with the Liberal caucus, so maybe, Keith, I can talk to you later about that. I would like to get in front of you guys. Thank you very much.

THE CHAIR: You're welcome. You may be excused. We just have a little bit of committee business.

We will move on to committee business. We have received a referral letter from the Chair of the PAC, Mr. Orrell, about taking the Department of Transportation and Infrastructure Renewal and the Department of Communities, Culture and Heritage with regard to the Nova Scotia Art Gallery project, to bring forward at a meeting of our committee.

I'm suggesting that we put it on our next agenda-setting meeting in the Fall. We have no more meetings for the summer, so at our next agenda-setting meeting, we will consider it.

Is there agreement? Okay.

Our next meeting will be September 24th, and that's depending on the House session.

With that information, I think that concludes all our business. Enjoy your summer. I adjourn this meeting.

[The meeting adjourned at 2:47 p.m.]