

FINAL REPORT 2020

11th Annual JACAC Student Forum

Energy Politics for the 21st Century: Searching for the Best Mix

February 14 – 22, 2020 | Fukuoka, Japan

Hosted by Seinan Gakuin University, Fukuoka, Japan
in cooperation with:
Prince Takamado Japan Centre for Teaching and Research,
University of Alberta
and Hosei University

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PREFACE: Messages from the Organizers

Dear Participants of the 2020 JACAC Student Forum

I hope you are staying healthy and safe, amidst the ongoing Corona crisis. In retrospect, I can say that we were fortunate to be able to host this year's JACAC Student Forum in its regular format. On behalf of Seinan Gakuin University, I would like to once again express my gratitude to all participants for their time, effort and the intellectually stimulating exchanges. I hope you have enjoyed your stay with us in Fukuoka. Some of you have joined this forum already equipped with substantial knowledge on the topic of energy policy. For many others, it was the first foray into a topic that they had not studied previously. As academic lead, I was impressed by your willingness to dig deep into the technological, economic and social advantages and disadvantages of various forms of energy generation suitable for Canada and Japan, irrespective of your background.

I'm certain that we have all learned a great deal over the course of this forum: Canadian students about Japan, Japanese students about Canada, majors in international studies, law or political science about energy generation and technology, and those majoring in engineering about political processes. The end results of your hard work were very convincing presentations that laid out a variety of potential solutions to the very real challenges facing Canada, Japan and indeed, the international community, as they formulate sustainable energy plans for the medium and long-term future. Some of you have come up with more ambitious proposals, others were more careful in their plans for a future energy mix; yet all presentations showed substantial insight into the various aspects of this complex issue ranging from existing and new technologies, pricing and regulations like Feed-in-Tariffs (FIT) or political realities like Not in My Backyard (NIMBY) movements. Even though we could pick only one team as the winner of the best presentation award, as academic lead, I was very happy to listen to six well researched and well-presented presentations.

Lastly, I hope this Forum has provided you not only with new insights about a timely topic of critical socio-economic importance as well as Canada and/or Japan in general; I have no doubt that the intercultural communication, interdisciplinary work that went into your final presentations and reports, and the friendships that were forged during this process will serve you well in your future careers. I wish you all the best for the future and hope to welcome you to Fukuoka again at some point in the future.

Best Regards,

Winkler, C. G., Ph.D.

Associate Professor, Faculty of Law, Seinan Gakuin University
Academic Lead, JACAC Student Forum 2020

Message from the Prince Takamado Japan-Canada Memorial Fund

The Prince Takamado Japan Centre for Teaching and Research was very pleased to welcome all Japanese and Canadian students at the 11th Japan-Canada Academic Consortium Student Forum at Seinan Gakuin University in Fukuoka, Japan in February 2020. First and foremost, we would like to express our sincere appreciation to Her Imperial Highness Princess

Takamado for her support and participation in the forum. We would also like to thank Ambassador Ian Burney for his generous backing. This forum was also supported by Hosei University, our new Japan-side secretariat institution and our other membership universities. Without their commitments, this forum would have been impossible.

This year, global warming and energy issues have received a lot of attention, due to a campaign initiated by a young Swedish activist, Greta Thunberg. Her passion has spread into the world, resulting a huge number of demonstrations. This year's academic lead, Professor Christian Winkler responded to this trend, and delivered a great forum under the very timely theme, "Energy Politics for 21st Century: Searching for the Best Mix." Our participants learned a lot of experiments aimed at reducing the output of carbon dioxide in Japan.

The JACAC student forum is the largest annual project undertaken by the Prince Takamado Japan-Canada Memorial Fund at the University of Alberta. The Japan-Canada Academic Consortium is one of the largest and most unique academic collaborations between Japan and Canada. It continues to offer our participants the opportunity to exchange their ideas with fellow students beyond national borders. It has helped them develop interests in global issues, encouraging them to pursue further research and careers.

The world has imposed on us another challenge due to the outbreak of COVID-19. During such crisis, I feel that our commitment to younger researchers is essential for the future of humanity.

Aya Fujiwara, Ph.D

Director, Prince Takamado Japan Centre for Teaching and Research

University of Alberta

1. BASIC INFORMATION

1-1. Japan-Canada Academic Consortium (JACAC)

“The Japan-Canada Academic Consortium aims to promote the exchange of undergraduate and graduate students, researchers, and teachers, and to encourage a movement of ideas and knowledge between the two countries.”

Main activities of Japan-Canada Academic Consortium (JACAC) are “Student Exchange Program” between member universities of Japan and Canada, and a one-week student forum called “JACAC Student Forum”.

As of 2020, JACAC consists of the following 20 member universities:

Canadian Universities: 10

University of Alberta | University of British Columbia | University of Regina | York University | Queen’s University | Université De Montréal | Concordia University | Université Laval | University of Prince Edward Island | University of Waterloo & Renison

Japanese Universities: 10

Meiji University | Josai International University | J.F. Oberlin University | Tsuda University | Kwansei Gakuin University | Hosei University | Ritsumeikan University | Seinan Gakuin University | Nagoya University | Hokkaido University

1-2. JACAC Student Forum

“Senior undergraduate student representatives from member institutions in both Japan and Canada will meet and exchange opinions and ideas about a common topic of interest to students today. The host institution shall alternate between Canada and Japan each year. The goal of this forum is to provide students with the opportunity to interact with their peers from a different culture, in order to gain insight into their current areas of academic interest and to encourage a flow of ideas between Canada and Japan. The official language of the forum is English.”

JACAC Student Forum has been held annually since 2010, and the past forums were held under a variety of themes. Each forum consists of expert lectures, fieldwork, group work including research study, group presentations, field trip, etc.

1-3. The 11th Annual JACAC Student Forum 2020

The 11th Annual JACAC Student Forum was hosted by Seinan Gakuin University, Fukuoka, Japan, in cooperation with Prince Takamado Japan Centre for Teaching and Research – University of Alberta (JACAC secretariat in Canada), Hosei University (JACAC secretariat in Japan), and the Embassy of Canada. A brief overview of the forum is as follows:

Date:

February 14 (Fri) – 22 (Sat), 2020

Venue:

Seinan Gakuin University, the Embassy of Canada

Theme:

Energy Politics for the 21st Century: Searching for the Best Mix

Content and Brief Schedule:

TIME	EVENT	VENUE	NOTE
Jan 17 (Fri)			
–	Pre-Assignment Deadline	Google Classroom	
Feb 13 (Thu)			
–	Canadian students – Departure from Canada	–	
Feb 14 (Fri) – Day 1			
	Canadian students and Japanese students – Arrival in Fukuoka	Fukuoka Airport	
20:30	Move to the accommodation, Brief Orientation - The Residential Suites Fukuoka	Arrival Lobby Domestic Terminal	Chartered Bus
Feb 15 (Sat) – Day 2			
9:30	- Assemble at the lobby of the hotel - Walk to the university		
10:00-12:00	- Welcome Remarks - Forum Orientation - Welcome Reception	Global Student Lounge, Bldg. 3	
12:00-17:00	- Group Work	Classrooms, Bldg. 3	
Feb 16 (Sun) – Day 3			
9:30-11:00	Lecture 1: “Energy Policies for the 21st Century - Searching for the Right Mix” - WINKLER, Christian Gerhard: Associate Professor, Department of Law, Seinan Gakuin University	III-304, Bldg. 3	
11:30-13:00	Lecture 2: “Law of Renewable Energy in Japan -RPS, FIT, FIP and Related Legal Issues-” - KOBAYASHI, Hiroshi: Professor, Faculty of Economics and Law, Shinshu University	III-304, Bldg. 3	
13:00-17:00	Group Work	Classrooms, Bldg. 3	

Feb 17 (Mon) – Day 4			
9:30-11:00	Lecture 3: “The Political Economy behind Japan’s Energy Policies” - WINKLER, Christian Gerhard: Associate Professor, Department of Law, Seinan Gakuin University	Multi-Purpose Room, Library	
11:30-13:00	Lecture 4: “Is Nuclear Power the Path to the Future?” - MARPLES, David Roger: Distinguished University Professor, Department of History and Classics, University of Alberta	Multi-Purpose Room, Library	
13:00-17:00	Group Work	Group Rooms, Library	
Feb 18 (Tue) – Day 5			
8:30-18:00	Field Work & Lecture 5 (On-site) - Visit to Tenzan Water Power Plant and Genkai Nuclear Power Plant	Karatsu City, Saga Genkai Town, Saga	Lecture will be provided on the bus.
Feb 19 (Wed) – Day 6			
9:00-13:00	Group Work	Group Rooms, Library	
13:30	- Assemble in front of the library - Walk to the subway station - Go to Fukuoka Airport Station	Library	
	Move to Tokyo - ANA258 Fukuoka 15:35 - Tokyo 17:10 Move to the accommodation by trains - GRIDS Tokyo Asakusabshi - Briefing for Day 7 + voting for MVP award	Fukuoka Airport/ Haneda Airport	
Feb 20 (Thu) – Day 7			
9:00-12:30	Group Work	Embassy of Canada	
13:00-16:00	Group Presentations		
16:00-17:30	Closing Ceremony		
17:30-19:00	Reception		
Feb 21 (Fri) – Day 8			
9:00-	Field Trip	Asakusa area, Tokyo	
Feb 22 (Sat) – Day 9			
	Canadian students & Japanese students - Departure from Tokyo	Haneda / Narita Airport	
Feb 28 (Fri)			
	Final Report Deadline	Google Classroom	

Participants:

24 in total (12 from Japanese universities, 12 from Canadian universities)

- | | | |
|---|--|--|
| — BOLDUC, William
Université Laval | — KAWAUCHI, Mio
Hosei University | — NISHIMURA, Marina
Ritsumeikan University |
| — CLIFFORD, Sarah
University of Alberta | — KIKUCHI, Kyosuke
Ritsumeikan University | — ROURKE, Serena
Queen's University |
| — COURCHESNE, Sophie
Concordia University | — KURIYAMA, Maho
J. F. Oberlin University | — SAMUEL, Hanisi
York University |
| — DELA CRUZ, Tadjana
University of Regina | — LEE, Justin CJ
Université Laval | — SHIMIZU, Nao
Meiji University |
| — FERNANDO, Mideki
Josai International
University | — LI, Jessica
University of
British Columbia | — TAKAHASHI, Mona
Kwansei Gakuin University |
| — FUJIIU, Tatsuki
Meiji University | — LI, Ruizhe
University of Waterloo | — TEMMA, Rena
Hosei University |
| — GOMEZ, Simple Marie
York University | — LOSIER-TREMBLAY, Simon
Université De Montréal | — THEUERKAUF, David
University of
Prince Edward Island |
| — ISHIGAMI, Chieka
Tsuda University | — MINE, Yuki
Kwansei Gakuin University | — UEDA, Hiroko
Seinan Gakuin University |

Organizing Committee:

The forum was organized mainly by the following committee members.

Academic Lead:

- Winkler, C. G., Ph.D.
Associate Professor, Faculty of Law, Seinan Gakuin University (Host University)

Program Coordinators:

- Mr. SHIMIZU, Yosuke
Manager, Center for International Education, Seinan Gakuin University (Host University)
- Ms. INOUE, Mariko
Asso. Manager, Center for International Education, Seinan Gakuin University (Host University)
- Ms. MOCHIDA, Michiko
Chief Program Coordinator, Global Education Center, Hosei University (JACAC Secretariat)
- Ms. KATO, Akiko
Coordinator, Global Education Center, Hosei University (JACAC Secretariat)
- FUJIWARA, Aya, Ph.D.
Director, Prince Takamado Japan Center for Teaching and Research, University of Alberta

2. DETAILS OF THE FORUM

2-1. Theme & Issues / Questions

Theme:

Energy Politics for the 21st Century: Searching for the Best Mix

Many energy sources we are relying on in our daily lives in industrialized societies are as important to many global and local economies as they are the objects of criticism: Fossil fuels remain one of the most important energy sources, yet have long been criticized for their negative impact on the environment. Nuclear power may be efficient, but security concerns have resurfaced after meltdowns at the Fukushima Daiichi nuclear power station in 2011. Advances have been made in tapping into renewable energy sources such as wind, photovoltaic or geothermal; however, at this point their share in most G7 countries' energy mix remains comparatively small. Participants in this year's forum will be asked to come up with their very own ideas in how to tackle the formidable challenges presented by formulating an energy mix for the 21st century and beyond.

Issues / Questions:

- How should advanced industrialized countries like Canada or Japan plan their future energy mix?
- What are the priorities that define how a future energy mix should look like?
- How can Japan and/or Canada leverage their geography and/or natural resources in a sustainable way?
- What are the benefits and risks of each energy source?
- Where should actors (be they states or private enterprises) focus their resources?
- Should existing technologies be improved or should more money be spent on researching new ambitious technologies like nuclear fusion?
- How safe can or should power plants be? Who should set and watch over those standards?
- How to convince local communities to host power stations?

2-2. Pre-Assignments

Prior to the forum, participants worked on pre-assignments.

2-3. Lectures

Lectures summaries:

'Energy Policies for the 21st Century - Searching for the Right Mix'

Dr. WINKLER, C. G., Seinan Gakuin University

As the first lecture of this year's forum, this talk will give a basic overview of the past and present of energy policy in Japan, Canada and other countries. Furthermore, we will discuss the various challenges different actors in politics, society and industry are facing, as they are trying to formulate a coherent set of policies going forward.

'Law of Renewable Energy in Japan -RPS, FIT, FIP and Related Legal Issues-'

Dr. KOBAYASHI, Hiroshi, Shinshu University

This lecture mainly will illustrate development of laws related to renewable energy ("RE") in Japan after overviewing recent energy mix. Both of Renewable Portfolio Standards ("RPS") and Feed in Tariff ("FIT") are commonly used to promote RE. After the RPS Act in 2002, the FIT Act has been enacted in August 2011, come into force in July 2012 and recently amended in Japan. By the FIT Act, RPS has been in principle replaced by FIT. In addition, Feed-in Premium ("FIP") may be employed in the future. I will explain RPS, FIT, FIP and legal issues regarding RE.

'The Political Economy behind Japan's Energy Policies'

Dr. WINKLER, C. G., Seinan Gakuin University

This lecture provides students with a closer look at the politics and political economy behind postwar Japan's energy policy. It will introduce students to 1) the peculiarities of the energy sector, 2) the Japanese government's agenda and approaches to siting and 3) the implications of the above for the present and the future of energy policy.

'Is Nuclear Power the Path to the Future?'

Dr. MARPLES, David Roger, University of Alberta

With the diminishment of natural resources such as coal, oil, and gas, along with attention to climate change, many countries are looking to nuclear power as a viable, clean alternative. This paper looks at the development of nuclear power in Canada and Japan, exploring the consequences of major accidents such as Chernobyl (1986) and Fukushima (2011) and the problems entailed with increased reliance on nuclear energy: accidents, proximity of population centres, disposal of nuclear waste, and public fears.

2-4. Field Work

This year, students visited Tenzan Hydropower Plant and Genkai Nuclear Power Plant in cooperation with Kyushu Electric Power Co., Inc. It was a great opportunity for students to deepen the knowledge that they have learned in the lectures.

2-5. Final Group Presentations

Participants worked together with their own group members and prepare presentations both prior to and during the forum. Each group is required to give a 15-minute presentation, followed by 5-minute QA session. Group 1-3 were asked to make a proposal for CANADA, while Group 4-6 for JAPAN. Presentations were evaluated by a panel of judges below:

Panel of Judges:

Ms. Christine Callahan, Embassy of Canada
 Dr. David Anderson, the Alberta Japan Office
 Dr. David Marples, University of Alberta
 Dr. Christian Winkler, Seinan Gakuin University

Schedule:

9:00	Arrival at the Embassy	
9:00-12:30	Group Work	
Presentations: Embassy		
13:00-13:10	Opening Remarks	MC: Mr. Yosuke Shimizu (Seinan Gakuin University), Introduction of the judges
13:10-13:32	Presentation and QA	MJ6 "Moving the Hump with the Pump"
13:33-13:55		suito~yo "Safety, Security and Stability: Japan's Future Energy Mix"
13:56-14:16		Team Hakata Maple "A 20/20 Vision for Japan's Future Energy Mix: The Gradual Phase-Out of Coal Energy and the Revitalization of Non-Operational Sites for Clean Energy"
14:17-14:25	Intermission	
14:25-14:47	Presentation and QA	Team 1 and only "An Energy Plan and Solution for 2030"
14:48-15:10		Forces of Nature, 9 to 5 "A Green Plan For A More Inclusive Canada"
15:11-15:31		JSMR "Towards a Sustainable 2040 Canadian Energy Mix"
15:31-15:55	Judges Evaluation / Break	

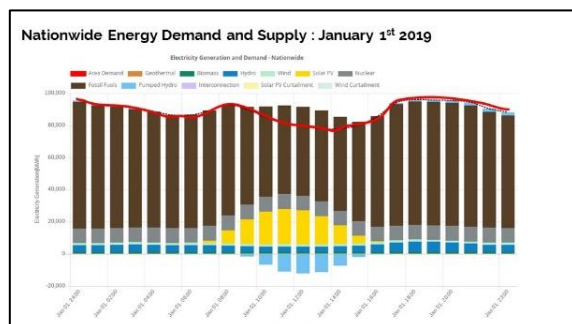
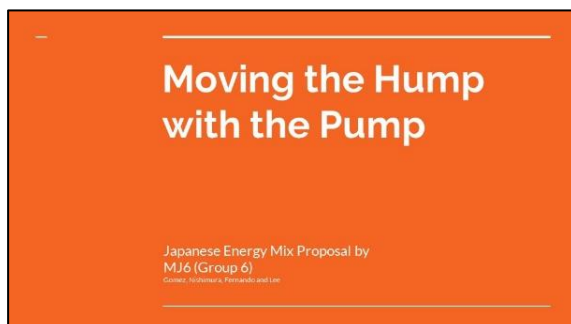
Closing Ceremony: Embassy		
16:00-16:05	Speech	Seinan Gakuin University Rep – Dr. Gary Barkley
16:05-16:10	Announcement of Winners	Dr. Christian Winkler, Academic Lead
16:10-16:25	Presentation by the winning team	Winning Team
16:25-16:40	Presentation of Awards Speeches	Her Imperial Highness Counsellor
	Meeting with HIH	
Reception: Embassy		
17:30-17:55	Welcome Speeches	Mr. Matt Fraser, Counsellor - Public Affairs ANDERSON, David, Managing Director, Alberta Japan Office Mr. HINO, Deputy Director, Global Education Center, Hosei University Dr. Aya Fujiwara, Director, PTJC
17:55	Presentation of Leadership Awards	Award Presenters – Dr. Winkler Photo Sessions
18:00	A Toast	Seinan Gakuin University Rep – Dr. Gary Barkley
18:30	Photo Sessions	
19:00	Reception Ends	

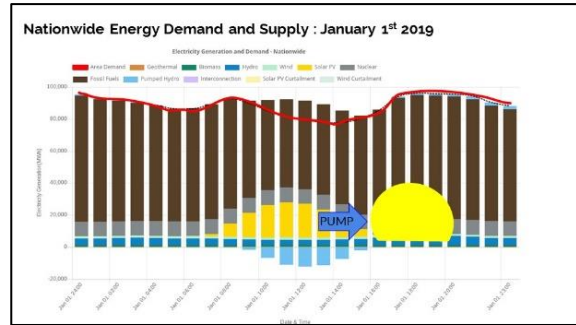
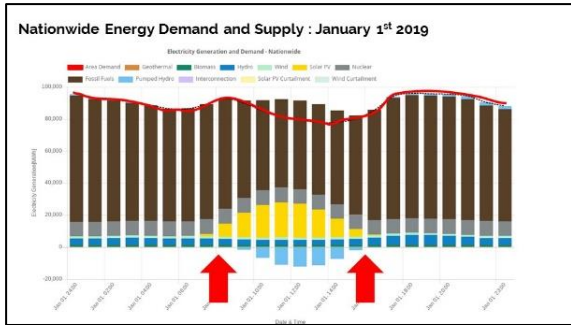
Student Presentations:

MJ6 (Group 6)

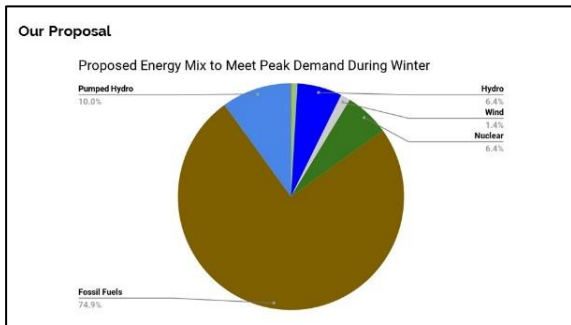
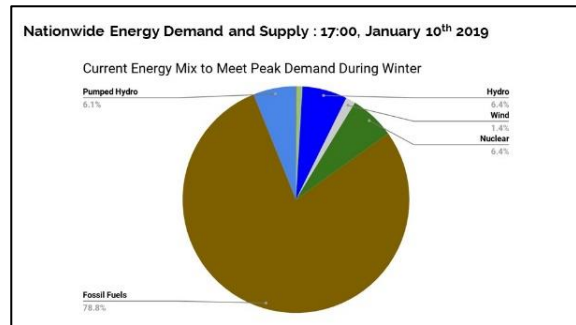
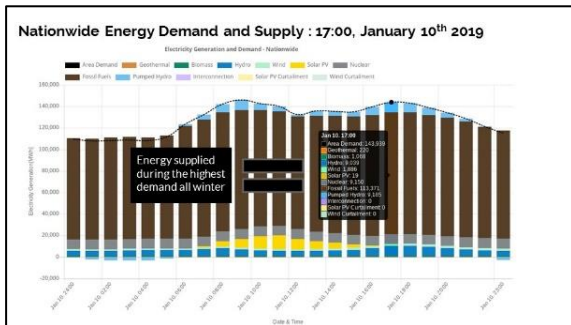
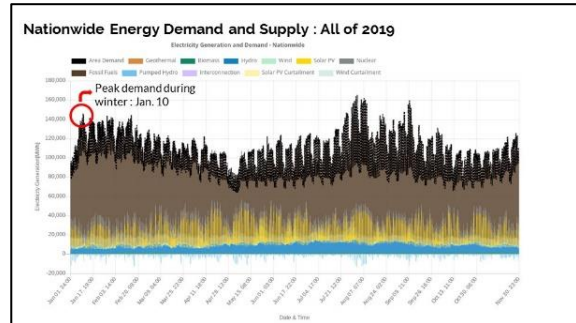
“Moving the Hump with the Pump”

FERNANDO, Mideki | GOMEZ, Simple Marie | LEE, Justin | NISHIMURA, Marina





Our proposal



6% to 10%

=

+5.6 GWh

of Solar Production and Storage Capacity

Why Solar?

1. Because solar is better than other renewables.
2. Because solar is better than other sources. Period.

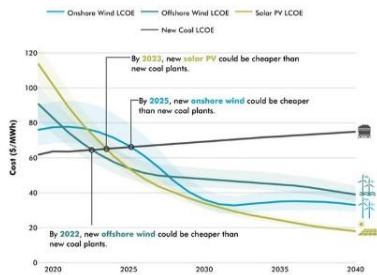
1. Solar vs other renewables

- It has historically been favoured in Japan
 - Support and momentum
- Easier to site and install
 - VS wind, geothermal and nuclear
- Domestic
 - Solar PV cells produced by Japanese companies
- Safe and less impact. Less NIMBY.
 - Wind - Noise
 - Geothermal - Concerns over water quality
 - Nuclear - Scary

2. Solar vs fossil fuels

- Safe + Low impact on environment. Big issue : Cost
 - Secondary issue : Energy Security, solved with storage
- Investing in solar is a great way to demonstrate Japan's commitment to sustainability.
 - Paris Accord, meet international obligations
- Potential decrease in the costs of solar
- Cost for generation: **13.1yen/kwh vs 13.7-30.6yen/kwh**

Price of solar vs price of coal



-66.66%

Reduction in cost of PV cells since 2010

Why is solar getting cheaper?

- Advances in technology
 - Greater efficiency, lower costs, easier to make money back
- Initial R&D costs have been recuperated
- Global investment
 - Race towards energy self sufficiency and carbon neutrality by many developed countries
- FIP and other policy initiatives :
 - Assure financial security for Japanese investors and energy producers

Cost estimate for proposed additional solar capacity

Cost of recent solar plant/Production capacity of plant

(Setouchi 'Kirei' Solar Farm, in Okayama Prefecture)

1 billion USD/1,645 GWh

X 5.6 GWh

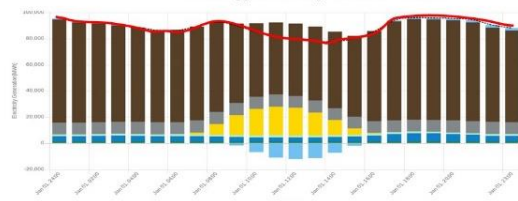
=3.4 billion USD

(estimate of cost to set up proposed production capacity in Japan)

Energy Storage

The issue

- Solar is producing energy at the wrong time
 - Overloading grid can be dangerous. Leads to blackouts.



The issue

It's expensive and inefficient to vary fossil fuel/nuclear production.

- Must **reduce production** at noon to avoid overload (solar production peak).
- Must **push plant to max capacity** to meet peak demand.

Conventional "Base Load" Plants run best when they produce a consistent amount of energy.




The solution : Move the Hump



Batteries

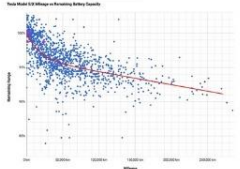
Batteries : Strengths

- You can put them almost anywhere
- High energy retention rate (80 - 90%)
- Adapt quicker and more accurately to the grid




Batteries : Weaknesses

- Relatively expensive, especially for large capacity
- Decays over time
- Technology will only get better from here



Batteries : Cost

Case Study, Hornsdale Batter project (South Australia)



Batteries : Cost

	Hornsdale Batter Project (South Australia)	Japan's Current Coal Plants Under Construction
Cost	60.82 Million USD	
Output capacity	129 MWh	
Cost/Output capacity	470.000 USD/MWh	
Cost of proposal (+5.6 GWh)	2.6 Billion USD	

Batteries : Cost

	Hornsdale Batter Project (South Australia)	Japan's Current Coal Plants Under Construction
Cost	60.82 Million USD	29 Billion USD
Output capacity	129 MWh	11.000 MWh
Cost/Output capacity	470.000 USD/MWh	2.636.000 USD/MWh
Cost of proposal (+5.6 GWh)	2.6 Billion USD	14.7 Billion USD


Batteries : Summary

Strengths	Weaknesses
High energy retention rate (86%)	Still relatively expensive
Easy to site and install	Capacity decays over time
Responds to the grid quickly and accurately	Investment now would be premature, they will only get better

Pumped Hydro


Pumped Hydro : How it works

- Water moves from an upper reservoir to a lower reservoir and back up
 - Turns a turbine to create energy
 - Can store up energy for use when peak demand
- Uses other renewables to pumped hydro back up
 - Solar energy excess can be used for pumping water during off-peak hours



Pumped Hydro : Strengths

- Uses Japan's existing infrastructure and geography
 - 26 hydroelectric plants in Japan are already pumping
 - Kanagawa plant will be second largest pumped hydroelectric plant in the world when complete
 - Japan's hydroelectric plants have the capacity to produce over 24,000 MWs
- Very little NIMBY
 - No loud noises or disruption to existing communities
- Hydroelectricity is reliable and long term
 - Water is consistent and can therefore increase solar reliability
 - Can store energy for long periods at a time



Pumped Hydro : Weaknesses

- Net loss of energy when using pumped hydro
 - Although, pumped hydro can have up to 80% retention rates, this can sometimes differ (eg. Tenzan Plant at 70%)
 - Needs to be used alongside other energy sources because it needs energy
- There is nowhere else to go!
 - There are a lot of potential places to build hydroelectric plants, but water rights are strict in Japan and generally, space is limited
- Upfront costs are expensive
 - Over time equipment also needs replacement and maintenance

Pumped Hydro : Cost

- Pumped Hydro is cheaper than other storage
 - Pumped Hydro costs \$200/MWh to \$250/MWh compared to \$350/MWh to \$1000/MWh for batteries
- 3E's + S
 - Economic Efficiency
 - Energy Security
 - Environmental Protection
 - Safety
- Hydroelectricity has so much potential
 - Hydroelectricity used to fuel Japan and with the use of pumped hydro, it can move back to using water as a major source

Pumped Hydro : Summary

Strengths	Weaknesses
Large initial capacity	Difficult to site
Low cost or even FREE (using existing infrastructure)	Low energy retention rate (70%)
Long lasting and long term	Hard to increase capacity
Low NIMBY	Environmental Impact

So batteries or pumped hydro?

Both.

Batteries + Pumped Hydro

Battery Weaknesses

- Limited initial capacity
- Decays over time
- Relatively expensive

Pumped Hydro Weaknesses

- Hard to increase capacity
- Low energy retention rate (70%)
- Difficult to site

Batteries + Pumped Hydro

Battery Weaknesses

- Limited initial capacity
- Decays over time
- Relatively expensive

Pumped Hydro Weaknesses

- Hard to increase capacity
- Low energy retention rate (70%)
- Difficult to site

Pumped Hydro Strengths

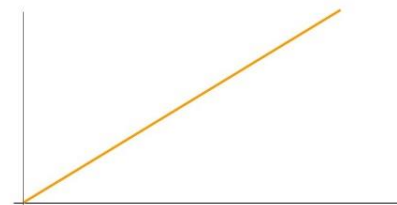
- Large initial capacity
- Never decays over time
- Free (unused capacity)

Battery Strengths

- Can always increase capacity
- High energy retention rate (85%)
- Can be installed anywhere

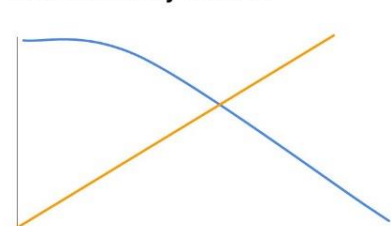
Cost Efficiency vs Time

Batteries



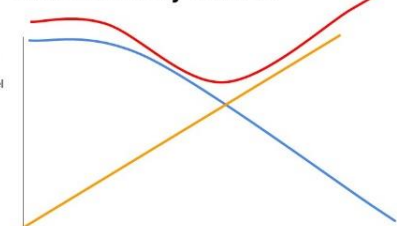
Cost Efficiency vs Time

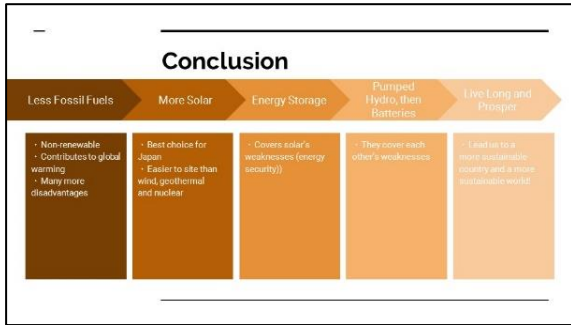
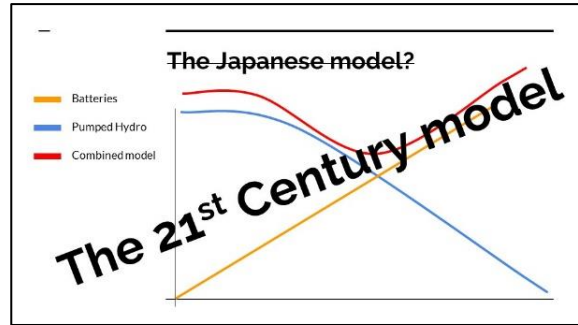
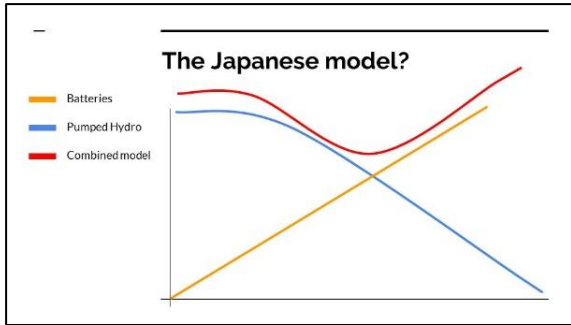
Batteries
Pumped Hydro



Cost Efficiency vs Time

Batteries
Pumped Hydro
Combined model





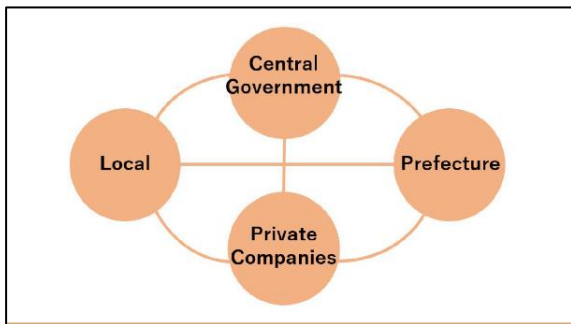
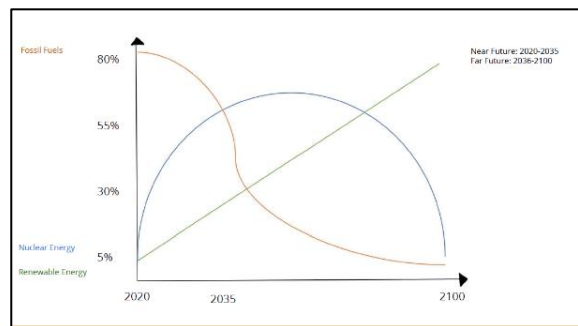
suito~yo (Group 4)

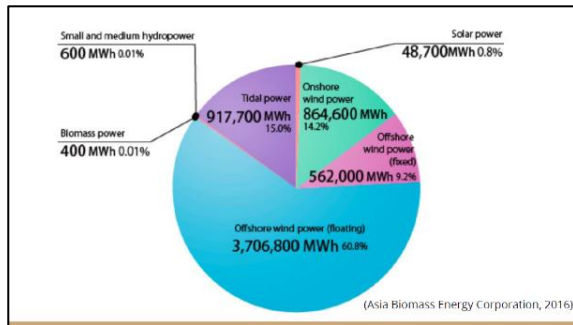
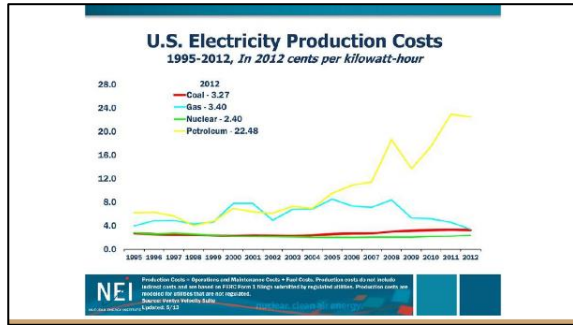
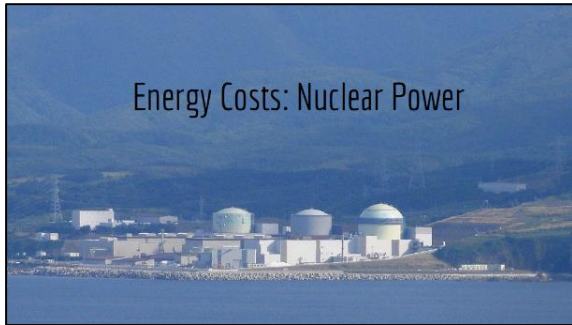
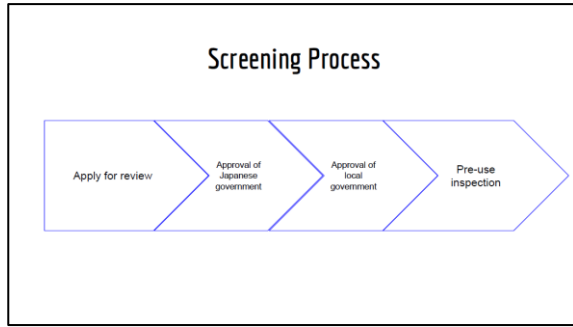
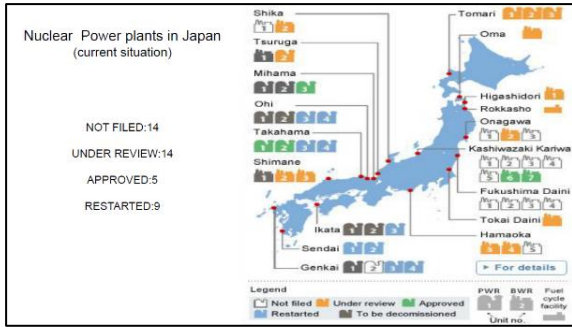
“Safety, Security and Stability: Japan's Future Energy Mix”

BOLDUC, William | CLIFFORD, Sarah | FUJIIU, Tatsuki | UEDA, Hiroko

Safety, Security and Stability:
Japan's Future Energy Mix

By Hiroko, Sarah, Tatsuki and William





Fukushima Forward Project

- Expected end: 2022
- Japan's largest floating field

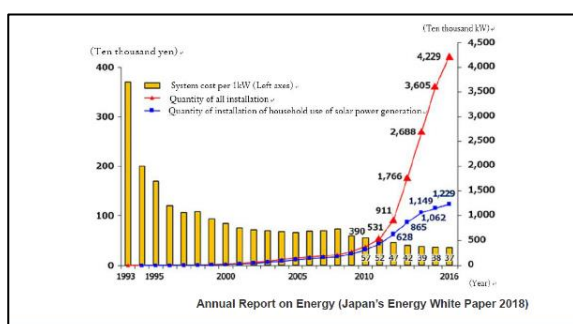
Type	Location	Distance (km)	Depth (m)	Rated (MW)	No. of WTG	Total (MW)	Start operation	
Fixed	Hokkaido	0.7	12	0.8	2	1.2	Dec.2013	
	Akita	Akita Port	0.1	2.0	1	3.0	Feb.2015	
	Yamagata	Hakata port	0.05	4	2.0	5	10.0	Jan.2014
	Ibaraki	Kamiyū	0.04	4	2.0	7	14.0	Feb.2010
	Iwate	Saizumi	-4.06	4	2.0	8	16.0	Feb.2013
	Chiba	Choshi*	3.1	12	2.4	1	2.4	Mar.2012
Floating	Fukuoka	Kita-Kyushū*	1.4	14	2.0	1	2.0	Jan.2013
	Nagasaki	Kabushikima*	1.0	100	2.0	(1)	(3.0)	Oct.2013
	Fukuoka	Fukuoka	0.0	0.0	2.0	1	2.0	Apr.2016
	Fukuoka	Iwaki city	30	120	2.0	1	2.0	Dec.2013
	Fukuoka	Naraha*	Apr.	Apr.	2.0	1 (+6.0)	(+8.0)	Dec.2016 (Mar.2016)
Total					28	89.6		

(Japan Wind Power Association, 2017)

Benefits of offshore wind energy

"If windfarms were built across all useable sites which are no further than 60km off the coast, and where coastal waters are no deeper than 60 metres, they could generate 36,000 terawatt hours of renewable electricity a year. This would easily meet the current global demand for electricity of 23,000 terawatt hours."

Ambrose, 2019



Solar power × Thermal power plant

Thermal power

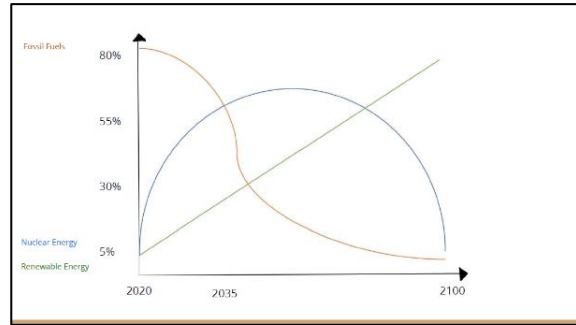
- Middle power supply- flexibly adjust the output by the power demand
- Environment friendly

=Thermal power as compensation

(Comparison of each emissions) ↓

↓	Coal ↓	Oil ↓	LNG ↓
CO ₂ ↓	100 ↓	80 ↓	60 ↓
Nitrogen oxide ↓	100 ↓	70 ↓	40 ↓
Sulfur oxide ↓	100 ↓	70 ↓	0 ↓

Reference: IEA [Natural Gas Prospects to 2010] ↓



Team Hakata Maple (Group 5)

“A 20/20 Vision for Japan’s Future Energy Mix: The Gradual Phase-Out of Coal Energy and the Revitalization of Non-Operational Sites for Clean Energy”

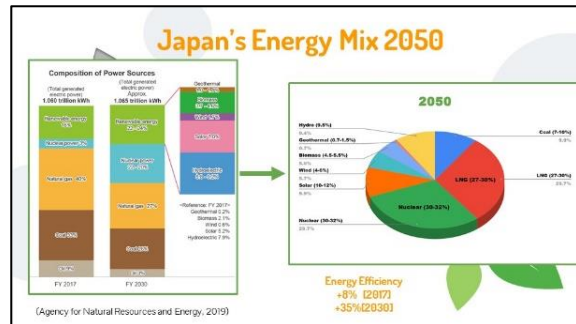
DELA CRUZ, Tadjana | KIKUCHI, Kyosuke | SAMUEL Hanisi | SHIMIZU, Nao

A 20/20 Vision for Japan’s Future Energy Mix:
The Gradual Phase-Out of Coal Energy and the Revitalization of Non-Operational Sites for Clean Energy

-Hakata Maple Protocol-

Hakata Maple
Hanisi Samuel, York University
Nao Shimizu, Meiji University
Kyosuke Kikuchi, Ritsumeikan University
Tadjana Dela Cruz, University of Regina

JACAO 2020
February 28, 2020

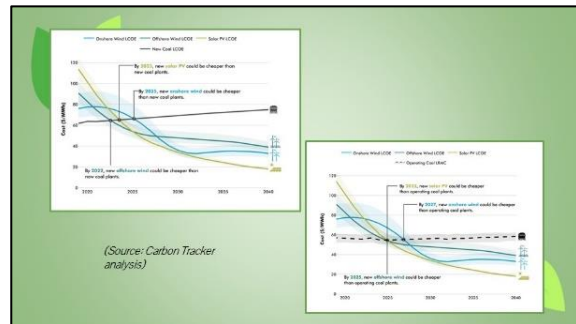


Reducing Coal Plants in Japan

Coal may become economically obsolete:

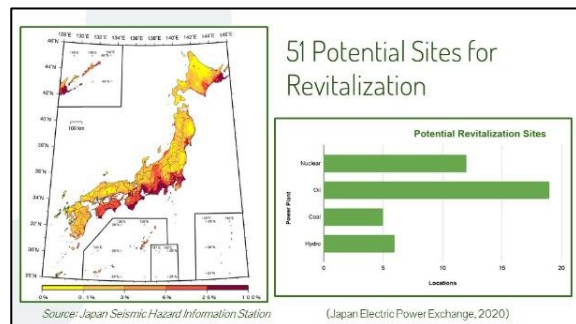
1. When new renewable energy outcompetes new or under construction coal.
2. When new renewable energy outcompetes existing coal.

Paris Agreement (Under 2°C):
Stranded Asset Risk could amount to \$71 billion USD (7.8 Trillion JPY)



123 Coal Plants
15 Under Construction
(Kiko Network)

152 Coal Plants
16 Under Construction
(Global Energy Monitor)



Coal Phase Out: Ontario, Canada Case Study

Ontario (Canada)
 Area: More than 1 million sqkm
 Population: Approx. 12.16 million (2006)
 Total Coal Power Plants: 5 (2005)

Japan
 Area: 378, 000 sqkm
 Population: Approx. 126 Million (2010)
 Total Coal Power Plants: 123 (2010)

Health Damages per year, with coal plants:
 Approx. 3 billion CAD/year (Approx. 2.49 Trillion JPY)

Cases prevented by coal Phase-out:
 660 premature deaths/year
 920 hospital admissions/year
 1,090 Emergency Room visits/year
 331,000 minor illness cases/year

Nuclear Energy Dilemma

Supporters of Nuclear Energy

- Low CO₂ emissions and more environmentally friendly than fossil fuels.
- It is cheaper to generate electricity from nuclear. Statistically safer than any other fuel or hydropower generation.
- Provides stable baseload energy generation.

Critics of Nuclear Energy

- Safety and health concerns.
- Massive cost of constructing nuclear power plants.
- No proper waste storage.

Reintroducing Nuclear Energy

Implementation:

- Educational campaigns for Nuclear Energy to regain public trust in inspection authorities.
- Develop a repository location for nuclear waste with consent and proper consultation of community.
- Restart former nuclear reactors and build new nuclear power plants.

Energy stability	Economic efficiency	Environment	Safety
○	○	○	○

Japan's Nuclear Reactor fleet

Current status of Japan's nuclear reactor fleet, November 2019

Legend:
 ■ Pressurized water reactor
 ○ Boiling water reactor

Permanently shutdown post-Fukushima:
 ■ 1st class application under NISA review
 ■ 2nd class application under NISA review
 ■ 3rd class application approved by NISA
 ■ Operating reactor

Only five nuclear reactors has been restarted by the government since the Fukushima Daiichi nuclear disaster.

Increase Wind Energy in Japan

Implementations:

- Reusing former coal plants to serve as offshore wind hubs.
- Install more onshore wind turbines.
- Floating wind turbines.

Energy stability	Economic efficiency	Environment	Safety
X	X	○	○

Solar PV Power

Implementation:

- Lower the system and generation costs
- Improve the grid and develop storage for extra electricity
- Reduce risk through environment assessments

Energy stability	Economic efficiency	Environment	Safety
X	△	○	○

< PV for Utilities >

Average System Cost: ¥286000 (2018) → ¥100000 (2030)

Generation Cost: ¥18/kWh (2018) → ¥8.5/kWh (2030)

Source: Agency of Natural Resource and Energy (2018)

< PV for Residence >

Average System Cost: ¥341000 (2018) → ¥200000 (2030)

Generation Cost: ¥24/kWh (2018) → ¥10.3/kWh (2030)

Source: Agency of Natural Resource and Energy (2018)


What can we do with extra electricity?

- Maximize the capability of the electric grid.
- Sell extra electricity in the market to other parts of Japan.
- Utilize future storage capture technology for utilities.

What can we do to mitigate negative impacts?

- Environment assessments.
- Reduce the reflection of sunlight with new technologies (non-reflective coating).


Creating Solar Farms from Former Sites



- Prevents additional deforestation.
- Reuses stable land.
- Easier to acquire consent from local community.
- Distance from residential areas prevents reflection.

<Mega Solar Omuta in Fukuoka (メガソーラー大牟田)>

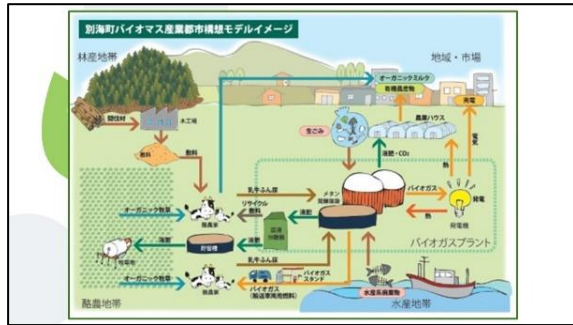
Solidifying the Position of Biomass Energy



Implementation:

- Encourage and promote biomass energy generation.
- Develop better systems for biomass energy.
- Revitalize rural communities with biomass opportunity.

3	Energy stability	Economic efficiency	Environment	Safety
E	X	X	O	O
+				
S				



Balanced Energy Mix



ありがとう！
Merci Beaucoup!
Thank you!

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Japan's Recent Public Opinion: Survey on Nuclear Energy: Support Rates Somewhat For Restarting Npps

Team 1 and only (Group 1)

“An Energy Plan and Solution for 2030”

KURIYAMA, Maho | MINE, Yuki | ROURKE, Serena | THEUERKAUF, David

Canada's Energy Frontier Planning for 2030

Current energy mix → 2030 energy mix proposal → Transitioning to 2030 mix → Guiding principles for 2050

Team 1 (and Only)
Maho Kuriyama, Yuki Mine, Serena Rourke, David Theuerkauf

1/13

Electricity as Canada's Energy Future

Canadian Energy Production

29,331 PJ / 8,147.5 TWh

2020/5/21 2/13

Current and future Projections

2017 Energy Mix: 1785 PJ / 495 TWh

2030 Energy Mix: 1900 PJ / 528 TWh

2020/5/21 3/13

Questions Identified

- How can we make hydro power more sustainable?
- How can we reduce fossil fuels, particularly in Alberta?
- How can we improve the stability of other low-carbon energies?

"With Canada's head start on clean power, it can complete the transformation to a nearly carbon-free electricity grid more easily than many places."

Generation Energy Council Report

2020/5/21 4/13

The current hydro situation

- Economic:** Relatively Low LCoE (Green checkmark)
- Social:** Strong Resistance from Indigenous (Red X)
- Environmental:** Negative Ecological Effects (Red X)

2020/5/21 5/13

Kivalliq hydro-fiber link

- Economic:** Provides jobs to local communities
- Social:** Values align with Indigenous engagement
- Environmental:** Reduces impact and emissions

Notable federal funding channels:

- National Energy Board
- Program of Energy Research and Development
- Canada Infrastructure Bank
- NSRFRC

2020/5/21 6/13

Alberta's Role in Coal Elimination

Pan-Canadian Framework in Clean Growth and Climate Change commitments by 2030 include:

- Nationwide phaseout of coal
- An established net-zero energy building code
- Cleaner and less emitting oil and gas production
- A more diverse mix of oil and gas products and services

The three principles of Canadian energy policy:

- Market orientation
- Respect for jurisdictional authority
- Tariffed inter-province (when necessary)

2020/5/21 7/13

Alberta's RE Potential: Fossil Fuels to Geothermal

"If [geothermal energy] every really takes off on a large scale in Canada, it will be because of oil and gas."

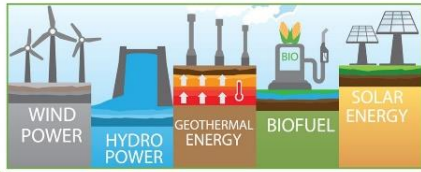
- Davy Nelson, Hinton City Councillor

Benefits to Canadians:

- Energy
- Environment
- Health
- Quality of Life
- Jobs
- Income
- Equity

2020/5/21 8/13

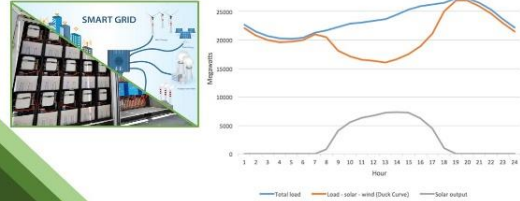
Renewable Energy Potential



2020/9/21

9/13

RE - Instability

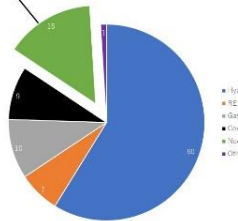


2020/9/21

10/13

How to make nuclear sustainable

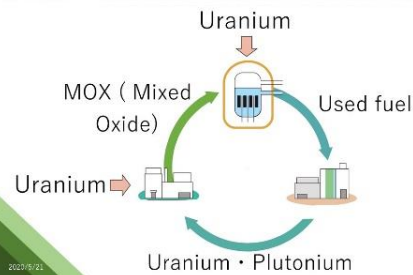
2nd Largest Electricity Producer



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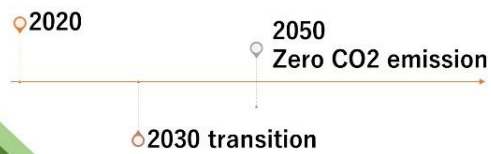
Nuclear Potential: Plutermal Generation



2020/9/21

12/13

Future Guiding Principles



2020/9/21

13/13

Thank You
ご清聴ありがとうございました

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2020/9/21

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Forces of Nature, 9 to 5 (Group 3)

“A Green Plan For A More Inclusive Canada”

COURCHESNE, Sophie | ISHIGAMI, Chieka | KAWAUCHI, Mio | LI, Ruizhe

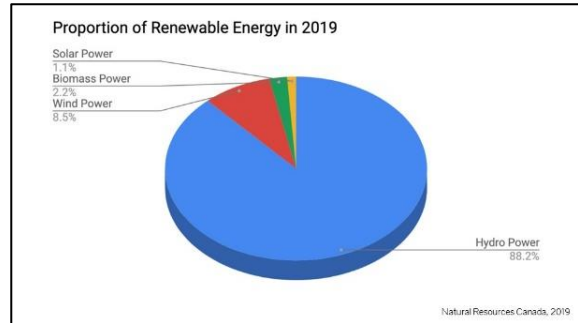


Introduction

Climate Change
Greenhouse Gas Emissions
 2017: Emissions with First Nations and Environmental groups growing faster than national average
 Very profitable in Canada and growing faster than total number of jobs

Assumptions

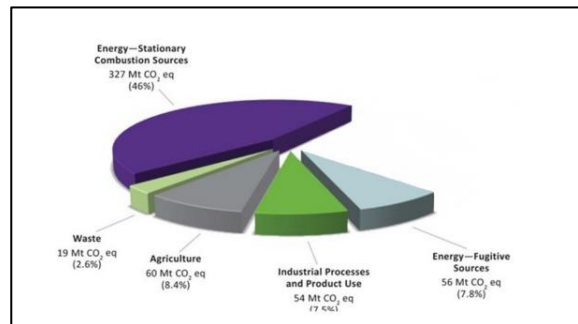
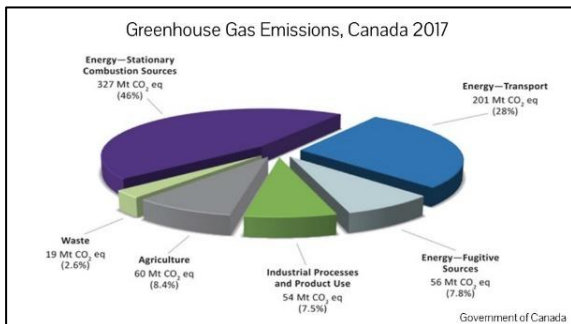
- Self-sufficiency
- New Tech
- Pipeline Projects



How to Increase Efficiency?

- Solar
 - Bifacial
 - Batteries

Electric Vehicles

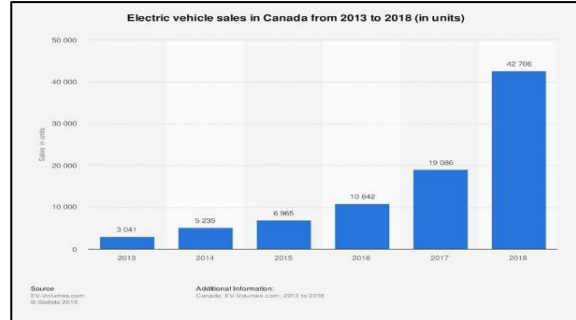


Canadian Government Support

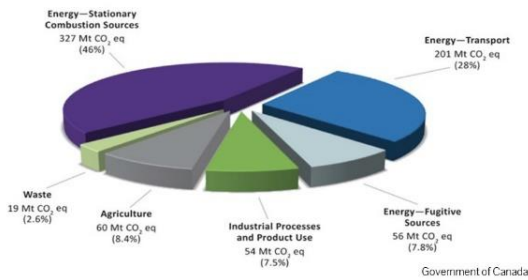


- **100% tax writeoff** when purchasing vehicles up to \$55,000 CAD
- **5,000 CAD** incentive for long range EV or hybrid vehicles.
- **2,500 CAD** incentive for short range EV or hybrid vehicles.

- Transport Canada



Greenhouse Gas Emissions, Canada 2017

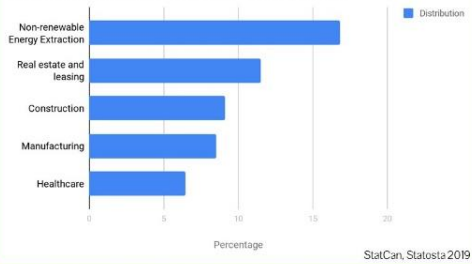


Training Talents

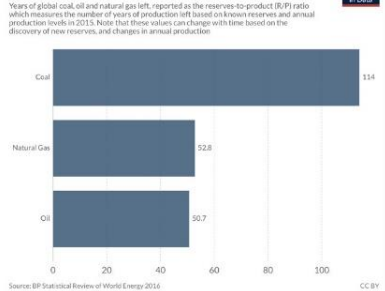
The secret formula behind renewable energy industry growth.

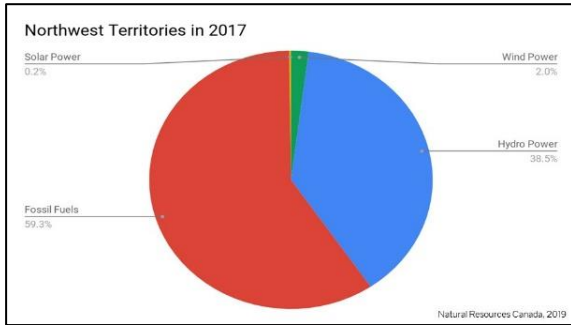
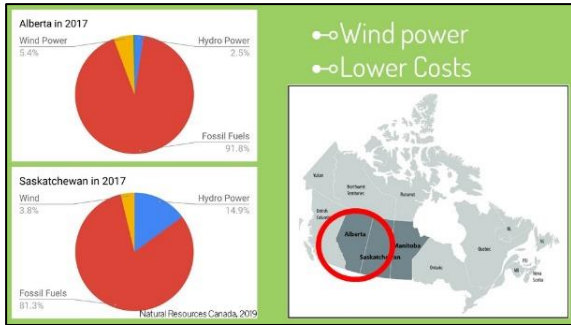
Albertans' jobs are dependent on non-renewable energy export.

Top 5 Industries in Alberta by GDP Percentage, 2018



Years of fossil fuel reserves left





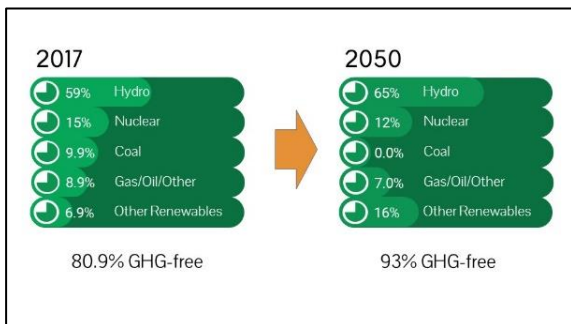
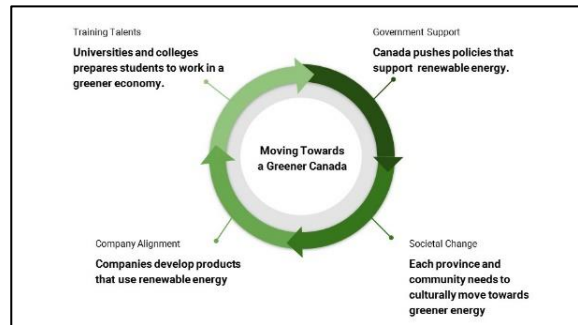
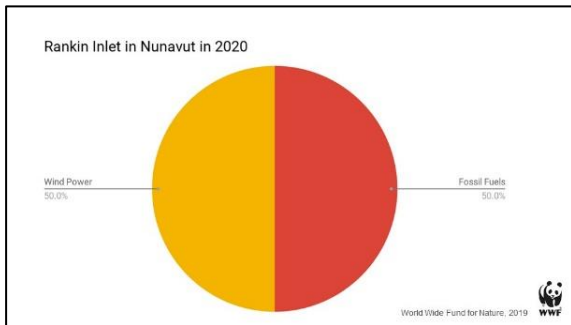
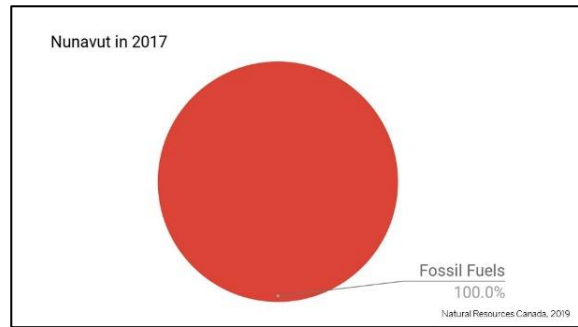
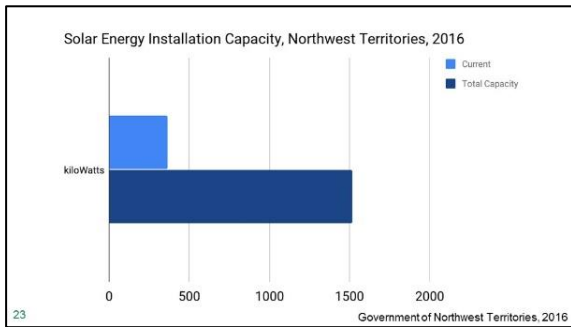
Wind Power

- Successfully installed 9.2 megawatts wind turbines in 2013

Solar Power

- Amount installed increased by 1,700% from 2009 to 2016
- Cost decreased by 50% since 2010

21



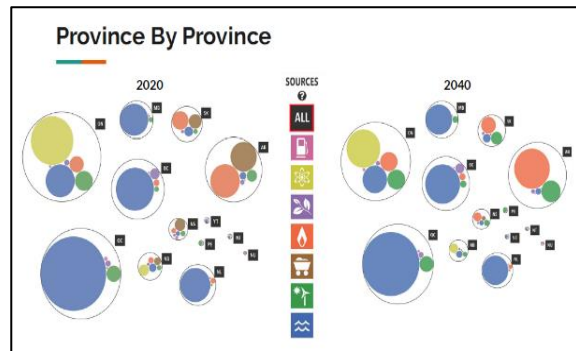
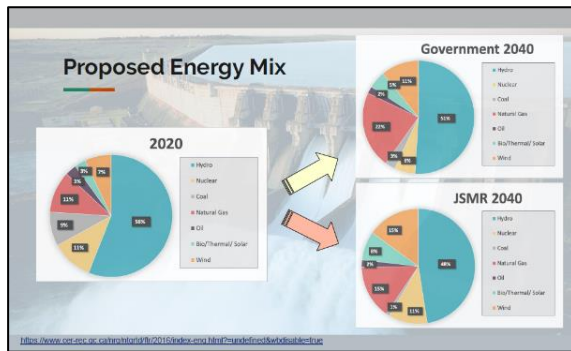
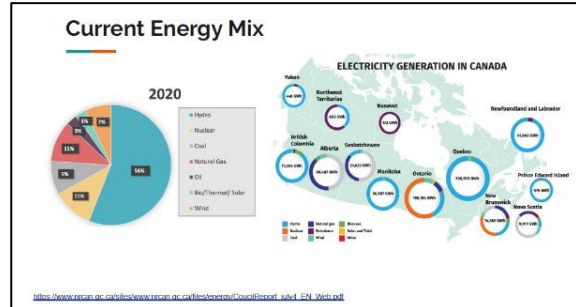
JSMR (Group 2)

“Towards a Sustainable 2040 Canadian Energy Mix”

LI, Jessica | LOSIER-TREMBLAY, Simon | TAKAHASHI, Mona | TEMMA, Rena

Towards a Sustainable 2040 Canadian Energy Mix

Group 2 (JSMR) Jessica Li
Simon Losier-Tremblay
Mona Takahashi
Rena Temma

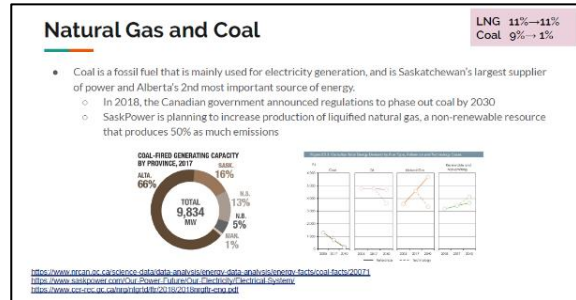


Fossil Fuels & the Paris Agreement

- Canada is the fourth largest oil producer and exporter in the world
- The Alberta oil sands account for 11% of Canadian GHG emissions and 0.1% of global GHG emissions
- Under the Paris Agreement, Canada has committed to reducing GHG emissions by 30% below 2005 levels

https://www.nrcan.gc.ca/science_data/data_analysis/energy_data_analysis/energy_factsheet/factsheet_2007/

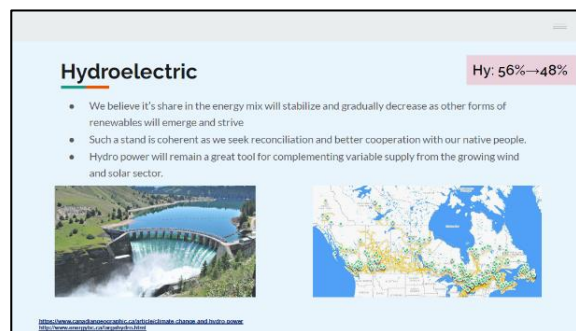
<https://www.canada.ca/en/environment-climate-change/services/paris-climate-agreement.html>



Wind, Solar and Other Renewables

- Wind energy is now the most cost competitive option for new electricity generation
- Solar power will benefit from smarter grids and digital energy management.
- New economic and cooperative opportunities to reinforce our relationship with native communities and maintain strong employment in the energy sector


https://www.ec.gc.ca/science_data/data_analysis/energy_data_analysis/energy_factsheet/factsheet_2007/



Nuclear Energy

Nuc: 11% → 11%

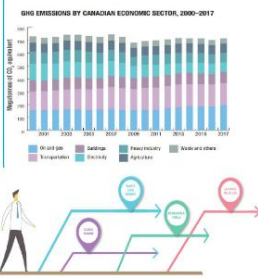
- Currently, nuclear power plants are only operating in Ontario and New Brunswick, but many provinces have investigated the feasibility of building more (e.g. Alberta, Saskatchewan)
 - Nuclear has replaced coal as the baseload energy source in Ontario
- In 2013, Ontario deferred the construction of two new plants, but plans to continue operating current plants until 2060
- Small modular reactors (SMRs) may offer a way to bypass traditional financial and construction limitations



<https://www.ontario.ca/energy/nuclear/2011/01/01/ontario-nuclear-energy.html>

What Lies Ahead?

- Only 20% of our GHGs emissions originate from electricity generation
- A comprehensive energy transition will require 4 major keys
- Leading the way




2-6. Field Trip

Participants were supposed to visit Asakusa area, Tokyo to see a famous Kaminari-mon Gate, Nakamise shopping street and Senso-ji Temple in the morning. However, due to the rapidly growing concerns against the coronavirus situation, we canceled the field trip and advised students to go for sightseeing not with a large number of group but individually.

2-7. Final Report

At the end of the forum, participants wrote a final reflection addressing the following:

1. How has participation in the forum changed your motivation to study and/or provided you with new insights?
2. How was the experience throughout the program?
3. What was most impressive about this program?
4. How has this program influenced your career outlook?
5. Other comments

3. SURVEY ON THE FORUM

3-1. Survey Overview

An online survey was conducted by the organizing committee to get student evaluations on the forum and contribute to the improvement in the quality of future forums. The overview of the survey is as follows:

- Title:** JACAC Student Forum 2020 Participants Survey
- Objective:** To get student evaluations on the forum and improve the quality of the future forums.
- Respondents:** 20 (out of total of 24)
- Period:** March 23 (Mon) – 27 (Fri), 2020

The survey was conducted through Google Forms, an online data collection tool.

3-2. Survey Results

Survey results are summarized below, in tables for each question as appropriate.

Q3: How do you rate the following arrangements made by the organizers:

Table 1: Student Ratings of Arrangements							
Responses	Outstanding	Above Average	Average	Below Average	Poor	N/A	Total Respondents
Pre-departure Information	10 (50%)	6 (30%)	3 (15%)	0 (0%)	1 (5%)	0 (0%)	20 (100%)
Flight Arrangements	12 (60%)	5 (25%)	2 (10%)	1 (5%)	0 (0%)	0 (0%)	20 (100%)
Accommodations	11 (55%)	7 (35%)	1 (5%)	1 (5%)	0 (0%)	0 (0%)	20 (100%)
Forum Venues	14 (70%)	4 (20%)	2 (10%)	0 (0%)	0 (0%)	0 (0%)	20 (100%)
Field Trip	9 (45%)	8 (40%)	3 (15%)	0 (0%)	0 (0%)	0 (0%)	20 (100%)
Meals	3 (15%)	5 (25%)	8 (40%)	2 (10%)	0 (0%)	2 (10%)	20 (100%)

Q4: Please rate the following aspects of the JACAC Student Forum:

Table 2: Student Ratings of Educational Activities							
Responses	Outstanding	Above Average	Average	Below Average	Poor	N/A	Total Respondents
Pre-departure Assignment and Discussions	5 (25%)	8 (40%)	6 (30%)	1 (5%)	0 (0%)	0 (0%)	20 (100%)
Lectures	8 (40%)	9 (45%)	3 (15%)	0 (0%)	0 (0%)	0 (0%)	20 (100%)
Panel Discussions	7 (35%)	9 (45%)	4 (20%)	0 (0%)	0 (0%)	0 (0%)	20 (100%)
Group Presentations	16 (80%)	3 (15%)	1 (5%)	0 (0%)	0 (0%)	0 (0%)	20 (100%)
Closing Ceremony and Reception	15 (75%)	4 (20%)	1 (5%)	0 (0%)	0 (0%)	0 (0%)	20 (100%)
Interaction/Communication with other students	14 (70%)	6 (30%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	20 (100%)
Saturday Orientation	9 (45%)	4 (20%)	7 (35%)	0 (0%)	0 (0%)	0 (0%)	20 (100%)

Q5: Please rate the difficulty of conducting the student presentations:

Table 3: Student Ratings of Presentation Difficulty				
Extremely Easy	Fairly Easy	Average	Fairly Difficult	Extremely Difficult
1	2	6	10	1
5%	10%	30%	50%	5%

Q6: Please let us know what you liked most about the JACAC Student Forum:

- *I felt that it was very well organized and I greatly appreciated that. In comparison to last year's forum this was much less stressful and easier to participate in. So thank you. I really enjoyed the field trip though - this was my favourite part of the whole experience.*
- *Making new friends!*
- *The project itself (presentation)*
- *Getting to know Japanese students in an intimate way.*
- *Meeting all the other students*
- *Interactions and discussions between both between Canada-Japan, but also between Canadian students. This year's theme was very broad, so discussions could last for a very long time.*
- *Both of Mr. Winkler's sessions are wonderful even though the contents are based on basic information. I didn't get bored at that time. I talked to him by Japanese by asking the questions. Next time I promise you to ask by English or Germany.*
- *Final presentation at Canada embassy*
- *The fact that we had time to get to know other students apart from our group and had time to explore around the neighborhood.*
- *Field trip*
- *I liked group work the most. I liked that we can choose the place for our group work.*

- *Creating wonderful memories with my group members and fellow students.*
- *Everything but doing group work with wonderful students.*
- *Creating presentation with group members for one week*
- *I really like the topic this year. Many discussions were held so it was great to hear other people's thoughts.*
- *The work environment and the desire to learn.*
- *The organization of the program was seamless and allowed us to focus on the wonderful interactions with our peers.*
- *I could communicate with a lot of students, not only Japanese students, but also with the Canadian students. This was very exciting for me, and I gained a lot of important things through this interaction.*

Q7: Please let us know what you liked least about the JACAC Student Forum:

- *n/a. It was well run.*
- *Nothing really that I didn't like.*
- *The time constraints*
- *Going to Lawson for lunch every day.*
- *Having to say goodbye*
- *I think the forum was flawless overall. Maybe the orientation was done too quickly since I was extremely tired of the planes and the lack of sleep, so I was concentrated enough to hear everything.*
- *The problem is that there are only few times to discuss the action plan with Canadian students.*
- *Accommodation in Tokyo*
- *There were a few times to ask questions to professors.*
- *Nothing.*
- *I would say if the lecture materials were shared before the forum, it would help especially Japanese students to understand the contents. It was actually tough to comprehend every each of lecture. Also, we had lecture on the bus, but we rarely hear the lecture's voice and couldn't understand.*
- *Coronavirus*
- *It was a little short.*
- *Some students were not prepared on the issue which made group work difficult.*
- *Food during orientation could have been more substantial considering we had only just arrived so we didn't have time to get anything else. Other than that, everything was great!*
- *The second hotel(hostel) was very small for me.*

Q8: If you have any suggestions on how the JACAC Student Forum can be improved in the future, or how the JACAC network can be expanded/strengthened, please let us know below:

- *I think it is great to continue encouraging alumni participation because it shows the current participants how much this experience can help them grow.*
- *Introduce students to each other.*

- *Make it longer*
- *Do some activities with the students (those not participating in the forum officially) of the university of the forum. It could diversify the activities, as well as make publicity and let people know about the forum.*
- *Please make more meeting time for us.*
- *I think the reception was a very good opportunity to connect participants of that year and alumni of the forum. I hope JACAC have the reception every year.*
- *The information about the scholarship could be better explained. I thought the 80,000 yen was for a deposit that would be reimbursed as a scholarship through our university, not that we would receive the money in person. I exchanged spending money for the trip before receiving a clarification email about the scholarship.*
- *My friends at Meiji University didn't know about JACAC, thus, it might be better to inform this at each University by having presentation.*
- *Showing the criteria more clearly*
- *More interactive lectures? But truly it was an amazing experience as is.*
- *Double room was OK, but I wanted the place which has more comfortable personal space.*

Q9: What would you like to see covered as a potential forum theme in future years:

- *Global health as securitized. The politics of pandemics.*
- *The Olympics!*
- *Bridging the inequality gap (rich and poor)*
- *World Trade*
- *How to best utilize AI (most economic growth, least job loss)*
- *International law problems (such as international penal courts, etc), environment issues, native/indigenous issues, energy issues (being more precise, as this year's theme was very broad).*
- *Corona Virus-How the world should respond when faced with major problems?*
- *Digital Society - How can we survive the digital society?*
- *MOOC - How can we design new education for new generation?*
- *About education system (cooperation)*
- *Topics related to mental health - this is something very common in the world but is not been discussed very openly.*
- *Micro plastic issue*
- *related to Sustainable Development Goals*
- *How can we make the better working condition or environment?*
- *Poverty (?)*
- *Immigration policy*
- *Something related to the pandemic that is currently happening now.*
- *The media industry, inequalities, african development, education affordability*
- *Migration? ASEAN relations?*

- *The relationships between Japan and Canada (How to keep, maintain the better relationships between these two countries for the future)*

Q10: Do you want to Participate in JACAC programs (Student Forum/Exchange programs):

Q11: For Japanese students, did your interest in Canada increase? For Canadian students, did your interest in Japan increase?

Q12: do you want to pursue a graduate degree?

Table 4: JACAC Forum Impact on Students						
	Q10		Q11		Q12	
	N	%	N	%	N	%
Yes	20	100%	19	95%	17	85%
No	0	0%	1	5%	3	15%

Q13: Please include any additional comments:

- *I think that this definitely helped me open doors to different kinds of education and understanding the world. Thank you again! Arigato gozaimashita!*
- *The staff, participants and lectures were all memorable and I deeply appreciated the experience. If I could, I would participate again without hesitation. The amount of efforts put into this project was immense and I hope it goes a long way.*
- *Thank you so much for wonderful time.*
- *Thank you for the wonderful experience and all your hard work! The organization and the lectures were superb.*
- *It was amazing to participate in this forum. I really enjoyed discussing with Canadian students and had a lot of fun being with them for that long time. Thank you very much for organizing this forum. I'll definitely apply this again though I'm not sure if I am qualified.*
- *My experience has made think of pursuing an international career in Asia. I have even looked into universities in Japan and other parts of Asia where I can pursue a graduate degree.*
- *Thank you for organizing this amazing experience.*
- *This experience gave me many important things for the future life. I want to keep this precious experience.*

3-3. Survey Summary

The 11th Annual JACAC Student Forum had an overwhelmingly positive impact on the student participants, with 100% of the students expressing interest in further participation in JACAC programs, and 95% of the students gaining interest in Japan and Canada (Table 4). Written responses for question

6 (what you liked most), 7 (what you liked least), and 8 (Areas for improvement) can be categorized in tables 5 through 7. Suggestions by the respondents for future forum themes were not categorized as most were unique suggestions.

The academic aspects of the forum were well received, with the majority of responses for every aspect being at least “above average” (Table 2). It seems there are not any remarkable factors that caused dissatisfaction (Table 7). However, as with the previous forums, the respondents found the final presentation to be difficult (Table 3).

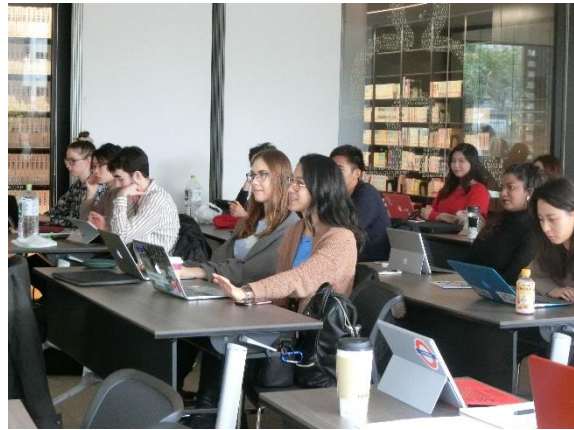
The most frequent suggestion was to incorporate more interaction with other students/alumni (Table 7). Nevertheless, the majority of respondents appreciated the forum environment which allowed interaction with other students coming from diverse backgrounds (Table 5). However, this has been consistent with previous JACAC forums, and as the previous forum reports have noted, satisfaction with interaction with other students is common in global events and is thus not unique to the JACAC forum, leaving room for improvements to be made for future programs.

Table 5: Student Satisfaction Summary (Q6)		
What you liked most:	N	%
Discussion/Interaction with other students	8	40%
Group Work	2	10%
Presentations	3	15%
Lectures	1	5%
Field Trip	2	10%
Topic	1	5%
Other	1	5%
No answer	2	10%

Table 6: Student Dissatisfaction Summary (Q7)		
What you liked least:	N	%
Group Work	2	10%
Timeline/scheduling	2	10%
Lectures	2	10%
Meal	2	10%
Accommodation	2	10%
Orientation	1	5%
Coronavirus	1	5%
Nothing	4	20%
No answer	4	20%

Table 7: Suggestions for Future Forums (Q8)		
Suggestions:	N	%
Interaction with other students/alumni	4	20%
Timeline/scheduling	2	10%
Interactive lectures	1	5%
More clear criteria	1	5%
Pre-Information (Scholarship)	1	5%
Accommodation	1	5%
Advertising	1	5%
No answer	9	45%

PHOTOGRAPHS



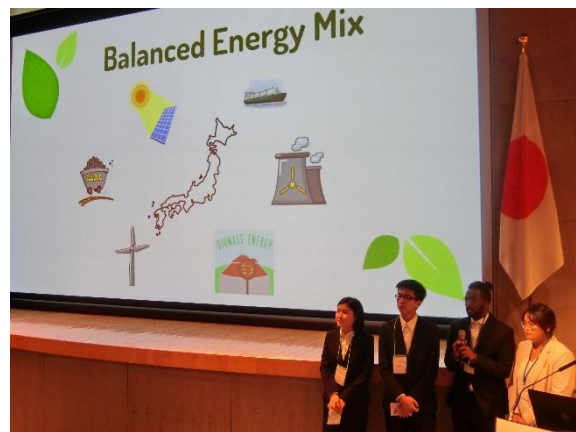
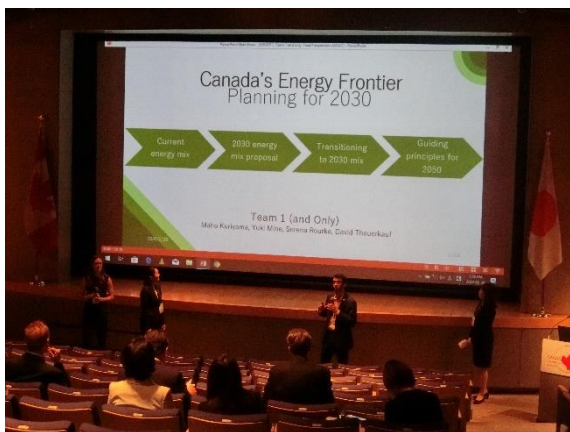
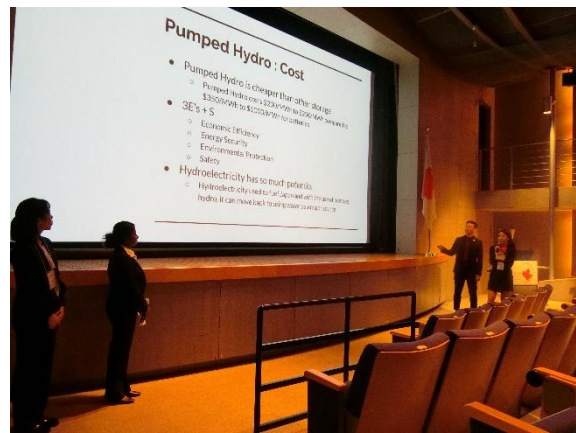
Lectures



Group Work



Field Trip



Presentations



Participants of the 11th Annual JACAC Student Forum
with Her Imperial Highness Princess Takamado

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