
Innovations in Renewable Energy

— Assessing the Federal Green
Party's Renewable Energy Goals —

Agenda

1. Introduction
2. Goal 1: Retrofits
 - a. Issues
 - b. Recommendations
3. Goal 2: National Energy Grid
 - a. Issues
 - b. Recommendations
4. Q&A

Goal 1: Energy Efficiency Retrofits

“Launch a **massive energy efficiency retrofit of residential, commercial and institutional buildings**. To make a renewable energy transition possible, we have to eliminate energy waste. According to trade union research, this will create over four million jobs.”

What Is A Retrofit and Why Do Them?

- Energy efficient retrofitting is the refurbishment or upgrading of an existing building in order to reduce that building's carbon emissions.
 - This can look like: adding insulation, upgrading lighting fixtures, replacing window glazing, replacing heating or cooling systems with energy efficient models, or significantly upgrading the interior. All with the goal of improving the building's sustainability.
 - Retrofits can be classified as low-grade (ie. upgrading light fixtures) or deep (ie. replacing heating or cooling systems).
- Retrofits are important because:
 - 22% of carbon emissions comes from powering, cooling, and warming residential and commercial-industrial buildings. Buildings are also often the top emitter of greenhouse gas emissions, in Toronto they make up 55% of emissions.
 - Retrofits not only decrease carbon emissions, but they also lower energy costs, reduce maintenance needs, improve quality of interior, and increase building's value and productivity.

Issue 1: Scope

- Intention is to retrofit all residential, commercial, and institutional buildings. Potential deadline is 2030 as mentioned their 2019 'Mission Possible' Climate Action Plan, as well as the platform's target of changing the building code to "meet net-zero emission standards by 2030".
 - EU countries with similar net-zero ambitions have set targets at retrofitting 3% of building stock per year rather than Green Party's 10%. Canada is currently below 1% per year.
- Unclear if project is deep energy retrofits or on site renewable energy systems, which are more expensive.

Issue 2: Cost

- Green Party has pledged \$2.75 billion to retrofits.
- Liberal Party has committed a similar number of \$2.6 billion over seven years which has been criticized by climate activists as being too low to sufficiently cover the cost of retrofitting on a national scale.
 - The Task Force for a Resilient Recovery priced national retrofitting at \$26.9 billion over five years.
 - The Pembina Institute estimated an annual cost of \$10-15 billion in order to reduce carbon pollution from homes and buildings to zero by 2050.

Recommendations

1. Focus instead on deep retrofit of buildings over 35 years old in order to significantly reduce carbon emissions by 2030, meeting Canada's target in the Paris Agreement.
2. Pursue deep retrofits at points of natural renewal for buildings, as equipment is renewed in 15 to 30 year cycles, as such 3 to 6% of Canada's equipment is renewed annually - these are opportunities for energy retrofits.
 - a. Incorporate solar or other renewable energy sources into building upgrades.
3. Increase money pledged to retrofitting to follow through on platform goal of: "[Financing] building retrofits and installation of renewable energy technologies such as solar and heat pumps through direct grants, zero-interest loans and repayments based on energy/cost savings."
4. Develop a retrofit roadmap to understand where in Canada retrofits have highest cost and energy investment return.

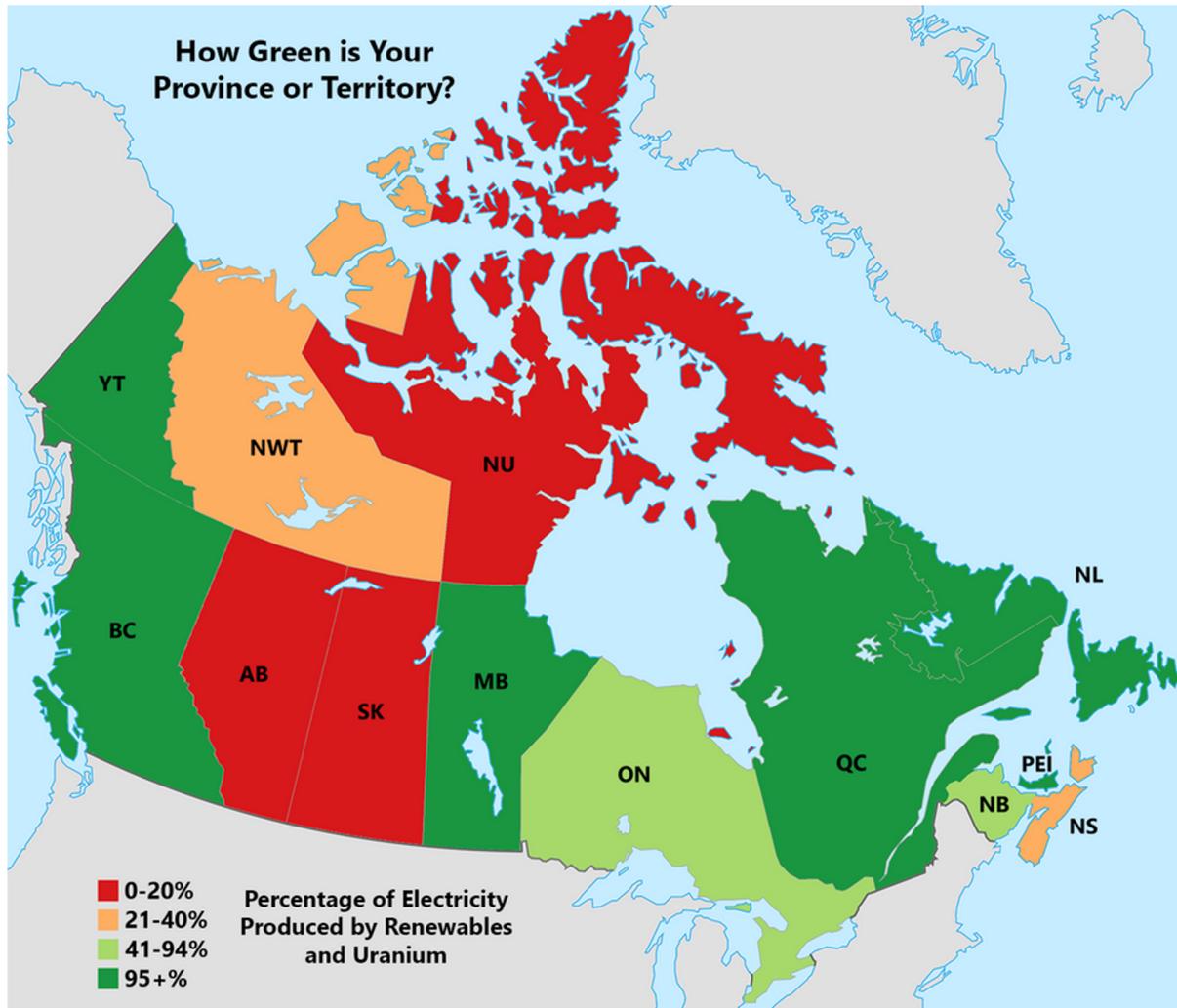
Goal 2: National Energy Grid

“To enable renewable electricity to **flow across provincial and territorial boundaries**, implement a national electrical grid system, including build connections between east Manitoba and western Ontario, and upgrading connections between New Brunswick and Nova Scotia. This will be paid for with money now allocated for expanding the Trans Mountain pipeline (**\$1.6 billion announced in December 2016, towards an estimated \$10-13 billion**), and create thousands of jobs nationwide.”

Why a National Grid?

- A national grid would link Canada's energy systems together to transport clean hydroelectricity between provinces and territories
 - 61% of Canada's electricity was generated through hydro plants in 2018
- Currently, there is very limited interprovincial electricity trade
 - Have and have-not provinces
 - BC, MB, QC, NL all have high hydroelectric production capacity and established generating stations
 - Reliance on high-emission, high-cost petroleum in northern and off-grid communities
- Possibility of establishing a stable, renewable energy supply for all Canadians and transition away from non-renewables

How Green is Your Province or Territory?



Issue 1: Scope

- Energy is the responsibility of each province/territory
- Different production and regulatory landscapes in each jurisdiction
 - In some provinces, public utility companies play leading roles in energy generation and transmission
 - Energy is a profitable business -- a national grid won't be in every actors' interest
 - Canada Energy Regulator
- Proposed grid would require cooperation between all provinces, territories and the various energy corporations in operation
 - Previous attempts at joint-ownership and transport of hydroelectric power have not gone well
- Implementing a grid in Canada's North also poses unique challenges

Issue 2: Cost

- Unlikely that \$10-13B will be enough to fully implement a national grid
- Infrastructure
 - Report by the Conference Council of Canada found that over \$290B was required to meet Canada's electricity infrastructure needs between 2010 and 2030
 - Bipole III transmission line in Manitoba, which is ~1,400km, cost \$4.77B
- Potential incentives to nudge provincial governments, territorial governments and energy corporations towards cooperation
- Nunavut, the Yukon, and the Northwest Territories face unique energy grid challenges
 - ~100,000 off-grid residents
 - Extreme cold, ice poses risk to powerlines

Recommendations

1. Advocate for interprovincial grid pilot projects to develop a shared grid framework and national energy market that can expand across Canada
 - a. Atlantic Loop
 - b. Interprovincial links in Western Canada following this
2. Develop and publish a comprehensive timeline for implementing a national grid to give the project credibility and momentum
3. Allocate funding towards investment in electricity infrastructure research and innovation to address northern community grid challenges

Q&A

Appendix: References

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