



PEI Energy Blueprint Discussion Paper

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Introduction

Why are we having this discussion?

Prince Edward Island needs a strategy, plans and actions to achieve a clean, affordable and accountable energy future. Our Province's last energy strategy was developed in the mid-2010s. It had many objectives we still share today. It focused on reducing the amount of energy we use. It made short-term commitments for new electricity management and generation. It set a direction for efficiency and using electricity rather than fossil fuels for transportation. It also committed the government to lead by example in the provincial government sector including the use of biomass in Government Buildings.

Six years later though, circumstances have changed. Our population and peak electricity use are growing faster than expected. Last year we had the strongest population growth in Canada – 4.25% from January 1, 2022, to January 1, 2023.ⁱ In recent times, our peak electrical usage is exceeding previous forecasts: 2022 saw the peak hit 320 megawatts (MW) much greater than Maritime Electric's forecast of 283 MWⁱⁱ, and 2016/17 Energy Strategy forecast for 2022 of 294 MW. In February 2023, our peak electricity demand hit 393 MW, again exceeding peak forecasts for this period.

Another factor driving demand for electricity is the drive for energy savings. More efficient than oil furnaces, we are seeing major growth in heat pumps. This growth is also supported by a PEI Government policy to offer free heat pumps for households with net income of \$75,000 a year and offering rebates for everyone.

Although not a major factor yet, we expect new growth from electric vehicles (EVs). Government's Net Zero Framework has ambitious goals for adoption. EVs are rapidly becoming more accessible with an emerging variety of model options, attractive prices, longer-range batteries, and new features. These new features include Battery to Grid (BtG) technologies that use the vehicle battery to support resiliency in your home or could enable you to sell electricity to the Island grid. All these new uses for electricity and the related reduction in the use of fossil fuels, will only continue to grow.

Another reason to look at our energy systems today and what should happen in the future is climate change. The pace of change has accelerated: the urgency to act is growing. PEI is now committed to Net Zero by 2040. Much of the planned reduction in Greenhouse Gas (GHG) emissions will come from the energy sector as we move from fossil fuels to clean fuels. To make that transition we need all fuels – from electricity to the sustainable use of biomass, biofuels/renewable natural gas, and hydrogen.

Fortunately, the cost of major elements in this transition is coming down. Supply chain challenges have tempered cost reductions, but as the scale of wind fields becomes larger and their turbines reach higher, the cost is still significantly lower than it was when the last energy strategy was written. The cost of solar photovoltaic (PV) panels has also come down. This is especially true when it is installed in larger community solar arrays. We are also seeing new technologies leave the drawing boards and become major parts of a new energy system. These technologies manage energy systems by shifting demand and storing electricity supplies for use when demand is high. New programs and financing options for energy efficiency have also emerged.

There is also new urgency on resiliency and reliability. Recent severe weather events such as Dorian and Fiona have caused significant impacts in our province. With widespread outages for many days lingering into weeks, questions about faster recoveries and who is responsible for making that happen are top of people's minds.

As a result, of all these matters, we now have policy options to consider and decisions to make. Where should our energy come from? How can we grow local supplies and local economic benefits in a way that has minimal impact on energy affordability? How can we ensure utilities are held accountable, encouraged to advance public policies, and become positive partners in change? Who should build the plans for the entire energy sector, and how should they be held accountable?

These are just a few of the new realities we need to address and choices we need to make as we chart a course for a new green, reliable, affordable, and accountable energy future for PEI.



How will the Energy Strategy be Built?

This Discussion Paper is the first step in opening a conversation with Islanders on our Energy Future. It will be used in our engagement with Islanders and their institutions, businesses, and community organizations. The Discussion Paper asks questions after each section. We ask you to think about them and provide your feedback through our [Blueprint Website](#).

We will also conduct a series of Community Conversations with Islanders to discuss energy issues together. We will hold technical sessions with key stakeholders. Everyone will be able to contribute. We will compile all this feedback into a written report on what we heard. We will reflect further, then we will release an Energy Blueprint for PEI, with operational plans to get to a clean, flexible, accountable island energy system.

The Timetable for Dialogue and Action is as follows:

Spring 2023	Release of Discussion Paper and launch of Consultation Website
Spring 2023	Community Conversations Stakeholder Meetings Technical Sessions
Late Summer 2023	Release of What We Heard Report
Fall 2023	Release of Energy Strategy
Winter 2024	Release of Operational Plans

Context

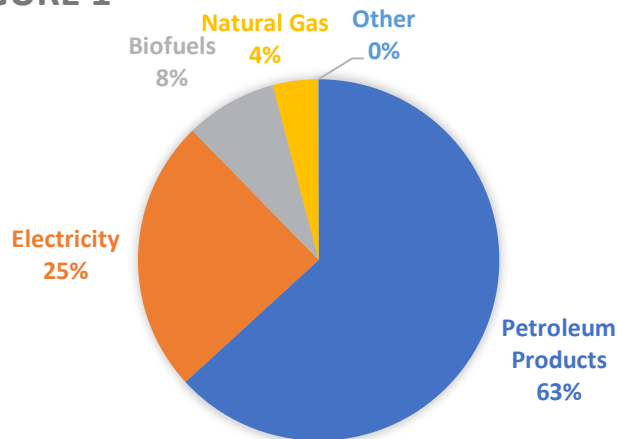
As we think about energy issues, it is useful to first understand where we are today.

Where does our energy come from?

Looking at all the energy we use, a quarter comes from electricity, while the rest is mainly in the form of liquid fuels from petroleum, which includes the fuels in natural gas. Figure 1 shows the breakdown of energy use today.

24.49% Electricity
 63.20% Petroleum Products such as gasoline, diesel, and furnace oil
 8.22% Biofuels (including biomass)
 4.05% Natural Gas
 0.04% other sourcesⁱⁱⁱ

FIGURE 1



PEI Electricity Sector

Table 1: On-island Generating Assets^{iv}

<i>Wind (203.6 MW)</i>		
West Cape	ENGIE	99 MW
Hermanville	PEIEC	30 MW
Eastern Kings	PEIEC	30 MW
Summerside	S'Side Utility	12 MW
North Cape	PEIEC	10.6 MW
WEICan R&D	WEICan	10 MW
Norway	ENGIE	9 MW
Aeolus	PEIEC	3 MW
<i>Solar (31 MW)</i>		
Summerside Solar Energy Farm & Battery Storage Facility 'Sunbank'	S'Side Utility	21 MW
Slemon Park Microgrid Project (Slemon)	PEIEC	10 MW

<i>Thermal Generation (104 MW)</i>		
Borden Generating Station (CT1 & CT2)	MECL	40 MW
Summerside Generating Station	S'Side Utility	15 MW
Charlottetown (CT3)	MECL	49 MW

PEI's generation assets are for the most part wind and a small but increasing amount of solar. These are intermittent sources of energy so when the wind isn't blowing, or the sun isn't shining PEI relies on importing energy. The imported electricity we use comes mainly from New Brunswick. In the case of Maritime Electric, the breakdown is as follows:

Table 2: MECL Electricity Supply in 2021^v	
On-island oil-fired generation	0.10%
On-island wind generation (contracted)	19.40%
Point Lepreau participation	13.67%
System purchases from NB Power	66.83%

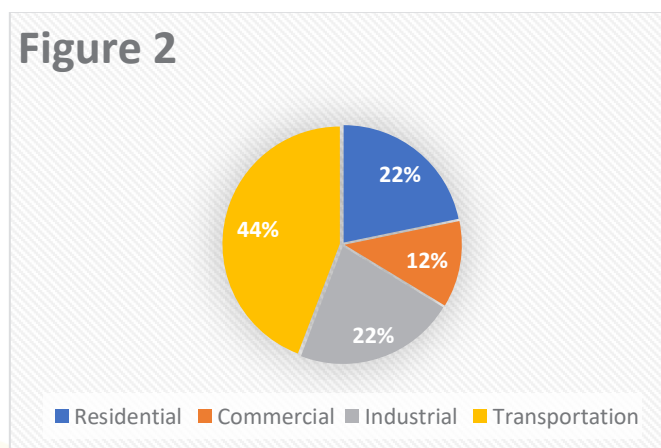
Summerside Electric also operates as a non-regulated utility providing electricity to approximately 7,000 customers. Alongside energy purchased from off-island, approximately 46% of the energy supplied by Summerside Electric is provided by on-island renewable sources.^{vi}

Other Fuels Sector

The rest of the energy we use comes primarily from oil products (63.20%) and biofuels (8.22%) which we use for transportation, and heating. Natural gas (4.05%) is largely used for food processing. The fossil fuels used on the island are imported.

Details of Energy Usage on PEI

The total energy demand of the Island by sector is detailed in Figure 2. ^{vii}



What does this mean for Climate Change?

In 2020 the Island had 1.6 MT of GHG emissions, a 15% reduction from 2005 levels. However, with most of the PEI's energy needs being filled by fossil fuels, especially for the transportation sector, we need to make very significant changes in how we heat our buildings and power our vehicles to meet Net-Zero and climate change commitments.^{viii}



Managing the Change to a Net Zero Energy Future

Principles, and Goals

Building upon the 2016/17 **Energy Strategy Principles**, we are proposing the following language to reflect the realities of the 2020s.

- The energy transformation to Net Zero will be fair, and equitable.
 - We will lower GHG emissions in a carefully planned manner without undue burdens on vulnerable Islanders or their businesses.
- The Island Energy Future will include a diverse and balanced supply of net-zero energy.
 - We will have a new balance of on and off-Island supply from a wide range of energy resources (wind, solar, biofuels including biomass and hydrogen) to reduce risk on prices and security of supplies.
- The energy transformation will take advantage of Island skills, experience, and ambition to build new economic opportunities.
 - We will align our energy policies and actions with opportunities to grow jobs and businesses on the Island consistent with the other two Principles.

We also propose the following language to describe our updated **Energy Strategy Goals**.

- Become Canada's first Net Zero Province.
- Make reducing the amount of energy we use our priority.
- Build energy systems that are Accountable, Reliable and Resilient to climate change.
- Enable Affordable Energy from our Island.
- Capitalize on our Ability to Innovate and be Creative.
- Collaborate with others to Reduce Costs and Accelerate Change.

1. Do you agree or disagree with the words we are using for:

Energy Strategy Principles Yes / No

Energy Strategy Goals Yes / No

Comments:

Key Themes for Energy Strategy

In building a strategy and plans to get there, it is useful to think about matters that can be linked together. These common themes may help us understand why we need to act, or they may group common actions together. In either case, the Themes will be used to organize the Strategy, and we are seeking input on whether the ones outlined below need to be added to or otherwise modified.

Recognize the need for Rapid Action on Climate Change

PEI's 2022 Net Zero Framework calls for urgent action to reduce GHG emissions. Energy represents 62% of our province's GHG emissions. The Framework sets ambitious new targets. The first is just 7 years away in 2030:

PEI is committed to producing no more GHGs from energy use than our land, ocean, and technologies can absorb.^{ix}

Effectively that means our electricity system must remain Net Zero to achieve a 25% reduction in all GHG emissions by 2030. Progress on developing other energy resources (hydrogen, biomass, biofuels) must also be underway. By 2040 the outcomes become more stringent. All sources of GHG emissions are counted. Offsets such as growing new forests or using new technologies to take CO₂ from the air are also included. That means all emissions from energy, agriculture, or other sources such as methane from landfills, less any offsets must add up to zero.

The task of the Energy Blueprint will be to identify the broad steps we will take to meet both the 2030 and 2040 targets from all parts of the energy sector including lights, power, heat, and transportation. Reducing the amount of energy we use will be the first step in the Energy Strategy's operational plans which will have details on the path to net zero. Choosing carbon-free resources for the energy we do use will be the second step.

Completing the switch away from petroleum will result in significant growth in new clean and green (clean is non-emitting, while green is renewable) energy supplies. Even with energy efficiency, it is expected that the electrification of the heating systems in our buildings and the motors for light trucks and cars means our electricity supplies will need to double. How much growth will depend upon the cost and availability of alternatives such as hydrogen, biomass/biofuels. It will also be affected by population growth. From this growth, we would subtract all the results from efficiency improvements.

Managing this new growth will be a very significant challenge. What is not cost-effective today, may well be tomorrow. That's why the Energy Blueprint will recognize the urgency of change, while carefully managing the pace of change. Everything will come in stages.

Infrastructure such as Electric Vehicle (EV) chargers, advanced meters and communication systems, and hydrogen fueling stations will have to be built to ensure these new cleaner resources can be used effectively and to full advantage. Setting flexible goals and carrying out demonstration/development projects to understand costs and benefits while watching how those technologies mature will help avoid unnecessary costs for taxpayers and ratepayers.

Finally, the Energy Blueprint will enable us to use the transformation as an opportunity to introduce new measures for accountability on system planning and performance on outcomes such as reliability.

2. A Net-Zero carbon energy system may produce some greenhouse gas emissions but they are offset by reductions elsewhere. Zero carbon energy sources include hydro, wind, solar, nuclear as well as biomass and gas made from renewable fuels.

In recent times, the price of these forms of energy have been higher for consumers, alongside upfront capital costs for necessary infrastructure, but costs are coming down while fossil fuels are becoming more expensive as the federal government has placed a rising price on carbon.

Knowing this, how committed are you to increasing your use of zero carbon energy for your home, vehicle, and business needs, even if it may cost you more, by 2030? Answer using a 1 to 10 scale where 1 means “not at all committed” and 10 means “very committed”.

3. What would help you increase your use of zero-carbon energy sources?

- ☐ Access to financing/low-cost financing
- ☐ Incentives/rebates/subsidies
- ☐ Information on zero-carbon/net-zero energy sources
- ☐ Cheaper/lower cost of electricity/energy

4. Of the following options to ensure Islanders reach our Goals for Net-Zero, which do you prefer:

- ☐ Set requirements in the law. This includes building codes, fuel standards, and quotas. Such measures tend to be very effective in reaching the goal but may be more challenging for some sectors or some people
- ☐ Use incentives to encourage greener buildings, more electric vehicles etc.

5. If we are to manage the transition fairly and equitably without undue burden on vulnerable people, which if any of the options would you consider fair?

- ☐ A rate design that has a lower cost for a block of electricity equal to that of an average user, but a higher rate for use above average.
- ☐ Taxpayer support for those who face high energy costs but have low incomes.
- ☐ Energy efficiency upgrades reduce the amount of energy used and thus the cost.
- ☐ Other measures? _____

Taking Advantage of Declining Costs, New Technologies, and Rate Designs

Our second proposed theme is about the new opportunities to accelerate the transformation affordably.

Around the world and across Canada, the cost of key renewable energy resources has fallen. A competitive process last summer in the neighbouring province of Nova Scotia, secured 372 MWs of wind for a price of \$53.17 MWh^x. Community solar is being built on our Island for a cost of \$100 to \$120 per MWh^{xi} and the US Department of Energy reports solar+ storage is becoming increasingly common and competitive at \$65/MWh.^{xii}

Meanwhile, natural gas and coal prices are on unpredictable rises and falls. Some of the clean energy prices are facing supply chain challenges and resource constraints which may impact adoption. But the longer-term expectation is that price declines for wind will stabilize, and other clean resources such as solar and storage will continue to fall.

Cost-competitive alternatives to lithium for electricity storage are expected to come into the marketplace later this decade. Batteries that last longer, and don't have to be lightweight should also be more cost-effective at the utility scale. New technologies to store heat will also help us manage a new energy system that will have more energy controls at a building and community level.

Also helping in the transformation will be electricity from off-Island, especially for grid stability and reliability. We have carried out technical modelling which is part of our discussions with Islanders. The modelling shows investments for on island generation provide an important shield against price spikes from off island markets. The analysis also shows the potential for overall lower costs. Details of the modelling will also be available through our Energy Blueprint website. The Energy Blueprint will further evaluate the costs and benefits of both on and off-island electricity resources.

Not all clean energy resources will come from electricity. Opportunities in sustainable biofuels/biomass, especially for heating, and local resources such as landfill gas, agriculture and forest waste are on the horizon. Further, the evolution of Small Modular Nuclear Reactors (SMRs), the economics of green hydrogen and the costs and benefits from offshore wind bare watching. While not the lowest cost today, widespread adoption elsewhere and technology innovation would make them attractive here.

The clean energy transformation will also come from technologies and rate designs that will help us manage energy demand and costs for all. Advanced Meter Infrastructure (AMI) includes smart meters and communication systems that can help shift electricity use away from very expensive peak times. Avoiding competition for electricity at those times will benefit everyone. Summerside Electric has started to pilot smart meter infrastructure and Maritime Electric has plans to move forward with Advanced Metering Infrastructure.

Building-level smart switches can also help avoid peaks, as can storage. Rate designs that reward reduced electricity use will also help reduce the cost of going green. Many jurisdictions are already using these strategies, and PEI can learn from their successes and mistakes.

Storage technologies will be particularly important. They can benefit the owner by providing backup power. They can also benefit the grid and lower costs for everyone. One form of battery system which

could be very important are electric vehicles (EV). Many new EVs are being designed to allow their powerful batteries to provide power to the grid as well as recharge from the grid. Taking advantage of EV growth to reduce emissions and to provide grid management is an exciting development in the energy transformation. It also represents a major challenge to traditional utility operations, energy policy, programs, and legislation.

The outcomes we can expect from these new technologies and programs are:

- The creation of a more competitive environment for energy supplies
- A more diversified portfolio of electricity supplies that should improve reliability and resiliency
- A more distributed energy future with more supplies and control in our homes and communities
- New investments in infrastructure to measure and manage current and new electricity demands with new rate designs to take advantage of the new infrastructure.

6. Do you expect average Electric Vehicles to achieve a range greater than or equal to that of a combustion vehicle on a single tank of gasoline? If so do you think it will happen by

- ☐ 2025
- ☐ 2030 to 2035
- ☐ Not until after 2035

7. Are you in favour of setting requirements for dealers to sell a certain % of zero-emission vehicles each year in PEI? Yes / No

8. One way to increase the amount of renewable electricity generated in PEI is to build solar farms where shares in the farm are owned by people in the community. How likely are you to invest in a community solar operation if the return on your investment was approximately 5 or 6 percent? Answer using a scale from 1 to 10 where 1 means you “definitely would not invest” and 10 means you “definitely would invest”.

9. How important is it that our future energy needs are met from local energy supplies? Answer using a scale of 1-10 where 1 is not at all important where 10 is very important.

10. What source of electricity do you consider most reliable? Is it

- ☐ Electricity generated in PEI;
- ☐ Electricity generated off-Island; or
- ☐ A balance between both

11. In recent years, new technologies to produce and manage electricity have become cost effective. Given that PEI now has less than 12 years to reach its goal of having net-zero energy supplies, how important do you think each of the following actions are for the provincial government. Answer using a 1 to 10 scale, where 1 is not at all important, and 10 is very important.

- Building large wind farms, such as the one located at West Cape, which are currently the lowest cost to produce renewable electricity.
- Building small wind farms, even if they cost more to build.
- Encouraging large community-based solar operations which can produce electricity at a lower cost than residential solar systems.
- Developing new rate designs for energy storage and solar panels, so homeowners can sell electricity to the grid when demand is high.

Accelerating the Adoption of Beneficial Electrification

Our third proposed theme is one that was a foundation of the 2016/17 Energy Strategy, and it remains an important part of the one we need now: we need to use less energy by making our buildings more energy efficient. Since our last strategy, new programs have been introduced and tested. Barriers to adoption are being reduced at the provincial level and in some municipalities. Long-term, low-cost financing has been combined with integrated program support.

To build on this success, over the next several years government programming to support building-level efficiency measures, renewables, storage, and EV charging need to be integrated, targeted, and enhanced. In addition to improving the energy efficiency of our current buildings, a growing population means the next new generation of buildings must be built to very high standards. Pilots to test and deploy new solutions in government-owned buildings was a commitment in our Net Zero Framework.

This means we should see very little heat loss from our next-generation homes, as well as net-zero heating and cooling systems. PEI has adopted the most recent version of Canada's national energy code (2015)^{xiii}. The next version is expected to be released in 2025. The combination of using less energy, lowering GHG emissions, and shifting demand to reduce peak demand to lower costs for all users is referred to as "beneficial electrification".

12. What are the major barriers to making your home or business more energy efficient? [check all that apply]

- ☐ Lack of money
- ☐ Lack of credit to finance the work
- ☐ Lack of knowledge on what to do
- ☐ Lack of knowledge of the benefits of efficiency
- ☐ Lack of accessible labour
- ☐ Program paperwork and administrative requirements
- ☐ Other: _____

13. Would you upgrade the efficiency of your home if there was a program to help you get the work done with no money down and provides low-cost long-term financing that starts to save you money right away? Yes / No

14. Should such a program also include [check all that apply]:

- ☐ Building-based renewables and storage
- ☐ New home-based electric vehicle chargers
- ☐ New net-zero power equipment in boats
- ☐ New efficiency equipment on farm machinery
- ☐ New efficiency measures for businesses

15. Would you sign up for any of the following voluntary programs to save on your electricity bills:

- ☐ A program that manages my hot water supply so it is heated up during off-peak prices while receiving lower prices the rest of the time, with the ability to override it as needed. Yes / No / Maybe
- ☐ A program that saves me on electricity costs during the day and overnights while charging me more for peak periods in the early morning/late afternoon early evening? Yes / No / Maybe

16. Some jurisdictions in Canada have set high energy efficiency standards for new buildings. While this may result in higher construction costs, it is expected that those extra costs would be recovered over time by lower operational costs. To what extent do you oppose or support this idea? Answer using a 1 to 10 scale where 1 means you “completely oppose” and 10 means you “completely support” having higher energy efficiency standards for new buildings in PEI.

17. To promote energy efficiency awareness and encourage efficiency upgrades, should the provincial government require an energy efficiency rating or labelling system be used to rate properties?

If yes, Should the building rating or labelling requirements be mandatory for:

- ☐ All multi-residential rental buildings Yes / No
- ☐ All commercial buildings Yes / No
- ☐ Only on existing buildings when they are sold Yes / No

Supporting a Shift to Sustainable Fuels

Our fourth proposed Theme includes adopting more sustainable fuels. Across the Island and around the world people are changing the way they heat and cool their buildings by installing energy efficient heat pumps. We are seeing the beginning of a huge shift away from oil and over to electricity in the cars and trucks we drive, the boats we fish from and the ships that carry cargo around the world.

A green and clean modernized electricity system will therefore support much of our new heating and cooling needs and our next-generation transportation system for our light-duty cars and trucks. However, there may be need for alternative fuels— especially when it comes to hard-to-electrify heavy-duty long-distant freight movements, marine transport, and aviation.

The most likely alternatives include biofuels (liquid fuels made from biomaterials including food and other compostable waste, wood waste, and sustainable biomass materials such as wood pellets for heating). Waste-to-energy systems are a key part of our Net-Zero Framework. Broadly speaking both PEI's agriculture and forest sector could have an important opportunity to benefit from biomass and biofuels as producers and users of the fuels.

These sectors also remain a focus for cost-effective reductions in the amount of fuel they do use. Using these sources for energy may need to be carefully labeled and regulated to make sure they are sustainable. The Energy Blueprint will develop an operational plan to characterize the opportunity and identify the conditions for the successful development of sustainable fuels.

In the medium to longer term, green hydrogen may also emerge as a significant solution. Russia's invasion of Ukraine, and the resulting disruption of natural gas supplies in Europe has led to a global race to ramp up production and lower costs. The goal is the production of green hydrogen, which is made with renewable electricity, that can later be used directly as a fuel to burn or make green ammonia for fertilizers or in fuel cells to power electric motors. The best use of hydrogen is expected to be for hard-to-electrify industrial processes and heavy-duty transport (long-distance trucking and marine transport). Green hydrogen is expensive today, but the global race for solutions is expected to drive down costs through economies of scale and new technologies to produce it.

To make a successful and rapid transformation to sustainable fuels, the transportation sector needs certainty on when the market will change and by how much. It also needs to know when new cost-competitive zero-carbon fuels such as green hydrogen will be available and at what price.

Certainty can be supported through a roadmap that includes a timetable to build the infrastructure. The roadmap also needs an outline of incentives and costs associated with the transformation. With clear objectives and staged timetables, there will be opportunities for new investment and economic growth on the Island.

18. With the phasing out of oil and gas, liquid fuels may still be very important. They don't have to be made from petroleum, they could be made from renewable resources and become Green Hydrogen, Renewable Natural gas (for example methane captured from landfills) or fuels made from bio-degradable waste (bio-fuels) How important is it that we produce these kinds of fuels from Island resources? Answer using a scale of 1 to 10 where 10 is very important and 1 is not important at all.
19. Do you see forest and agricultural waste (biomass) as being a sustainable source of energy?
Yes / No
20. Should biomass from sustainable resources continue to be/become a significant source of energy for heating on the Island? Yes / No

Driving Innovation and Economic Development

The energy transformation will create new opportunities for energy innovation. The Government of Prince Edward Island is establishing infrastructure to support innovation at our Clean Tech Park^{xiv}. The Park, located in Georgetown, is becoming home to new cleantech companies and the Clean Tech Academy. The Academy will feature graduate pods and incubation space as well as collaborative areas allowing students to connect and learn from industry. There will be researchers working on key priority areas such as EV charging and batteries as well as hydrogen. It will seek new opportunities to partner with research institutions like the UPEI School of Climate Change and Adaptation and the UPEI Sustainable Design Engineering program, to understand the policy and technical solutions to build our Island economy.

We are also building on the strengths of our entrepreneurs. We have been pioneers in the development of wind. The Province's partnership with the Wind Energy Institute of Canada (WEICan) has also been a contributing factor to PEI's innovation in the wind sector. The organization has been operating since the 1980s on PEI and has been at the forefront of testing and demonstrating the feasibility of wind energy in Canada. The existence of a well-established wind testing site on the island can facilitate further innovation of wind and renewables on PEI.^{xv} WEICan now has solar PV and storage as well. Other Island companies are driving innovation to the wind renewables sector such as Frontier Power Systems, located in Georgetown Royalty. The PEI Energy Corporation owns and operates half the Island's wind farms, generating clean energy for use by Islanders.

PEI has rooted experience in solar and storage technologies with local companies like Aspin Kemp^{xvi} & Associates that are actively expanding energy projects on PEI. It built its reputation on building batteries for harsh environments. It's now been one of a dozen installers of solar PV on the island and is a major player in the development of clean energy propulsion systems for the Canadian Coast Guard. The construction of the utility-scale solar farm in Summerside is the most recent demonstration of PEI's willingness and capacity to implement renewable technology beyond wind turbines.

Data has often been referred to as the new gold. If so, energy data is the new currency for energy savings. PEI's Sprypoint^{xvii} is a leader in managing data for utilities and sells its products to utilities across North America. Researchers at the University of Prince Edward Island are studying new technologies to use data and manage energy.

Being a small island allows us to encourage innovation and to work closely with utilities to provide energy to our province. Summerside Electric has been taking advantage of its status and size by implementing important pilot projects. The municipally owned utility^{xviii} is recognized as a leader in Canada when it comes to building smart energy systems. Its Living Lab^{xix} is a Hub for innovation by supporting testing and experimentation. It is a place where electricity users and producers co-create new ways to manage electricity through consumer behaviour change, technologies, and business models.

The emergence of clean fuels such as hydrogen and biofuels/sustainable biomass also provide new business opportunities. With a clear pathway for decarbonization, PEI's Energy Blueprint should provide the stability and predictability of a market for new technologies and approaches throughout the Island and be ready for export to the world. Early adoption by Island utilities will provide a foundational "Proof

of Concept” for export to other regions and support new jobs here while providing new export revenue growth.

21. Do you believe PEI can be a leader in innovation by targeting key niche markets and specialisations? Yes / No

22. What key areas do you think PEI should target?

- ☐ Research and development on managing intermittent renewables
- ☐ The development and testing of the viability of new clean fuels
- ☐ Developing techniques to achieve the highest standards possible for net zero buildings
- ☐ Other: _____

23. What role should Island utilities play in building and operating new renewable energy generation projects and storage? Should they

- ☐ build, own and operate them;
- ☐ build, own and operate them but only in partnership with community and First Nations interests
- ☐ Island utilities should not build, own, or operate these technologies

Building the Workforce

Technology alone will not solve our clean and green energy needs. We also need people with technical skills and experience. They may be newcomers or already here. A Human Resources Plan for Energy Transformation will help make Islanders aware of the stable career opportunities as we look out 20 years or more. Collaboration between industry and our post secondary institutions will help define the needs and gaps in training. This has been done previously with Holland College’s Wind Turbine Technician program and can be done in the future to address our changing workforce needs. We must consider new models for skills upgrading including online courses. But the pace of change will require an “all of the above” approach to education and training. So, we must also integrate energy human resources needs into our strategies to attract people to move to Prince Edward Island.

The utility sector reports no workforce shortages today, but the supply chain sector is struggling. Some skilled trades' needs are obvious with established training programs, while some jobs we will need in the future are barely defined today. For example, the production and use of hydrogen will require training and certification in handling this fuel. As there is little need for such training today, a whole curriculum development and delivery system will need to be developed. And since it is not yet clear how we would use hydrogen, the training needs to be flexible and adaptive.

24. Do you agree with an “all of the above” strategy which builds skills and opportunities for Islanders while also seeking the skills and experience of others to move to Prince Edward Island?
Yes / No
25. Do you think remote learning can play an important role in building technical skills which has traditionally been “hands on” learning? Yes / No
26. Do you have any comments on the need for new skilled personnel?

Improving Accountability

A key part of our Energy Blueprint will be to ensure there is accountability for the success of making our energy systems reliable, affordable, and net zero, on time. We need to make policy decisions on more detailed targets and requirements. We also need to decide what accountability looks like when many of the choices and actions will be by individuals. For example, regulated utilities can be held accountable for reliability standards and storm responses via performance standards. The Energy Blueprint will outline the areas where performance standards could be set, and the Operational Plan will show how they will be put into effect.

But in other areas, who is accountable is not so clear. For example, who should be responsible for making sure we reach targets for electric vehicle adoption and be responsible for addressing shortfalls? Planning for more electricity or new uses for biofuels/hydrogen is also complicated. How fast the clean fuels sector grows has impacts on electricity and new, improved battery storage technologies could stunt the growth of these new fuels. How should we set the targets and what should be the consequences for slippage?

Opportunities to buy power from outside the province may make sense to improve reliability, stability, and provide an opportunity to access supplies when market prices are low. Lower costs for community-based renewables (solar PV and storage) may make local generation more attractive, and local energy investments open new jobs and business opportunities. The new net zero energy system will likely be a balance of on and off-island energy supplies. Who should be held accountable for making the plans for all this and ensuring they are updated as conditions change?

Those plans will need to take an integrated approach. We must consider electricity needs as well as clean fuel needs, and leverage investments in one sector to support other sectors. We will need a legal basis for making the plans and making sure they succeed. The Blueprint’s Operational Plans will need to balance all objectives (affordability, reliability, resiliency, economic growth) and will be regularly updated to consider new price assumptions and demand increases. The Operational Plans will guide new central generation and consider the investments by energy users at the building or community level. It will clarify roles and responsibilities. It will answer the question of who is responsible to keep our energy systems working, and how fast they must act to get them back up when something goes wrong.

27. Who should be responsible for energy planning in PEI?

- ☐ Utilities (Summerside and Maritime Electric)
- ☐ Regulator (IRAC)
- ☐ Government

28. Which of the following statements best describes how Maritime Electric, as a regulated utility, should be held accountable for its performance?

- ☐ Penalties should be applied if Maritime Electric does not achieve set standards
- ☐ Rewards should be provided if Maritime Electric achieves set standards

29. In which of the following areas should standards be set to evaluate Maritime Electric's performance? [check all that apply]

- ☐ Proving reliable power, that is keeping the lights on
- ☐ Providing customer service in a timely fashion
- ☐ Keeping rates as low as is reasonably possible
- ☐ Being innovative in its use of technologies and rate designs
- ☐ Other: _____

30. Considering the challenges of climate adaptation, who should be responsible for investing in the resilience of the Island's energy supplies for:

- electricity – The customer/ratepayers or the government/taxpayers
- oil and gas - the customer through prices or the taxpayers through government supports

Working with Others

Much of the work ahead on the transition to Net Zero will be done on the Island by Islanders. However, we will also work in equal partnership with the Government of Canada. Federal programs and funds will open pathways for us to make a more cost-effective transition. Federal and provincial financing and program models are already driving change in energy efficiency and building-level electrification. National programs for infrastructure will help us build a more responsive grid and new charging/fueling infrastructure and explore the use of hydrogen/biomass/biofuels and renewable natural gas.

Collaboration with our neighbours will also help us gain access to new energy resources to supplement new on-Island resources. We may gain access to resources in Quebec and Labrador through a version of the Atlantic Loop project which would be used to upgrade the capacity of a regional transmission system. New resources include renewable energy and potentially new clean supplies from Small Modular Nuclear Reactors (SMRs). Being open to new technologies and new regional supplies could be considered as a way to maintain a diverse portfolio of potential energy supplies. Diversifying energy supplies can help reduce the risk that problems emerge from any single supplier.

The Government of Canada has set up collaborative forums to align regional priorities, identify funding and financing opportunities, as well as policy and regulatory approaches to accelerate economic activity. They are also positioning every region in Canada to lead in areas where they have or can reasonably create comparative advantage in the net-zero future. PEI joined this process in October 2022^{xx}.

We will also work with all provinces on new codes and standards for the development, transport, and use of hydrogen. This will be particularly important for the transportation of long-distance freight by land and sea.

Where should we put the Most Attention?

A good strategy means making choices. While many things can be useful, it is important to concentrate on what needs to be done first. In the Energy Blueprint we will reflect Islander priorities. At this stage in reading the Discussion Paper you should be able to outline what you think are the most important priorities to achieve the objectives.

Providing Input

As we have noted throughout, your input can be made by going to our [Blueprint Website](#) where we will be collecting your answers to the questions we have posed as well as recording anything else you would like to say. If you would like to join your neighbours in developing a community response or simply hear what your neighbours think, we are planning to hold Community Conversations throughout the Island in May. For information on the sessions and to keep up to date with our process, please go our [Blueprint Website](#)

Resources

Planning for a cleaner, greener, more sustainable energy future can be daunting. Some resources for people to dive deeper may be found here:

General Regional Energy Information

- Library of Regional Energy Information from Atlantica Centre for Energy
<https://www.atlanticaenergy.org/uploads/file/Atlantic%20Canadas%20Energy%20Transition%20-%20Earth%20Day%20Resources%20-%20%20Atlantica%20Centre%20for%20Energy.pdf>

Electric Vehicles and Storage

- A Globe and Mail story on the coming revolution in Battery to Grid (B2G) EVs
<https://www.theglobeandmail.com/drive/article-with-shift-to-electric-carmakers-look-to-tackle-grid-problems-and/>
- A story on the role school buses could play in B2G
<https://electricautonomy.ca/2022/11/08/v2g-electric-school-buses-canada/>
- A story on the issue of reliability for ERV chargers
<https://electricautonomy.ca/2022/11/11/ev-charger-reliability-canada/>
- NRCan's request for information on grid readiness for electric vehicles
<https://www.nrcan.gc.ca/climate-change-adapting-impacts-and-reducing-emissions/green-infrastructure-programs/smart-grids/what-we-heard-nrcans-request-for-information-on-grid-readiness-for-electric-vehicles/24093>
- **Canadian Hydrogen Policies**
<https://www.lexology.com/library/detail.aspx?g=2300b728-940d-456e-bdc0-a7b874b81319>
- Hydrogen Tax support in Fall Economic Statement
https://www.lexology.com/library/detail.aspx?g=b1a62389-d144-4d21-87ae-a340033e5a87&utm_source=Lexology+Daily+Newsfeed&utm_medium=HTML+email+-+Body+-+General+section&utm_campaign=Lexology+subscriber+daily+feed&utm_content=Lexology+Daily+Newsfeed+2022-11-11&utm_term=

Micro-grids and Resiliency

- Microgrid Resiliency in the Face of Hurricanes
<https://www.microgridknowledge.com/distributed-energy/article/11436860/microgrids-created-electric-sanctuaries-amidst-the-devastation-of-hurricane-ian>

Recent prices in the United States for Renewables

Note: Canadian energy information is available from the Canadian Energy Regulatory, however the information is not as timely and Canadian price trends are similar to those in the United States.

- US Prices and trends for Solar PV and Storage
<https://emp.lbl.gov/tracking-the-sun/>
- US Prices and Trends for Onshore Wind
<https://emp.lbl.gov/wind-technologies-market-report/>

Rate Designs to bring benefits to all customers from Building-level Solar and Storage

- US Paper from Berkley Labs on new ways to get value from residential solar PV and storage systems
<https://emp.lbl.gov/publications/private-vs-public-value-us>

Biofuel in Canada

- An article on Biofuels in Canada
<https://www.canadianbiomassmagazine.ca/a-look-at-canadas-low-carbon-fuel-policies-and-production/>

ⁱ<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000901>

ⁱⁱ<https://irac.pe.ca/wp-content/uploads/A-Resp-to-Interr-from-Synapse-2022-Capital-Budget-and-ISP-filed-Oct-22-2021.pdf>

ⁱⁱⁱ<https://apps.rec-cer.gc.ca/ftppndc/dflt.aspx?GoCTemplateCulture>

^{iv}<https://www.atlanticaenergy.org/energy-knowledge-centre/energy-maps/prince-edward-islands-energy-resources/>

^v<https://irac.pe.ca/wp-content/uploads/2023-General-Rate-Application-June-20-2022.pdf>

^{vi}<https://www.summerside.ca/residents/electricity#:~:text=Our%20electrical%20system%20is%20made%20up%20of%3A&text=46%25%20of%20Summerside's%20electricity%20comes%20from%20wind%20power>

^{vii}<https://apps.rec-cer.gc.ca/ftppndc/dflt.aspx?GoCTemplateCulture&GoCTemplateCulture=en-CA>

^{viii}<https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-prince-edward-island.html#:~:text=PEI%20has%20an%20estimated%20generating,PEI%20is%20from%20wind%20farms>

^{ix}https://www.princeedwardisland.ca/sites/default/files/publications/2040_net_zero_framework_for_feb_23_2022.pdf

^x<https://novascotiarp.com/updates>

^{xi}Envigour Policy Consulting Analysis for SGIN Conference 2022

^{xii}https://atb.nrel.gov/electricity/2022/utility-scale_pv-plus-battery

^{xiii}<https://www.nrcan.gc.ca/energy-efficiency/buildings/new-buildings/canadas-national-energy-code/20675> and <https://www.princeedwardisland.ca/en/news/national-building-code-standards-effect-march-31-2021> and <https://www.princeedwardisland.ca/en/information/agriculture-and-land/building-and-development-in-pe>

^{xiv}<https://www.upei.ca/communications/news/2022/02/upei-collaborates-peis-clean-tech-park-and-clean-tech-academy> and <https://www.princeedwardisland.ca/en/news/new-clean-tech-park-to-bolster-new-industry-and-opportunities-on-pe>

^{xv}<https://www.weican.ca>

^{xvi}<https://www.aka-group.com>

^{xvii}<https://sprypoint.com>

^{xviii}<https://www.summerside.ca/residents/electricity>

^{xix}https://www.summerside.ca/business/living_lab_innovation

^x<https://www.canada.ca/en/natural-resources-canada/news/2022/10/minister-wilkinson-launches-phase-2-of-the-regional-energy-and-resource-tables.html>

