



Canadian
Electricity
Association

Association
canadienne
de l'électricité

The background of the entire page is a photograph of a large steel transmission tower against a sunset sky. In the foreground, a surveyor wearing a hard hat is silhouetted, looking at a set of blueprints. A surveying instrument on a tripod is also visible. The sky is a mix of orange, yellow, and blue.

POWERING THE FUTURE

CANADA'S ELECTRICITY ADVANTAGE

CEA INPUT INTO THE GENERATION ENERGY FORUM
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A. INTRODUCTION

It is often quipped that if Thomas Edison were alive today he would have no trouble recognizing the electricity system that he helped to develop in the late 19th century.

Power is generated at scale, often far from customers; stepped up to a high voltage; transmitted long distances over high-voltage lines; stepped down into a distribution system; and delivered to customers. The system is designed around safety, reliability, universal access and affordability. It relies on economies of scale, sound engineering and efficient project management.

The model remains dominant across Canada. Its track record speaks for itself. Canadians enjoy some of the cleanest, most reliability, most affordable electricity on the planet – usually without knowing very much at all about the complex machine that is set into motion with every flick of a light switch.

Building on this success, the electricity sector's mandate continues to expand. Electricity companies are providing climate change leadership, both in terms of mitigation and adaptation. They are investing in a modern grid capable of integrating a growing array of distributed energy resources. They remain committed to energy efficiency and customer education. In short, they are building the future today. Mr. Edison would have been proud.

As we move forward down this path of energy system transition and innovation, success will come from striking the right balance between benefits and costs; between investing in new technologies and stranding assets; between national ambition and technological reality; and between paying now or paying later. The right balance will enable us to forge a long-term national consensus, supported by an informed public.

The transition will not be a sprint and nor will it be easy. To find success, we will need to firmly establish where we are going, how we are going to get there, and what the journey will cost. And then we must find the collective persistence to stay the course.

The Canadian Electricity Association (CEA¹) and its members have been working hard to determine the appropriate balance for the electricity sector. In April 2014 CEA published a report titled *Vision 2050: The Future of Canada's Electricity System*, which advanced a vision for the future of electricity in Canada and offered ideas for how to achieve it. This report was followed in early 2015 by *Electric Utility Innovation: Toward Vision 2050*, which discussed how emerging technologies would allow Canada's electricity companies to deliver on growing expectations. Since the publication of these foundational documents, CEA has published numerous submissions, white papers and speeches on the future of the electricity sector. Links to a selection of these materials is provided in Appendix A.

In addition to published materials, CEA has formed an Emerging Issues Committee which has the mandate to look 10, 20, and even 30 years into the future to anticipate what it may hold.

For CEA, Natural Resources Canada's *Generation Energy Forum* and the ongoing related dialogue aligns well with this body of work. We must envision the future so that we can take concrete steps today. This short CEA paper aims to contribute to the discussion by exploring the electricity sector's role in an evolving energy system and suggesting principles that ought to govern our collective action.

B. POWERING THE FUTURE

Energy is the foundation upon which the Canadian economy is built. The sector employs over one million people from coast to coast to coast and accounts for a full 10% of Canada's GDP. The other 90% of Canada's economic activity benefits from assured access to reliable, affordable energy. Canadian families, too, require energy to thrive. Mobility, comfort, productivity – energy is fundamental to the Canadian way of life.

¹ Canadian Electricity Association (CEA) members generate, transmit and distribute electrical energy to industrial, commercial, residential and institutional customers across Canada every day. From vertically integrated electric utilities, independent power producers, transmission and distribution companies, to power marketers, to the manufacturers and suppliers of materials, technology and services that keep the industry running smoothly -- all are represented by this national industry association.

The energy system is characterized by slow capital stock turnover, capital intensity, and long lead times for project approval. Some communities rely on traditional energy resources for their livelihoods – and have for generations. Others are resistant to any new infrastructure built nearby. Turning the energy system is like turning an ocean-liner. It has got to be done by degrees, gradually and steadily over time.

And yet we know change is inevitable and increasingly urgent. Global greenhouse gas emission levels have been rising for decades. Severe weather and other climate impacts are both more frequent and more intense. Canada must do its part internationally while protecting its interests at home. It is a delicate balance indeed.

Fortunately, Canada has an advantage when it comes to achieving energy system transition objectives: our electricity sector is already over 80% greenhouse gas emissions free. Moreover, the sector has reduced emissions by over 30% since 2005 and is set to do so again by 2030.

This advantage goes beyond the electricity sector itself. Our national power mix – almost two-thirds hydropower, 16% nuclear, 4% wind and a growing solar resource – positions Canada to make deep emission reductions in high-emitting sectors as well, like transportation, space heating and industrial processes.

We know that to achieve deep decarbonization while growing the Canadian economy the electricity sector must expand significantly, likely tripling in terms of generating capacity by 2050 unless there are ground-breaking advances in energy efficiency.

The weight of this 'lift' should not be underestimated. Electricity rates will likely increase in the near-term as 100-year assets are paid off over the first 30 years of operation. Local concerns will clash with national interest. Energy consumers will resist change in favour of the energy sources they have always known. And the tried and true technologies will continue to deliver value that cannot be overlooked.

Within the electricity sector, for example, natural gas is a critical asset to the regions of Canada that are pivoting away from unabated coal-fired generation. Natural gas enables both environmental performance and system performance. It is a low emitting (GHG and air pollutant) fuel, pairs very well with intermittent sources like wind and solar generation and is the lowest cost option in many parts of Canada. Natural gas will remain an important source of electricity generation for the foreseeable future.

We must be realistic and pragmatic, then, in terms of how aggressively Canada pushes the pace of change. Organic evolution, strategically prompted by public policy, will lead to least-cost, widely supported outcomes.

C. PRINCIPLES FOR CANADA'S ENERGY SYSTEM TRANSITION

It is very difficult to predict the end-state of Canada's energy transition. The Government should put forward a compelling national vision, and work with industry, Indigenous people, stakeholders and the public to determine guiding principles. This will establish the parameters within which innovation and technological development will deliver outcomes, allowing the end-state to emerge as the most efficiency path to achieving the established national objectives. In this section, CEA proposes six such principles.

i. Good Projects Must Move Forward

If Canada is to successfully navigate the transition to clean growth, regulatory barriers to clean energy projects must be reduced.

ReNew Magazine publishes an annual list of Canada's top 100 infrastructure projects by value. Eight of the top 10 projects, including the top three, are within the electricity sector and all are related to clean energy – two nuclear refurbishments, four hydroelectric dams and a transmission line which will deliver hydropower to a major urban center. These projects represent about \$67.5 billion worth of investment.

Clearly, major electricity projects are being approved and are moving forward. However, it is simply not enough. We must prepare for a decades-long buildout.

The federal government is in the midst of a major review of key pieces of legislation, including the Canadian Environmental Assessment Act, the National Energy Board Act, the Fisheries Act and the Navigable Waters Protection Act. This review must result in a long-term, stable, and predictable policy framework with embedded regional flexibility for economic, resource and market differences.

Process certainty is a basic requirement for attracting necessary capital. As long as good projects move forward in a timely fashion Canadian companies will build the assets needed to power Canada's future.

ii. [We Must Bridge the 'Innovation Gap'](#)

To successfully transition to a clean growth economy, we must bridge the "innovation gap" that currently exists between federal and provincial or territorial governments. The energy system transition will only be as effective as the innovation that enables it.

Customers want better service and climate action, but not higher bills. They want to be active energy managers, but only if it is easy and convenient. Grid operators are being asked to seamlessly integrate a dizzying array of plug-and-play technologies. It's all a little daunting. Without a doubt, there are significant innovation costs associated with transition.

CEA and our members are encouraged by the federal government's commitment to fund energy sector innovation. Budget 2017 outlined many new and improved funding options that will help ease the financial burden. However, one-time public sector funding mechanisms are not enough.

Support for sustained innovation spending must be embedded in our provincial economic regulatory frameworks. We must overcome the disconnect between government policies that prioritize innovation, and energy regulatory decisions that curtail the capital required to deliver on them. Without an explicit innovation mandate for rate-regulated electricity companies technological progress will not keep pace with expectations. This will lead to higher rates, lower customer satisfaction and missed public policy objectives.

The regulatory systems that govern Canadian electricity companies must balance the relentless focus on costs with an assessment of value: the value that electricity brings to the lives of Canadians and the economic life of this country. It is maximum value, not minimum cost, that should guide thinking.

The guiding vision and principle is to pass on to future generations a system that is at least as good as the one this generation was fortunate to inherit, but that is greener and better able to support energy innovation. For this, companies must be allowed to innovate, experiment, and explore new opportunities to grow the use of clean electricity.

iii. Indigenous Involvement is Critical

CEA members and Indigenous communities across the country enjoy a rich and long-standing relationship that stems from genuine efforts to establish and nurture constructive and meaningful partnerships based on established rights, mutual respect, and trust. This collaboration not only enhances our country's energy promise, but it also strengthens the fabric of local Indigenous communities.

These relationships have led to an array of actions in important disciplines, including:

- joint business ventures;
- Indigenous procurement;
- training and employment;
- cultural awareness programs;
- supporting national days of reconciliation;
- scholarships; and,
- specific capacity building.

Canada's energy transition offers an opportunity to further strengthen the ties between Indigenous communities and industry, including electricity companies. Because these ties speak to issues of

economic and social prosperity, strengthening relationships at the community, provincial, and regional levels will provide the foundation for future economic inclusivity, capacity building, and sustainability.

iv. [Leave No Canadian Behind](#)

There is a segment within Canada that still does not have access to the reliable, safe, clean and affordable electricity enjoyed by their fellow citizens. They are Canada's diesel-reliant northern and remote communities and they must not be allowed to fall further behind. We must ensure that all Canadians benefit from Canada's greener future by supporting northern and remote communities as they decrease their reliance on diesel.

Canada was built on the principles of equality and opportunity. Yet, despite the enormous potential for clean energy, over 70% of remote and off-grid communities in Canada rely on diesel-fuel for meeting their basic energy needs. This is an environmental as well as an economic challenge.

Diesel generators in many of these communities are at full capacity and the cost of electricity in some regions is as much as ten times the Canadian average. This limits local economic opportunities and stifles growth.

These communities deserve better options for power generation. We cannot have an energy transition for some, while others are left to fall further behind. That's not the Canadian way.

There is a second segment that faces an uncertain future: those Canadians living in communities reliant on 'sunset industries' like unabated coal-fired electricity generation. Canada must develop a national strategy, based on innovation, asset recycling, and retraining, to assist those affected. We have a duty to offset the social effects of Canada's transition to a clean growth economy. Again, no Canadian should be left behind.

v. [Protect the Competitiveness of Canadian Companies](#)

Similar to the principle that we must leave no individuals behind, we must also work to ensure that

Canadian companies are not unduly burdened by the energy system transition. Competitiveness matters, especially in this era of rising U.S. protectionism.

NAFTA negotiations continue, but the outcome is far from certain. The Trump Administration is also determined to reverse federal climate policy enacted during the Obama Administration. They have signaled their intention to leave the Paris Agreement, and will likely restrict the role of the EPA.

As the federal, provincial and territorial governments implement their separate and collective climate action plans, they must work with industry to both monitor and bridge the competitiveness gap between Canada and its largest trading partner.

vi. [Canadians Must Be Engaged](#)

Successfully transitioning to a more sustainable, clean growth economy will require broad national support. Public confidence is indispensable if we are to stay the course on this decades-long trajectory of change.

It is imperative that governments and industry work together to build public trust and confidence in our climate action strategies and resulting energy system transition. This is not simply a public relations exercise; cost perceptions pose a serious risk to sustained climate action. Canadians want to understand what they are paying for, and why.

Ultimately, it is the government's duty to set the level of ambition, define the public policy framework and support key projects and initiatives. Industry's role is to invest, innovate and implement these decisions. The public's responsibility is to actively engage in the process and understand the implications.

D. CONCLUSION

Canada's Natural Resources Minister Jim Carr is driving the national conversation on energy transition through *Generation Energy*, a dialogue which CEA fully supports. This is a valuable and needed initiative.

However, there are some pressing questions that will not be fully answered over two days in Winnipeg. It is critical, then, that the conversation not end on October 12th.

The balance between local and national interests, costs and benefits, price and value, today and tomorrow, must all be discussed openly and candidly. The national conversation must be structured, transparent, and ongoing. It must be sustained well into the future.

There is no shortage of key issues that require addressing. For example, what will be the electricity generation mix in 2040? 2050? What will be the adoption curve for electric vehicles? What emerging technologies will 'bend the curve' on our energy system transition? How can we build better public-private partnerships? How should the Canadian Energy Strategy be integrated into the pan-Canadian conversation going forward? And how can we build a North American energy strategy that takes advantage of our synergies, and contributes to a more competitive continental business environment?

Ask these questions to 100 Canadians and you will receive as many distinct answers.

For this reason, if we are to go far, we must travel this journey together. We must eventually unite around shared aspirations and common perspectives that respond to our challenges confidently and coherently. Policy makers will also be called on to make and stand by tough decisions. Moreover, governments must put forward a national vision for how our energy assets can best serve Canada's economic prosperity and Canadians' standard of living.

It will not always be easy, but transformational change rarely is. CEA stands ready to play its part.

E. CONTACT INFORMATION

To engage CEA in this important conversation, please contact:

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APPENDIX A – ADDITIONAL RESOURCES

1. Canadian Electricity Association (April, 2014). *Vision 2050: The Future of Canada's Electricity System*. <https://electricity.ca/wp-content/uploads/2014/03/Vision2050.pdf>
2. Canadian Electricity Association (February, 2015). *Electric Utility Innovation: Toward Vision 2050*. <https://electricity.ca/wp-content/uploads/2015/02/ElectricUtilityInnovation.pdf>
3. Canadian Electricity Association (June, 2017). *Canadian Climate Action: Clean Power and Consensus Building*. <https://cea-ksiu6qbsd.netdna-ssl.com/wp-content/uploads/2017/06/Paper-Canadian-Climate-Action.Clean-Power-and-Consensus-Building.pdf>
4. Speeches on a variety of subjects can be found on CEA's website at <https://electricity.ca/library/>