

# Talking Transition

## Appendix 1



# FAST TRACKING CLEAN POWER SURVEY

This survey is being delivered by James Gaede on behalf of Clean Power Pathways, a multi-year collaboration between the David Suzuki Foundation and university researchers to fast-track Canada's energy transition.

The purpose of this survey is to gather energy stakeholder input on:

- Canada's energy transition
- Clean power technologies and enabling solutions
- Opportunities and barriers to the energy transition

A summary of the findings will be published in a report in spring 2020.

We expect this survey will take you 15 to 20 minutes to complete. For all questions, we would like you to give your professional opinion on the preferred course of action to meet net zero emissions or better in Canada's energy system by 2050, not the position of your organization or what you think is most likely to occur.

There are 41 questions in this survey.



# RESPONDENT INFORMATION

First, we would like to know more about your work. This information will be anonymous.

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## 1. Please select the option below that most accurately describes your current organizational affiliation

Check all that apply

Please choose **all** that apply:

- Government, provincial
  - Government, federal Government, municipality
  - First Nations / Indigenous government
  - Regulatory body
  - Utility
  - Electricity system operator
  - University/college
  - Non-profit organization
  - Industry association
  - Energy services and/or consulting company
  - Private sector
  - Other:
- 

## 2. In which sector(s) of the electricity system do you have the most experience and/or knowledge?

Check all that apply

Please choose **all** that apply:

- Generation
  - Transmission / distribution
  - Energy storage
  - Efficiency / Conservation
  - Electricity consumer (commercial or industrial) Electricity consumer (residential)
  - Electrification of transportation Electrification of heating Electrification of industry
  - Other: \_\_\_\_\_
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### 3. With what type of electricity generation do you have the most experience and/or knowledge?

**Only answer this question if the following conditions are met:**

Answer was '**Generation**' at question '2 [sector]' (In which sector(s) of the electricity system do you have the most experience and/or knowledge? )

Check all that apply

Please choose **all** that apply:

- Renewable generation, excluding hydro and biofuels
- Hydro electricity generation
- Carbon-emitting generation, without carbon capture and storage (CCS)
- Carbon-emitting generation, with carbon capture and storage (CCS)
- Biofuel generation
- Nuclear generation
- Other: \_\_\_\_\_

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### 4. How many years of experience in the energy sector do you have?

Choose one of the following answers

Please choose **only one** of the following:

- Less than one year
  - 1 - 5 years
  - 6 - 15 years
  - More than 15 years
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## 5. Provinces where your energy sector experience and/or knowledge is most relevant

Check all that apply

Please choose **all** that apply:

- Alberta
- British Columbia
- Manitoba
- New Brunswick
- Newfoundland and Labrador
- Nova Scotia
- Ontario
- Prince Edward Island
- Quebec
- Saskatchewan
- Territories
- Canada-wide
- My work is not based in Canada

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## 6. Clean power, clean electricity and non-emitting electricity generation

Throughout this survey, we use the terms 'clean power' and/or 'clean electricity' to refer to electricity generation sources that are non-emitting.

'Non-emitting' means the process of generating and distributed electricity does not add any greenhouse gas (GHG) emissions to the atmosphere. Non-emitting electricity may still have GHG emissions associated with construction of the facility.

Therefore, in this survey clean power / clean electricity should be understood to include renewable energy source (e.g., wind, solar, hydroelectricity), nuclear energy and carbon-emitting generation with carbon capture and storage.

# ENERGY SERVICES

## 7. What attributes do you think Canadians will value from their electricity in a clean power future?

	1 - Not important at all	2	3	4	5 - Extremely Important	I do not have enough information to provide an answer
Reliable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Affordable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-emitting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Renewable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low impact on nature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Respects Indigenous rights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Innovative technologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 8. Additional comments

Please write your answer here: \_\_\_\_\_

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**9. How much value do you think Canadians will place on options to engage in and manage their energy services (e.g., net-metering, self-generation, load shifting, time-of-use pricing, etc.)?**

Please choose the appropriate response for each item:

	1 - No value at all	2	3	4	5 - A great deal of value	I do not have enough information to provide an answer
Response	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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**10. Additional comments**

Please write your answer here: \_\_\_\_\_

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# ELECTRICITY DECARBONIZATION

## 11. For Canada to reach net zero by 2050, how much more or less electricity will be required?

Choose one of the following answers

Please choose **only one** of the following:

- Less than in 2019
- About the same as in 2019
- Up to 50% more than in 2019
- Over 50% more but less than 100% more than in 2019
- Over 100% more than in 2019
- I do not have enough information to provide an answer

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## 12. Electricity currently supplies about 22 per cent of Canada's total final energy demand, with most of the remainder supplied by fossil fuels.

**For Canada to reach net zero by 2050, by what year should 50 per cent of Canada's total final energy demand be electrified?**

- Only numbers may be entered in these fields.
- Each answer must be between 2030 and 2050

Please write your answer(s) here: \_\_\_\_\_

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**13. For Canada to reach net zero by 2050, how would you prioritize the following options? You may choose not to prioritize one or more items by not dragging them to the second box.**

All your answers must be different and you must rank in order.

- Please select at most 5 answers

Please number each box in order of preference from 1 to 5:

- New clean electricity (including refurbishing existing generation)
- New clean electricity (including refurbishing existing generation)
- New carbon-emitting electricity with carbon capture and storage
- Retrofitting existing carbon-emitting electricity with carbon capture and storage
- Enabling technologies like transmission, distribution, smart grids
- Energy efficiency and conservation

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**14. For Canada to reach net zero by 2050, what should be the role of hydro?**

Check all that apply

Please choose **all** that apply:

- Build new, large (>200 MW)
  - Build new, medium (50-200 MW) Build new, small (<50 MW)) Refurbish existing
  - Build pumped storage hydro
  - None — no new hydro
  - I do not have enough information to provide an answer
  - Other: \_\_\_\_\_
-





	1 - Not important at all	2	3	4	5 - Extremely Important	I do not have enough information to provide an answer
Wind, onshore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wind, offshore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Small modular nuclear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mid to large nuclear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fossil fuel generation with CCS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Geothermal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Biomass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ocean energy (tidal/wave)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transmission lines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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## 18. Electricity decarbonization - Additional comments?

Please write your answer here: \_\_\_\_\_

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	1 - Not important at all	2	3	4	5 - Extremely Important	I do not have enough information to provide an answer
Electrification of light-duty vehicles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrification of medium-duty vehicles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrification of heavy-duty vehicles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrification of industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demand response / load-shifting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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## 20. Electrification and end-use changes - Additional comments?

Please write your answer here: \_\_\_\_\_

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## 22. Enabling technologies - Additional comments?

Please write your answer here: \_\_\_\_\_

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# POLICY OPTIONS

## 23. The current federal ambition is to strive toward 90 per cent of electricity in Canada to be non-emitting by 2030. To reach net zero by 2050, should Canada accelerate this timeline?

Choose one of the following answers

Please choose **only one** of the following:

- Yes
- No
- I do not have enough information to provide an answer

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## 24. How far forward should Canada move this target?

**Only answer this question if the following conditions are met:**

Answer was 'Yes' at question '23 [timeline90]' (The current federal ambition is to strive toward 90 per cent of electricity in Canada to be non-emitting by 2030. To reach net zero by 2050, should Canada accelerate this timeline?)

- Only numbers may be entered in these fields.
- Each answer must be between 2025 and 2029

Please write your answer(s) here: \_\_\_\_\_

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**25. To reach net zero by 2050, what target should Canada set to require new electricity projects be non-emitting?**

- Only numbers may be entered in these fields.
- Each answer must be between 2020 and 2050

Please write your answer(s) here: \_\_\_\_\_

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**26. To reach net zero by 2050, what target should Canada set to require nearly 100 per cent of electricity to be non-emitting?**

- Only numbers may be entered in these fields.
- Each answer must be between 2030 and 2050

Please write your answer(s) here: \_\_\_\_\_

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**27. To reach net zero by 2050, how should Canada's carbon pricing evolve after 2022?**

Please choose **only one** of the following:

- No further increases
  - Increase moderately
  - Increase significantly
  - I do not have enough information to provide an answer
  - Other: \_\_\_\_\_
- 

**28. Canada has set a target for all light-duty vehicles for sale in Canada to be zero-emissions by 2040. To reach net zero by 2050, should Canada accelerate the target?**

Please choose **only one** of the following:

- Yes
  - No
  - I do not have enough information to provide an answer
-

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**29. What year should Canada target for all light-duty vehicles for sale in Canada to be zero-emissions?**

**Only answer this question if the following conditions are met:**

Answer was 'Yes' at question '28 [ldvs]' (Canada has set a target for all light-duty vehicles for sale in Canada to be zero-emissions by 2040. To reach net zero by 2050, should Canada accelerate the target?)

- Only numbers may be entered in these fields.
- Each answer must be between 2030 and 2039

Please write your answer(s) here: \_\_\_\_\_

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**30. To reach net zero by 2050, what target should Canada set to require all new medium- and heavy-duty vehicles be zero- emissions?**

- Only numbers may be entered in these fields.
- Each answer must be between 2030 and 2050

Please write your answer(s) here: \_\_\_\_\_

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**31. To reach net zero by 2050, what target should provinces and/or municipalities set to require zero-emission heating and cooling for all new construction?**

- Only numbers may be entered in these fields.
- Each answer must be between 2030 and 2050

Please write your answer(s) here: \_\_\_\_\_

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**32. To reach net zero by 2050, what percentage of existing residential and commercial buildings should have undergone deep-energy retrofits by 2030?**

- Only numbers may be entered in these fields.
- Each answer must be between 0 and 100

Please write your answer(s) here: \_\_\_\_\_

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	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	I do not have enough information to provide an answer
An increased role community / Indigenous participation in clean power and enabling technologies will facilitate reaching net zero by 2050	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rising ratepayer costs will be a barrier to reaching net zero by 2050	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A shortage of skilled workers in Canada will be a barrier to reaching net zero by 2050	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Current market/ regulatory structures will be a barrier to reaching net zero by 2050	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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**35. What is the biggest clean power opportunity or factor that will facilitate Canada reaching net zero by 2050?**

Please write your answer here: \_\_\_\_\_

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**36. What is the biggest clean power challenge or barrier to reaching net zero by 2050?**

Please write your answer here: \_\_\_\_\_

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**37. How concerned are you about climate change?**

Please choose **only one** of the following:

- Not concerned at all
  - Not too concerned
  - Somewhat concerned
  - Concerned
  - Very concerned
  - Not sure
- 

## WRAP-UP

Thank you for taking the time to fill out this survey and offer your expertise.

Please feel free to distribute this survey to any other clean energy stakeholders by sending them the url (<https://cleanpower.limequery.org/465285?lang=en>)

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**38. Do you have any other advice or input as we embark on the Clean Power Pathways project?**

Please write your answer here: \_\_\_\_\_

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**39. I would be interested in providing additional data or other input to support modelling and scenario development for Clean Power Pathways. Please contact me for further details.**

Please choose **only one** of the following:

- Yes  
 No

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**40. I would be interested in future updates on the Clean Power Pathways and to learn about the results from this survey.**

Please choose **only one** of the following:

- Yes  
 No

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**41. Please select the option below that most accurately describes your current organizational affiliation**

**Only answer this question if the following conditions are met:**

----- Scenario 1 -----

Answer was '**Yes**' at question '**39** [contactagain]' (I would be interested in providing additional data or other input to support modelling and scenario development for Clean Power Pathways. Please contact me for further details.)

----- or Scenario 2 -----

Answer was '**Yes**' at question '**40** [moreinfo]' (I would be interested in future updates on the Clean Power Pathways and to learn about the results from this survey.)

**No options were provided in the Word Document.**

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