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2019-2020 Editorial Board

CANADA-UNITED STATES LAW INSTITUTE

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CANADA-UNITED STATES LAW JOURNAL

VOLUME 44

PROCEEDINGS OF THE 43RD CUSLI ANNUAL CONFERENCE ON THE STATE OF OUR NATIONS: COOPERATING ON CLIMATE CHANGE

2019 CANADA-UNITED STATES LAW INSTITUTE DISTINGUISHED LECTURE

ARTICLES

PROCEEDINGS OF THE 43RD CANADA-UNITED STATES LAW INSTITUTE ANNUAL CONFERENCE: CAN THE UNITED STATES AND CANADA COOPERATE ON CLIMATE CHANGE?

MARCH 21-22, 2019

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The Hon. James J. Blanchard
Partner and Chair Emeritus, Government Affairs Practice Group
Former Governor of Michigan
U.S. Representative
U.S. Ambassador to Canada

Governor James Blanchard joined DLA Piper upon the conclusion of his duties as United States ambassador to Canada in April 1996. In recognition of his outstanding performance as ambassador, Secretary of State Warren Christopher presented Governor Blanchard with the Foreign Affairs Award for Public Service in a ceremony at the Department of State, making him one of only a handful of ambassadors to receive this prestigious award. James was named ambassador to Canada in May 1993, after serving two terms as governor of Michigan (1983 – 1991) and four terms as a member of the United States Congress (1975 – 1983). In 1992, he chaired President Bill Clinton's successful campaign in Michigan. Governor Blanchard is also former chairman of the Democratic Governors

Association and the National Democratic Platform Committee, as well as a former member of the National Governors Association's executive committee. Prior to his election to Congress, from 1969 to 1974 Governor Blanchard was assistant attorney general of Michigan.

Chios Carmody
Associate Professor, Western University Faculty of Law
Canadian National Director, Canada-United States Law Institute

Chi Carmody has taught at the University of Western Ontario Faculty Of Law since 1999, where he teaches courses in public international law, international trade law and international business transactions. He also serves as Canadian Director of the Canada-United States Law Institute. He has been a visiting professor at Georgetown University Law Center and an Emile Noël Fellow at the Jean Monnet Center for Regional and International Economic Law & Justice, NYU Law School. He received his LL.B. (Ottawa), LL.M. (Michigan), S.J.D. (Georgetown), and is a member of the Bars of Ontario and New York.

Joseph Comartin
Consul General of Canada in Detroit

As the Consul General of Canada in Detroit, Comartin is responsible for the States of Michigan, Ohio, Kentucky and Indiana. Comartin is a Canadian lawyer and politician. Comartin joined the New Democratic Party in 1969 and represented the party in the House of Commons of Canada from 2000 to 2015. A civil litigation lawyer based in Windsor, Ontario, Comartin enjoyed strong support from local union members when he ran for a seat in the House of Commons. He won the seat in the 2000 election. He was re-elected in 2004, 2006, 2008, and 2011. He was the Opposition House Leader from October 18, 2011 to April 19, 2012.

Richard O. Cunningham
Partner, Steptoe & Johnson LLP

Dick Cunningham has been recognized for more than 40 years as one of America's leading international trade lawyers. His practice includes the handling of antidumping and countervailing duty cases for both petitioning US industries and respondent exporters and governments, as well as advising corporate and governmental clients in trade negotiations and other trade policy matters. Dick also litigated some of the most significant WTO dispute settlement cases. Dick has helped numerous US and foreign companies develop and implement international trade strategies to overcome market access barriers, to use US and international trade laws to address competitiveness issues, to maximize the benefits of intellectual property rights and to obtain assistance (including relief from imports) in competing with international rivals.

Marc DeBlois
Senior Advisor, Ministère de l'Environnement et de la Lutte contre les changements climatiques / Ministry of the Environment and the Fight against climate change
Co-Chair, Climate Change Steering Committee of the Coalition of the New England Governors and Eastern Canadian Premiers

M. Marc DeBlois, a native of Québec City, holds a Baccalaureate in Geography from Laval University and a Master's degree in Geography and Remote Sensing from the University of Sherbrooke. Marc worked for a forestry consulting firm for six years using his remote sensing expertise to help forest companies before joining Québec's government. In 2000, he joined the Ministry of the Environment, Wildlife, and Parks, and although the Ministry has changed names over times, he has maintained a strong interest in climate change issues. Currently, M. DeBlois works in the Section for International and Canadian Relations. In this capacity, Marc oversaw the creation of the regional Climate Change Plan of the Conference of New England Governors and Eastern Canadian Premiers (NEG-ECP) in 2000. Since 2006, he has been co-Chair of the Climate Change Steering Committee, which is responsible for implementing the plan. Since 2008, he also has been a member of the NEG-ECP Transportation and Air Quality Committee, responsible for implementing the regional Transportation and Air Quality Action Plan, the offspring of the regional Climate Action Plan. Marc has particular expertise on the NEG-ECP Climate Change Action Plan and how a similar climate change plan could be considered in the Great Lakes region.

Martha Hall Findlay
President and CEO, Canada West Foundation
Member, Minister of International Trade's Trade Expert Advisory Council
Former Member of Parliament

Martha Hall Findlay is President and CEO of the Canada West Foundation, an independent, non-partisan public policy think tank that focuses on the policies that shape the West, and by extension, Canada. Through evidence-based research and commentary, the Canada West Foundation provides practical solutions to tough public policy challenges at home and on the global stage. As a corporate lawyer, senior business executive and successful entrepreneur, Martha has more than 25 years of domestic and international experience with major multinationals as well as start-ups, primarily in telecommunications and technology. She was a Member of Parliament from 2008 to 2011, serving in several capacities in the Shadow Cabinet, and as a member of the House of Commons Standing Committees for Finance; Transport, Infrastructure and Communities; Government Operations; and International Trade. She is currently a member of the Minister of International Trade's Trade Expert Advisory Council.

Mark Fisher
CEO, Council of the Great Lakes Region

Mark Fisher was appointed Chief Executive Officer of the Council of the Great Lakes by the Council's board in 2014. Mark is a seasoned professional with 13 years of experience in policy-making, strategic business planning, corporate communications, stakeholder engagement, public advocacy, and issues management. He brings a wealth of experience in international affairs, with a focus on advancing the United States-Canada relationship in the areas of trade, security, natural resource development and environmental protection. He also brings extensive experience providing advice to key decision-makers and influencers, including the Prime Minister of Canada, provincial premiers and ministers, parliamentarians, and C-level executives from the private and not-for-profit sectors.

Terrance J. Fitzpatrick
President and CEO, Energy Association of Pennsylvania

From 1999 to 2007, he was a Commissioner of the Pennsylvania Public Utility Commission, serving as Chairman from 2003 to 2004. From 1995 to 1997, he served as Counsel to the Environmental Resources and Energy Committee in the Senate of Pennsylvania, and helped to draft Pennsylvania's electricity competition law. During his career, he has also served as legal counsel with the PUC, with the Insurance Department, with two private law firms, and with the Electric Power Generation Association. He has authored articles on administrative law and energy topics, and a white paper on improving infrastructure in Pennsylvania.

The Hon. John Godfrey
John Godfrey Climate Change Consulting
Former Member of Parliament
Former Special Advisor for Climate Change and Chair, Climate Action Group

John Godfrey has had an extensive and accomplished career dedicated to public service that spans over 30 years. He was first elected to the federal House of Commons as the Member of Parliament for Don Valley West in 1993. He was re-elected four times, holding the position until 2008. From 2003-04, Godfrey was the parliamentary secretary to the prime minister and from 2004-06, he served in cabinet as Minister of State for Infrastructure and Communities. In that role, he was responsible for overseeing the distribution of $5.6 billion for strategic, municipal, rural and border infrastructure programs. Mr. Godfrey also oversaw pioneering policy regimes related to climate change. Prior to being elected to Parliament, Godfrey served as vice-president of the Canadian Institute for Advanced Research. He was also editor of the Financial Post for four years and spent 14 years in academia, holding various positions at the University of Kings College, including associate professor, president and vice-chancellor.

Grant Goodrich
Director, Great Lakes Energy Institute on CWRU

Grant Goodrich is a nonprofit organization leader with a passion for the environment and public service, and for making Northeast Ohio a great place to live, work, and raise a family. A decorated veteran of the U.S Marine Corps with a deployment to Iraq, Grant served for fourteen years as an infantry officer and Foreign Affairs specialist. He is a graduate of the U.S. Naval Academy and of U.S. Marine Corps Command and Staff College. He is an Olmsted Scholar, and studied international relations in Slovenia. Grant received his MPA degree in Environmental Science and Policy from Columbia University in New York. Grant is currently the Director of the Great Lakes Energy Institute at Case Western Reserve University, where he works to grow the energy-related research efforts of the University. Previously, Grant led efforts to attract and grow businesses in Greater Cleveland while serving as the interim CEO of Team NEO. Earlier, he managed the international research projects of the Earth Institute at Columbia University.

Lawrence L. Herman
Herman & Associates

Lawrence L. Herman is a graduate of the University of Saskatchewan (B.A., 1966) and the University of Toronto Law Faculty (1969). After being called to the Bar in 1970, he served in the Canadian Foreign Service in the 1970's in a variety of posts, at the United Nations in Geneva and in Ottawa, representing Canada in numerous international conferences and meetings, including the GATT, OECD and the UN Conference on the Law of the Sea. Prior leaving the External Affairs Department in 1980, he was the head of the Department's Economic and Treaty Law Section in the Legal Bureau. In private law practice, Mr. Herman appeared on behalf of Canada in the International Court of Justice in the Gulf of Maine boundary case in 1984.

For many years, he has concentrated his legal practice on international trade and business transactions, representing private sector clients, governments and international agencies, dealing particularly with the GATT/WTO, FTA and NAFTA (where he acts as counsel before dispute-resolution bodies). He regularly represents clients at the Canadian International Trade Tribunal (CITT), in the courts and before Parliamentary committees.

Mr. Herman is Chair of the CITT's National Advisory Committee and a member of the Trade Expert Advisory Council of the Canadian Department of International Trade. He had been a member of the Market Access Advisory Group (MAAG) of the International Trade Department providing advice on business issues in the WTO Doha Round negotiations. He has been a member the Executive Board of the Canada-US Law Institute since 2009.

Mr. Herman was on the Council of the International Bar Association's Energy Section for many years and served as chair of the Trade Policy Committee of the Canadian Manufacturers and Exporters and a member of the International Affairs Committee of the Canadian Chamber of Commerce and several other business and government trade policy organizations. From 1990-1993, he was the Chairman of the Canada-Taiwan Business Association.

In 2007, he was appointed Director, Task Force on Trade and Investment Rules of the World Energy Council, London, UK. He was named a Senior Fellow of the C.D. Howe Institute in 2011 and sits on the International Economic Policy Council and the National Policy Council of that well-respected think-tank. Lawrence Herman has been recognized as a leading lawyer by the Lexpert/American Lawyer Guide to the Leading 500 Lawyers in Canada, the Canadian Legal Lexpert Directory, the Lexpert Guide to the Leading US/Canada Cross-Border Litigation Lawyers in Canada, Best Lawyers in Canada and Chambers Global.

Together with numerous articles in legal and business journals, Lawrence Herman has written several text books: Canadian Trade Remedy Law & Practice (1997), Canadian Trade Law (2008) and, most recently, Export and Import Controls, Sanctions and Other Trade Restrictions (2010).

The Hon. Peter MacKay
Partner, Baker & McKenzie LLP
Former Canadian Minister of Foreign Affairs, Minister of Defence, Minister of Justice, and Attorney General

Peter MacKay is a Partner in the Baker McKenzie Toronto office. Prior to joining the Firm in 2016, he served in the Parliament of Canada for over 18 years. During that time, Mr. MacKay served in several important ministerial positions, including as Canada's Attorney General and Minister of Justice, Minister of National Defence, and Minister of Foreign Affairs and Minister for the Atlantic Canada Opportunities Agency. In May 2003, Mr. MacKay became the Progressive Conservative Party of Canada's 23rd leader, and played a pivotal role in the reunification of the Conservative movement in Canada and the formation of the Conservative Party of Canada, serving as its 1st deputy leader. Before embarking on a political career, Mr. MacKay served as a Crown prosecutor in Nova Scotia, and spent time in private practice and in Germany as lawyer at Thyssen Henchel. He is the founder of the highly regarded Halifax International Security Forum, which he hosted beginning in 2009. He currently serves on numerous volunteer boards and Not for Profits: the National Board of Special Olympics Canada, Boost Child Youth Advocacy Centre and Wounded Warriors Canada, and supports Children's Aid Society, Big Brothers Big Sisters, Acadia U, and the Canada-United States Law Institute.

The Hon. John McKay
Member of Parliament

The Honourable John McKay was first elected as Member of Parliament in 1997. He was re-elected in October 2015 to serve his seventh term in the House of Commons. He currently represents the constituency of Scarborough-Guildwood. Minister McKay is currently Chair of the Standing Committee on Public Safety and National Security, Canadian Co-Chair of the Canada-United States Permanent Joint Board on Defence, Chair of the Canada-United Kingdom Inter-Parliamentary Association, and Vice-Chair of the Canada-United States Inter-Parliamentary Association. Minister McKay received his Bachelor of Laws from Queen's University in Kingston, Ontario.

The Hon. James S. Peterson
Of Counsel, Fasken Martineau Dumoullin LLP
Former Minister of International Trade for Canada
Former Secretary of State

Jim has extensive knowledge and first-hand experience in government affairs, having served in the Government of Canada as Minister of International Trade, Secretary of State (International Financial Institutions), and Chair of the House of Commons Standing Committee on Finance. As a former Minister of International Trade between 2003 and 2006, Jim has expertise in trade policy and experience in trade disputes. While Minister, he represented Canada at the World Trade Organization's Doha round of negotiations which focused on expanding trade and investment in leading emerging markets including Brazil, Russia, India and China, and dealt with complex issues related to trade with Canada's NAFTA partners, the European Union, the Middle East and the Americas. As Secretary of State (International Financial Institutions) from 1997 to 2002, Jim was instrumental in piloting significant financial institution reforms through Parliament including legislation permitting foreign bank branching and aligning Canada with international standards in the fight against money laundering and terrorism.

Steve J. Petras, Jr.
Partner, BakerHostetler LLP

Steve Petras practices international business transactions as a partner in the Business Group. He has facilitated commercial and corporate transactions in most countries throughout the world. When representing companies seeking to expand operations in foreign jurisdictions or in business transactions with parties from different countries, Steve seeks to create effective and efficient corporate and tax structures and enforceable agreements in the multiple jurisdictions involved. Furthermore, he advises on the compliance of the business activities and the parties with the applicable U.S. and foreign laws and regulations. Steve has deep experience representing clients in the manufacturing and technology industries,

where his technical background and interest enable him to better fit each transaction with the underlying technology of his clients' businesses.

Steve led BakerHostetler's International Industry team from 1998 through 2012. He is actively engaged in the international community of Cleveland and Northeast Ohio, having served as president of the Greater Cleveland International Lawyers Group, chair of the International Section of the Cleveland Metropolitan Bar Association, chair of the board of the Cleveland Council on World Affairs and president of the Cleveland World Trade Association. He is also a member of the board of directors of the World Affairs Councils of America. Additionally, Steve is an adjunct professor in the International LL.M. program at Case Western Reserve University School of Law. Dedicated to increasing international business in the U.S. and Ohio, Steve had been appointed by the U.S. Secretary of Commerce as a member of the Northern Ohio District Export Council and by Governor George Voinovich as an Ohio Commodore. Steve is the USA National Director of the Canada – United States Law Institute and is also a member of the board of directors of the Council of the Great Lakes Region.

Commissioner Lana Pollack
Chair of the U.S. Section, International Joint Commission

Lana Pollack was appointed Chair of the U.S. Section, International Joint Commission, by President Barack Obama, effective June 26, 2010. Throughout a diverse career in public office, education and the public interest sector, Ms. Pollack has demonstrated leadership on a range of public policy issues. She served from 1996-2008 as president of the Michigan Environmental Council, a coalition of 70 environmental organizations working to protect the Great Lakes and Michigan's environment. She was elected three times to the Michigan legislature, serving as a state senator from 1983-1994. As a state senator, Ms. Pollack became a leading advocate for women, children and the environment. Ms. Pollack, who grew up on the shore of Lake Michigan in Ludington, earned a BA in political science from the University of Michigan (U-M) in 1965 and an MA from U-M in 1970.

Dr. Eugene Takle
Professor of Atmospheric Science, Iowa State University
Co-Chair, Board on Oceans, Atmosphere and Climate Association of Public and Land-Grant Universities.

Dr. Takle's research emphasizes the use of climate science, both modeling and analysis, for investigating the causes and future impacts of climate change. I also lead a team that conducts meteorological measurements and analysis of data taken at the surface and from tall towers within and near utility scale wind farms. The objectives of this research are: 1) Improve the predictive skill of wind forecast models; 2) Understand wind-farm power reduction due to turbine wakes; and 3) Evaluate the impact of wind farms on crops.

David Terry
Executive Director, National Association of State Energy Officials

David Terry is the Executive Director of the National Association of State Energy Officials and has worked with NASEO in a variety of capacities since 1996. Mr. Terry leads NASEO's programs in support of the nation's 56 State and Territory Energy Offices. The organization communicates the states' views on virtually all national energy issues, including electricity policy, energy efficiency market transformation, renewable energy commercialization and deployment, industrial energy efficiency, energy assurance and reliability, building codes and efficiency, and climate oriented energy programs. Mr. Terry has 20 years of experience working on a range of energy issues for such organizations as the Association of State Energy Research Institutions, Governors' Biofuels Coalition, National Academy of Sciences, and the U.S. Department of Energy. Prior to working in the energy area, Mr. Terry was a statistical analyst for a market research firm, an analyst with the National Academy of Sciences, and a researcher for The Washington Post. He received a BA degree from Bowling Green State University, Bowling Green, Ohio, and he has completed graduate coursework in statistics and marketing at Virginia Tech, Blacksburg, Virginia.

Karlis Vasarais
President and CEO, Imtex Membranes

Mr. Vasarais is currently head of Imtex Membranes, a petrochemical industry technology company. He is a devoted low-carbon economy entrepreneur focused on financing and commercializing emerging process efficiency technologies, along with innovative fuels and specialty chemicals from waste. With several commercialized companies under his belt, Karlis has shaped a unique combination of business strategy, policy formation and capital mobilization expertise for low-carbon technologies in the energy and resources industries. Karlis was recently appointed Honorary Consul for Latvia in Southern Ontario. He serves as Vice-Chair of the Board for the Latvian Credit Union. Karlis earned his Bachelor degree in Commerce from Queen’s University and a Master’s degree in Public Policy from Johns Hopkins University’s School of Advanced International Studies.

WELCOME AND OPENING OF THE 43RD CUSLI ANNUAL CONFERENCE

Speaker: Stephen J. Petras Jr.

DEAN SCHARF: All right. Good morning, everybody, if you will take your seats. We will go ahead and get started. Okay.

Well, hello, everybody. If you don't know me, I am Michael Scharf. I am the Co-dean of Case Western Reserve University School of Law. We are one of the two partnership schools along with Western Ontario that make up the Canada-US Law Institute, and you are going to meet today several of the people whose time and energy is well spent putting together this conference and the other activities of the center.

It is a great pleasure to welcome you to a spring day in Cleveland as we look out the window and see the snow falling here in the beautiful botanical garden. And one of the things I do tell students when I am recruiting from Arizona and California to come to Cleveland, I say, you know, in Cleveland when it is cold, we just cross the street, and we go to Costa Rica.

And that's because the Botanical Garden has a giant Costa Rica biosphere, and you are invited today -- the building is completely closed off except for you, and you all are invited at any time to explore the Madagascar spiny desert, the Costa Rica biosphere, and the theme that they are building today is Butterflies, and you will see many butterflies in there.

Now, butterflies are not going to exist much longer if international global climate change continues unabated. And that's the real reason we are all here at the conference today to talk about the what the two countries, Canada and the United States, can do to try to hold off climate change and to respond to its ravaging effects in both countries and around the world.

We have an amazing panel set up for you today. It is going to be a fantastic conference today. And one of the most important things about this conference is the ability for people to network, to get to know each other, you get to know Canadians, Americans, business people, government people, academics, we are all here sharing one experience.

So without further ado, I will ring Henry King's famous bell that has been rung for 43 years at the start of every Canada-US Law Institute and call the conference to order.

(Bell being rung.)

Dean SCHARF: Okay. Let me turn things over to Steve Petras.

MR. PETRAS: Thank you, Michael.

Thank you for opening our 43rd Annual Conference of the Canada-United States Law Institute. Welcome, everyone, here to the Botanical Garden, a perfect setting for a discussion on climate change

So what we are going to do, we are going to get right into the program now. At our luncheon program, we are going to have an introduction of our executive committee and of the other people who make the Canada-US Law Institute work.

But right now we are going to jump right into the program. So in putting together this conference, we thought it would be very important to set the stage with the science, you know, with the facts.

What are we talking about? What is climate change really? What's physically going to happen in the United States and Canada that we need to deal with? So we looked around to find who is the right person, who can tell us about this, and we actually hit an absolute grand slam home run because we have with us today Dr. Eugene Takle.

He is the Emeritus Professor of Agronomy in the Department of Geology and Atmospheric Science at Iowa State University. He is an undergraduate in physics, and he is also a Ph.D. in physics, and then he started focusing on climate -- climatology.

And interestingly enough, he is the founding member of the multi-institutional multinational team that has assessed the future of climates in the United States and in Canada, and he did this together with Iowa State, a number of other institutions, including the University of Quebec and Montreal. Okay?

Interestingly enough, all of you have probably heard about the 2018 National Climate Assessment, which is published by the U.S. government as a statement about the situation and facts of the climate. It was a very infamous document this past year because our present Administration didn't like it that much, was very critical.

Well, Dr. Eugene Takle is one of the co-authors of that study, so he is not only a person who has assessed the impact of climate change on Canada and the United States, he organized the teams to do this investigation, he is also an author of that national study and statement on the climate of the United States and Canada.

So without further ado, Dr. Takle, the conference is yours.

(Applause.)

OPENING LECTURE –

CLIMATE CHANGE: THE FACTS

Speaker: Dr. Eugene Takle

DR. TAKLE: Thank you for those kind words. So we are going to jump right into the background, and not being presumptuous in that you studied this, you have probably seen fragments of this, but I am trying to pull this together, the core of why we understand climate change and the significance of it. So I am going to be going in two sections here.

We'll look, first of all, at fundamental science, and then we will look at some of the issues and impacts so we can look at some of the factors that are going to be driving the impacts and things that we have to think about trying to develop resilience to, because some of these are going to be very serious, and we will get into that.

We have a lot of good foundational documents to draw on, to look at both the science and the impact. So for instance, the intergovernmental panel on climate change issues, which is about every five years, state of the climate on the global scale and an update on the science of climate change, and so we have the 2004 issue of that.

And then, we have national documents that parallel the international document. The one for Canada is put out by Natural Resources Canada, and so that's an updated document that you have at your disposal. In U.S., we have two documents, one that was issued about a year ago which covers the science of climate change. So it is just the IPCC document and then updates and focuses on the science for the U.S. And then, the one that was just issued the day after Thanksgiving was the fourth national U.S. climate change assessment, and I was involved in that one as well.

So we will look at some of the fundamentals of why we have this issue, and then, we will look first globally, and then we will look at North America and a few words about the Great Lakes. Well, the clim -- when we talk about the climate system, we are really talking about land, ocean, atmosphere, and ice masses. Those are the four components of the climate system, and energy moves between these and among these reservoirs then.

And so to understand the climate system, we have to understand how energy and mass is moved among these reservoirs. So ice melts, and it takes energy to melt ice. So part of this increase in energy that we are seeing is used to melt ice. And so that's the way we look at it.

We use the same laws of physics to build airplanes, to build nuclear power plants, and we have confidence in these laws. Because we ride in airplanes, we have confidence. We can live in the vicinity of nuclear power plants because we know -- we use the laws of physics to design these. These same laws are used to look at our climate.

Now, there is a lot of uncertainty because the climate system is a big system, and we need a lot of observation. So there is a level of uncertainty, which is also a part of our science, to quantify our level of confidence in these various statements that we make.

And so when you read these documents, you will see references to how confident we are in the results. Well, there is ten indicators, at least ten that we can look at, and so this is just warming of the globe, but it is sea surface temperatures; it is sea level; it is water vapor in the atmosphere, just going up in the warmer world. The near surface, the lowest two, three miles of the atmosphere, we look at the temperatures of that.

We look at glaciers that are melting. Snow covers are going down sea ice is going down; look at temperature over land, and a very important one is ocean heat content, which doesn't give it much attention, but 90 percent of the heat that comes into the climate system goes into our ocean.

So that's a reservoir that is sitting there, waiting, and could be redistributed in ways that we are only beginning to understand. So that's an important factor in the climate system. So the basic concept, then, is that they meet the greenhouse house, and it is a natural effect, and we are glad we have that because that's what keeps us from having global average temperature of about minus 10 degrees Celsius, or something like that.

So it has a blanket of these gases, mainly carbon dioxide but also nitrous oxide, methane that trap some of the heat and keep it from going back out to outer space, and so it is redirected toward the earth.

Now, what we are doing is we have increased the levels of carbon dioxide, methane, nitrous oxide, and other gases to the point where more of this solar radiation is being trapped, and that means that the temperatures in this vicinity are rather small.

Now, it is always important for me to point out that this cartoon here shows that we have this big thick layer here. In fact, if the earth was the size of a basketball, this layer would be the thickness of two sheets of paper. That's all it is. And it is that thin sheet, and there are two gases: There is carbon dioxide and ozone. If it weren't for those gases in that thin sheet of atmosphere, we couldn't survive. People could not survive.

Lack of ozone means that the ultra-violent light would fry us. And carbon dioxide, not having the right amount of carbon dioxide, means that we know we could not exist. So this very thin sheet of atmosphere is what we are doing, is a gigantic chemistry experiment. Well, we don't know the outcome. So that's the sobering reality of it.

So if we look at carbon dioxide, which I am going to focus on carbon dioxide, but we will talk a little bit about the others, but carbon dioxide, if you look at the record and it is hard to see from where you are at, this is an 800,000-year record. So it goes back 800,000 years, and this is the present.

And you can see that over that time period carbon dioxide has never gone above the blue line. The blue line is 300 parts per million, and so about 1,900 with the industrial revolution having begun 120 years earlier, we introduced a lot more carbon dioxide in the atmosphere. So it went up to about 300 parts per million.

Well, about a year ago we finally got up to 400 parts per million, so we increased the carbon dioxide, this key gas that regulates the heat of our planet. We raised it by over 35 percent, and it is going up.

There is no sign that it is going down anytime soon here, so we are now up here at about 400 parts per million. So here is sort of an iconic figure that is often used to show how the temperatures on the planet have changed. And this is a case from 1880 to 2018.

So we can see there has been variability over the -- from year to year, but then starting in about 1970, we started on this upward trend of very monotonic upward trend of fluctuations with year to year, even with decades -- there will be a decade that will have an average that maybe haven't gone on quite as much as some decades as others but, generally, upward rise.

And with our model is studies, we know that it is these greenhouse gases, the increase of these greenhouse gases that are the cause of this rise that we are seeing now. You can say, well, maybe it is natural variability. Well, let's look at natural variability.

There is the impact of volcanos in the last 60 years. We have had three major volcanos. We have Mount Agung, 1963; Mount El Chichon in Mexico, 1983; Mount Pinatubo, Philippines in '91, and you can see every time we have a volcano, we see a drop in the global average temperature by about one or two degrees Celsius. It drops, and then it gradually comes back over a period of about two years, back to whatever the pre-existing trend was.

So it has a temporary effect by putting lots of particles in the atmosphere that reflect more solar radiation, so it forms kind of a shield or a reflective area, but it is transient, and it does not have a long-term effect, but it is important nevertheless.

We also have El Nino events or ENSO, E-N-S-O, which is referred to down here, which the El Nino and La Nina is a combination. El Nino is an event where the tropical Pacific ocean, for reasons that are not fully understood, goes through a warming period, which may last for a few months to maybe even a year, and during that period, this extra warming we get in the tropical Pacific has a global impact. It causes the temperature to rise.

And so we see every time we have an El Nino we see a spike. It may last a year, it may last even a little bit longer than a year. I should point out I haven't listed all the El Ninos. I just listed some that demonstrate what a strong El Nino can do. But nevertheless, that's part of natural variability.

Now, if we also look at the La Nina, which is the opposite effect -- that is a cooling of Central Pacific -- it also has a global effect, and so you see that for the blue arrows, every time there is a blue arrow, you see there is a decrease in the global average temperature, again for maybe a few months or maybe it will be for a year.

So this, then, this is a measure of some of the natural variability because a lot of the climate sceptics say, well, it is just natural variability. We have natural variability, but look at the scale of natural variability versus the scale of the greenhouse gas extra greenhouse gases that we have introduced. So science is clear.

We know the thermodynamics well enough that if you put heat into a system, the temperature goes up. And so that's what we are doing, and that's what we are studying here, and these are the consequences that we have.

And so we have to conclude, then, that there is really no known natural phenomenon that is influencing our global and regional climate on scales of a century that is as large as the influence caused by emission of these greenhouse gases.

I am going to talk today also about carbon dioxide, but let me just say a word about methane. Methane is about 20 times as potent as CO2, but its concentration is a lot lower, about a thousand times lower. However, it has a short lifetime.

So if we are making policy, one of the low hanging fruit areas is reduction of methane. So that may be something to think about. The sources of methane as to sources are from animals and fermentation in animals, cattle, dairy cattle, goats, beef cattle primarily, also from natural sources of wetlands, landfills, rice cultivation. These are sources of methane, and we have some and are doing some work on those.

Diets of animals can be twiddled to reduce the amount of methane produced and so on. Nitrous oxide is a very potent greenhouse gas, about two or three times as potent as carbon dioxide but, again, even in much lower concentration, but it results from agricultural activities and some other sources that could be addressed also, should be addressed as we look at all options for reducing greenhouse gases. Let's look at the consequences.

The observed -- this is the observed surface temperature, 2001 to 2012. We don't have data on the polar regions over that region of time, but you can see that the warm spots are primarily in the northern hemisphere, high latitudes, and in some areas in South America, so we have good evidence that the planet is warming. Only there are a few regions that actually cooled over that period of time.

And we know pretty well why those are occurring as well. Precipitation over land, same period basically or actually two periods here. If we look at the whole period of 110 years, you can see there has been precipitation increases as would be expected in a warming climate. You have more heat, you are going to evaporate more water, you are going to have more humidity in the atmosphere, and you are going to get more rainfall. So you just speed up the hydrological cycle. You see it has been intensified and polarized more in the last 50 years. We have seen that the eastern half of the U.S., the eastern half of North America has seen increases as have the northern parts of Europe but also the dry areas have gotten dryer.

So again, kind of a warning sign, a heads up that some of the extremes, the wet regions get weather, the dry regions are getting dryer, and we have to look at populations that are influenced by these regional changes.

Other changes that have been observed, snow covered in the northern hemisphere is going down. Arctic sea ice we will come back to that. That's also going down dramatically. We will come back -- this one also, ocean heat content is going up.

As I mentioned, a lot of the heat is coming from this track and like greenhouse gas, it goes into the oceans, and sea level is rising, and we will come back to that. So let's look at ocean heat content.

These are huge numbers. This is 10 to the 21st joule; another: One zettajoule, that's a new one. We have gone from megabytes to terabytes to exobytes and petabytes, and if you go out a couple more, you get to zettabytes. Well, this is zettajoules.

But at any rate, you can see that your ocean, the lowest or the upper 2,300 feet is warming quite rapidly. It went up abruptly, rapidly at the beginning of the 21st century but also now the deep ocean is getting involved. And so heat is being distributed through the ocean.

And we don't really know what the consequences of this continued warming of the oceans are. It is certainly going to change the overturning. One of the worries is that we might slow down some of the global ocean circulation that moves warm air from–warm water from the tropics to the polar region, so we may have some changes in the Gulf Stream, for instance, which is a major source of moving heat from the tropics to the poles.

The northern hemisphere, sea ice, our observation period here maps on to the satellite period, so we can see that there is a substantial drop in Arctic sea ice, which is continuing, and we will see a projection of that in just a minute. So looking at Canada, now, this is a bit washed out, but these are observations in Canada. So this is temperature, so these are the proprietary provinces here, the Arctic up here, and you see that there has been some substantial warming in the West.

And you can see there is kind of a heads up about forest fires and so on in that region, also some warming in the southern provinces. Overall average mean temperature has gone up substantially in the last 60 years. If we look at precipitation, we also see that coastal areas have had precipitation increases, and so some of the flooding has been seen there in Alberta here, had some major flooding in recent years.

Overall, again, there is a rise in precipitation over Canada, and this -- and Arctic sea ice, shows both a summer demise of sea ice but also even in the winter. In March, they ended a cold season. You can see that even the extent of ice has gone down during that period.

Great Lakes, the Great Lakes, of course, it is the largest fresh water body, about 20 percent of the fresh water surface area, and it certainly plays a role in the economy of the Midwest for shipping, industries, water supplies, fishing, recreation, and so on, but it is under siege now because of the stress from pollution, nutrients, indicia and sediments from agriculture systems, and also invasive species are becoming more problems moving forward.

Let's move into future climates. So if we are talking about future climates, first of all, we have to consider it is going to depend on greenhouse gases are going to be in the future. Are we going to adopt a really good renewable energy future that reduces the amount of fossil fuels we burn, or are we going to just do business as usual?

If we do business as usual, we follow this red curve here, and you will see this RCP, the radiation constructive pathways, that can go from very low emission of carbon dioxide and greenhouse gases to a very high.

So 2.6 is low; 8.5 is high, and you will see that referenced in some of the scenarios that I have applied here. So if we go ahead and continue this, then we can expect the global average temperature to rise between 4 and-a-half and 5 degrees Celsius, way beyond where we have been with temperatures on the planet in the last many centuries.

If we adopt a 4 -- say a 4.5 scenario, that's the blue, then we would be able to keep it down to about 2 and-a-half. But the agreement that was reached in Copenhagen -- and I can't remember the year now -- but there was an estimate to what would be a guardrail that we could set, and that was -- that we would not have major impact on water supplies, agriculture systems, natural systems, and that was estimated to be two degrees Celsius.

Well, we don't have much head space even now so if we are going to keep the planet more than what has been estimated to cause major interference with a natural climate system, we have to get on with this battle to reduce greenhouse gases. So let's look at some scenarios. These are from the IPCC reports.

Here is a low output scenario. Here is a high emission area. You can see generally we are seeing that the Arctic regions are going to warm much more than average on the scale upwards to 10 degrees Celsius, very large rise, enormous impact on ice masses, and if we start to warm and start to melt Greenland, we could go into an irreversible condition there that leads to a melting of Greenland over several centuries, very worrisome scenario.

Precipitation, we see that precipitation is likely to increase. Primarily this is percent wise now, so if it is small and you double it, then it doesn't lead to a big increase in absolute amount but a big increase in percentage wise, but however, it does have a big impact on the polar regions, and also some tropical regions would likely be impacted strongly.

This is sea level, and sea level rise generally would be expected to be on the order of close to a meter, a little less than a meter. If we look at some other factors, also again from the IPCC -- by the way, I will give you a copy of this or get it from the conference organizers, the citations are all listed in here, so you know where they come from. If it is not listed, then it is something that I created, so -- but here is then the two pathways, that if we follow this 2.6, RCP 2.6, you see that we can make this temperature level out by the end of the century.

However, if we go business as usual, we will be about in this 40 Celsius range. If we look at sea ice extent, the only way we can keep sea ice from disappearing in the summer is to adopt this very efficient strategy of low caliber emissions in our future. Otherwise, we are going to lose our Arctic sea ice by 2060 or 2070.

PH, the ocean acidity is often overlooked, but it has become a very important factor, too, now because some of this carbon dioxide is dissolved in sea water, and so it raises the acidity or lowers the pH of sea water, and that's -- we are already seeing that the warming and the acidification in the oceans is having an impact on coral reefs, very sensitive structures in our oceans that lead to a lot of very rich

and diverse ecosystems in shallow and coastal areas, but they are already being affected.

So here is some simulations and looking at the pace of climate change -- and these are simulations by the Canadian center for climate modeling and analysis, and I want to point out that we have very, very good relationships in the scientific community between Canada and the U.S., and these go back a long ways.

My own group that out of state we have worked with the Canadians -- and Michael might say a little more about that this afternoon -- but a team that works directly with stakeholders to say what is it that you need and what kind of climate products can we generate to help you make those decisions, very good people to work with, and we worked with them back in the late 1990s.

But this was not from -- it was from the climate modeling analysis center, but it shows you the trend, and you will see how the warming starts in the Arctic regions and progresses down, just works its way down through the whole continent.

If you go on this website that is listed there, you will actually get this as an animation, so you can just -- it marches through year by year, and you can just watch it progress. It gives you better insight as to how and where these are going to be -- that's three minutes. Okay. Well, we will big time. Okay.

Precipitation, these are from the group that I work with in the U.S. showing precipitation changes that are expected by the end of century. This is a high-emission scenario, but you see, again, precipitation and projected increase pretty substantially in the Arctic area, but also we are seeing continental drying in the summer that is going to be problematic for -- particularly toward the end of the century with regard to agriculture, and we looked at this in the Midwest.

Let's look at some other impacts of, for instance, heat. Projections are with a high emission scenario in some regions of our country are going to see on average over 120 days with temperatures about 100 degrees Fahrenheit. When you consider water supplies for Las Vegas and Phoenix, you have to consider that this is what they are going to have to provide. This is what the outdoor environment is going to be, pretty sobering.

If we look at one of my colleagues out of state, Craig Anderson has looked at heat and violence, particularly assaults and murders. Now, he separates those from non-violent, the car thefts and petty theft and so on.

Assaults and murders scale upward with temperature increases, a very distinct – looked at many populations. There is an increase in violence with temperature. There is no increase in non-violent crime, but there is with violent crime. So that's something we have to consider, particularly as we move forward, and we find that some of our heat waves, five-day heat waves are going to be much larger. This is something we looked at in the 2018 climate assessment of the impact of heat waves.

I don't have time to talk about that now, but sea level rise, we could be seeing on the order of a meter rise in sea level by the end of the century. A meter rise in sea level would take out these areas, would inundate these areas in red, so we would lose the Keys, lose Cape Canaveral, and many of the favorite cities here in the winter would be inundated, so we have some real challenges.

Miami is already looking into their problems in sea level rise. The military has a hundred billion dollars at risk, naval facilities only for a rise of sea level of three feet, one meter, so the military has a big relocation problem on their hands. This is something we better start planning for now.

This is the kind of thing that we get, this is Iowa, this is not the current year, but we are seeing a flood now in progress right now as we speak. It is estimated already to be over a billion dollars in damage just this week. Here noteworthy, this is an Iowa town downstream of Cedar Rapids. Here is a hog confinement facility. Here are grain storage facilities, so it is not just people that are at risk; it is our storage; it is our fruit supply; it is animals that are under confinement that multiply the effects of these events, which now are at historic levels.

Great Lakes, what's going to happen there? Well, what we have observed so far is there is lower ice cover in the winter, warmer summers, more frequent, more intense storms. Water levels are influenced by warmer air temperatures and drought and changes in precipitation pattern.

Also very important is that, as the warming progresses, it changes the cycling of the water, and so it changes the transport of nutrients from deep water to the surface, and so that has a profound effect on ecosystems. There is a natural cycle, an annual cycle of about a foot or so, and the historic highs and lows are about a five-foot difference.

If we look at projections for the future, we can see about a six to seven-degree Celsius rise in surface temperature by 2100. They will fluctuate at a lower level probably, more widely around the lower mean, and there will be a decrease in the ice mass.

If we look at some of the economic and social disruption we have already seen -- and this is the 21st century, so these are all since 2000, this is Canada -- you can see here they had a billion-dollar flooding event in Alberta

In 2013, and others, primarily hurricanes, tornadoes, flooding, wild fire and wind storms. If we go to the U.S., we see the same thing. This is just 2018 alone, one year, $14 billion in economic damage: Wildfires, flooding, we have drought, tornadoes, storms, hurricanes.

And so if we look at the changes that we have seen here, this is 1980 to 2018, the big ones, up here in the $12 to $16 billion dollars have all been since the year 2000. So we are in a different realm. We have got to start planning for this. We have to develop resilience policies that will enable us to avoid this kind of economic disaster.

And so, finally -- and my last slide here -- is climate change hotspots. This was work done by a colleague of mine, Filippo Giorgi from Italy, looking at regions around the globe, which, according to this regional climate change index, he has developed where there's a big red spot, it means there is a big climate change, and it is important to recognize that our societal structures are all tooled to the global climate that we have had during the 20th century, the rainfall patterns, the temperature patterns, the seasonality and so on.

Now, those are all changing, which means that the agriculture that we finally tuned for a particular area is going to have to change. You raise soybeans in Iowa, the center part of Iowa, you take those soybeans and put them in Minnesota, they

won't grow well. They won't produce because it has been so finally tuned for that specific location.

You can find your favorite structure of society, that also is very finally tuned. So we have to start thinking, and as I just pointed out that what's going to happen, then, when we have people in these high impacted areas, what are they going to do if their food supply is being threatened or as was the case in Syria, two back-to-back droughts, led to people migrating to cities, overwhelming city services, and leading to unrest and terrorism and so on.

So in summary, science is clear, climate change is real, it is already here. It has had a negative impact on our society, both of our countries. There are some aspects of climate change that we are taking a benefit from, and that's good, but they are not going to last. The projections of future climate scenarios point to costly impacts on infrastructure, forest and agricultural productivity and health and societal instability.

Thank you very much for allowing me to speak to you.

(Applause.)

MR. PETRAS: Thank you very much, Gene, for that very interesting report. Does anybody want me to turn the heat up in this room right now? We have time for, let's say, two questions for Dr. Takle.

Peter Mackay?

MR. MacKAY: Thank you very much, Doctor. Fascinating presentation. One of the things that you said that struck me as quite stark was this increase in violence, and clearly, you have the data that shows this, but can you unpack that a little further and attribute why that is having that particular effect?

DR. TAKLE: Yeah, yeah. Craig Anderson, a colleague at Iowa State, did this, a paper published this present year, just a couple months ago, and he shared some of this information with me.

Now, he has just used annual temperature, but we -- what we need to do now is to look at heat waves, specific heat waves because we know that it is a five-day period, or it is day after day. That's what really gets to people. You can usually take one really hot day, but it is these extended periods.

And so what they have done is, they looked at -- they looked at various cities, and they have made the corrections for demographics, for different factors that anyone would say, well, people are just more outside in the summer time.

They made corrections for that, and they teased out the climate-only factor. I am not an expert on that, but I can point you to the literature and help you work with that.

MR. PETRAS: One more question.

Terry Fitzpatrick.

MR. FITZPATRICK: Dr. Takle, I am not sure if you ever heard of an author by the name of Tom Nichols called "The Death of Expertise." He is a professor, I think, at the Naval Academy.

He talks about the skepticism in our society of experts and the fact that the irony of the fact that with all of the different means that we have of getting information out through the internet, that people are actually becoming very much in their silos just getting things sort of confirmed, the biases that they have.

I was just wondering if someone like you has any ideas how the scientific community can communicate or policymakers can communicate more effectively with people to try to get these facts out there to overcome some of the skepticism that we have.

DR. TAKLE: Yeah, that's a question we recognize that we dropped the ball early. We were not communicating early, and we were too focused on our own research, but the facts -- people will -- when you present facts to people, they will back off, and they will go to further and further away kinds of arguments.

So it basically then comes down to what is known as personal beliefs. It could be based on religion, the God that I believe in wouldn't let this happen to us, but we can't do scientific research on that. That's not something that is fact checkable.

So then, we are kind of left there; that they just -- they are presented with all the facts, and they are not -- we are seeing this with vaccinations; we are seeing it with pasteurized milk. You know, it is just a part of the society that we live in, that experts and science is not held in high value the way it used to be.

MR. PETRAS: Thank you very much, Dr. Takle, appreciate it.

(Applause.)

MR. PETRAS: Dr. Takle will be available, and he is staying here at our conference throughout the day, so we can ask him more questions. Well, to try to get back on track as quickly as we can, we are going to call up our next panel. If we could have Consul General Comartin; next is Mr. Blanchard, Mr. Peterson, and Minister MacKay, please come forward.

(Pause.)

AMBASSADORS' AND MINISTERS' ROUNDTABLE – WHAT ARE THE PROSPECTS FOR HIGH-LEVEL COORDINATION?

Moderator: Consul General Joseph Comartin

Speaker: The Honorable James J. Blanchard

Speaker: The Honorable James S. Peterson

Speaker: The Honorable Peter MacKay

MR. PETRAS: Our next panel consists of ambassadors and ministers roundtable, and their selection is "what are the prospects for high-level coordination in Canada and the United States?

Our moderator for this panel is Consul General Joseph Comartin. He is the Consul General for Canada in Detroit, and he is a lawyer. He started out his practice in Windsor, Ontario, and then he decided to go into politics, and for 15 years, he was a member of the New Democratic Party in the House of Commons in Canada.

He was -- he got very strong support from the local union members with a seat in the House of Commons. He was reelected four times and was the opposition house leader from 2011 to 2012. He is now Consul General for Canada in Detroit, and he is going to introduce this panel and lead this discussion.

Joe?

CONSUL GENERAL COMARTIN: Thanks, Stephen. I have been joking about this cold, but I didn't get it when I was in Canada. I got it after I came to the United States, so I am blaming the United States for it, and that's because Windsor is south of Michigan, not north of Michigan or the United States as most or the rest of the continent is divided.

Let me start by introducing our panelists, first with Ambassador Blanchard, James Blanchard. I have got to say I have a whole bunch of material on him, but the only thing that is really important is that he was the ambassador to Canada. Everything else doesn't hale by comparison.

I think you also know that he was governor of the state of Michigan for a good number of years. He is presently practicing law as a partner and chair emeritus of the government affairs practice group in Washington, but he spends a fair amount of time in both Michigan at his cottage and in the Detroit area and his home.

Our second panelist is Jim Peterson. Jim was in parliament along with Peter. The three of us were in parliament at various times together. He is a former federal minister, secretary of state. He is currently of counsel at the law firm of Fasken Martineau.

HONORABLE JIM PETERSON: Yeah.

CONSUL GENERAL COMARTIN: Yeah. And in his role as minister, he was the minister of international trade, secretary of state for international financial institutions. He was also chair of the House of Commons standing committee on finance, which is probably the most powerful standing committee in our parliament.

As a former minister of international trade between 2003 and 2006, Jim has developed expertise in trade policy and experience in trade disputes. I think what is particularly interesting is some of the work he did while minister, he represented Canada at the World Trade Organization, a round of negotiations. Those focused on expanding trade and investment and leading emerging markets, including Brazil, Russia, India, and China. He also dealt with complex issues related with trade with Canada's NAFTA partners, European Union, Middle East, and the Americas. So he has a wide base across the globe in terms of Jim's experience.

Our third panelist is Peter MacKay. The only thing I remember about Peter, I was also --Stephen had mentioned -- I was also deputy speaker of the House of Commons for the last three years. I remember one time I was bugging him about judicial appointments. This is when he was minister of justice, and he actually tried to bribe me, he said "look, okay, I will make you a judge then," and I said "Peter, that's like really improper. You shouldn't do that," and he withdrew the offer.

But he was the justice minister for a number of years. He served in the parliament for over 18 years. I thought we had started at the same time, but you are three years ahead of me.

He had several important ministerial positions in addition to the minister of justice of Canada, a very interesting point at this point. You are both the attorney general and the minister of justice. That's a hot point in Canada right now.

He was the minister of national defense minister of foreign affairs, minister of Atlantic Canada Opportunities Agency.

In 2003, Peter was the -- elected as the head of the conservative party, and at that point, he led the, I guess, campaign to merge the party with another conservative party into the conservative party of Canada where he became deputy leader.

He is presently -- he left parliament in '15, I think that was, or '11. But he is currently serving on a number of volunteer boards. He is practicing law with a large firm in Toronto. He serves on a whole bunch of boards.

I am not going to list them all, but maybe I will: National Board of Special Olympics, Canada; Boost Child Youth Advocacy Centre, Wounded Warriors, Canada, supports Children's Aid Society, Big Brothers, Big Sisters at Acadia University and Canada-United States Law Institute, which is why he is here today. Okay.

We can start. What we did in preparation for this was to take a look at -- obviously, you heard a good deal of the factual situation of what we are confronted with climate change. Obviously, we have, as politicians, as leaders right around the globe taken a number of steps to confront this problem. I think probably the most recent one that we are all generally aware of was the Paris Agreement, determined at that point certain levels of CO2 and greenhouse gas generally that

would meet and every country in the world that signed on to the agreement had specific standards that they had to meet.

Unfortunately, the United States has now indicated they are going to pull out. They actually can't do it under the agreement until 2020, but China and Russia are not major participants either on this, so that's in terms of framework. Most of the other countries have, in fact, abided by the obligations they took on, some a bit slower than others, but it is working.

The hope is that at some point the United States, China, and Russia will come on. Obviously, all three of them are major emitters of greenhouse gases.

I think the other interesting point in terms of setting the scene from a government standpoint, if I can, was some of the points that John Godfrey made last night at the keynote address, and that is the work that subnational governments, municipalities, community groups states and provinces, that governments at that level, how they have taken up the torch. They are the ones who are pushing this and a number of countries greater than the national government is.

When you see the type of information that we had, it was a clear indication, this is a local issue. It is a world issue, but it very much impacts at the local level when you see those kind of numbers, the flooding, all the other financial consequences of climate change, that that is going on at that level.

So today what we are hoping to do is from our three panelists is have them address some of the problems they see, that government officials, both elected and appointed, have in terms of dealing with the climate change.

So let me start -- I did send around some questions that we have had an opportunity to prepare and not springing these on them.

I think the initial point that I would want to have addressed is the fact that Canada has and the United States are going -- and I am talking national governments now -- are going in somewhat different directions and levels of commitment in terms of dealing with climate change.

So my question is to the three panelists -- and I will start, Jim, with you -- what are the implications for North America and for the globe overall by this difference between Canada and the United States?

GOVERNOR BLANCHARD: Well, I really enjoyed the earlier presentation, also John Godfrey's last night, and also I want to thank the Consul for its continued support of this conference and the Institute, and Joe, welcome –

CONSUL GENERAL COMARTIN: Thank you.

GOVERNOR BLANCHARD: -- officially to our ranks and Maureen as well.

You all know that President Trump had his people withdraw from the Paris Calamint Court. They also withdrew from the TransPacific partnership. They also blamed President Obama for bugging his phones and the United Kingdom as well and described the current NAFTA's worst trade agreement ever devised and the new NAFTA, the best agreement ever made. So what do we make of all this?

The reality is, whatever goes on at the top is going to change in my opinion. We are going to have a new president. In two years, we are going to rejoin the Paris Calamint Court. It is a voluntary agreement anyway. States are already moving toward dealing with climate change.

I think you are going to see collections of states working together along with Canadian provinces. Most businesses in the energy field, I know I served on the board of an energy company for 17 years, are accepting the science of climate change.

They may argue about how much of it is manmade, how much isn't. They are already moving to renewables, even the big energy. Big oil companies are buying up or starting solar and wind and renewable energy projects all the time. So the momentum is going to continue no matter who is in the White House. It will accelerate once we have a different president. Yeah, I know I am a partisan Democrat, so you would expect me to say that, but the reality is it is going to happen.

The question is whether collectively, as John Godfrey said last night, collectively, we can have the kind of impact that we want to have. I can tell you the new Congress, the new House has created a select committee on the climate crisis. They don't even say climate change any more, and they are moving on the legislation that may or may not be adopted in the Senate or signed by the President, but the momentum is there.

Also, you know, it is interesting, almost all of the democratic candidates for president are talking about climate change. One of them is Jay Inslee, the Governor of Washington State, is making climate change the central focus of his campaign almost exclusively, which I think is also significant.

But you are seeing, as I said, industry is moving dramatically from coal to natural gas. I was glad John Godfrey mentioned nuclear because I happen to think we are going to need that, and that's a sensitive matter but I think an important one. So I think there is -- no matter what is being said in the White House, the movement toward cooperation and change and renewables and action is going to continue, and I think the younger voters are going to insist on -- those who are older may say "I won't be around when things really get bad," but I think young voters and millennials can play a very, very significant role in elections related to this issue on both sides of the border.

CONSUL GENERAL COMARTIN: Jim – Jim Peterson, can I ask you to address in particular from the viewpoint of Canada vis-a-vis being the smaller of the two partners what has posed particular problems for the current administration in Ottawa?

HONORABLE JIM PETERSON: Anytime we don't act in unison on this issue we are going to go backwards, or we are not going to make the progress that we should be making, and so you heard earlier about the cooperation at the scientific level. But at the political level, we are doing diametrically opposed directions, and we even have some dissent in Canada from the provinces. There are four provinces that are all conservative, which are not going along with the national effort, which had been worked out previously. Where does this leave us? Jim talked about what industry is doing in many cases and subgovernments, but I think we have to put in there, too, what is it that we, as individuals, can do? And just a very fast list. Our air conditioning and our heaters in our homes, can we walk and bike and take public transit as opposed to driving our car? Can we get electric cars? What about

solar panels and geothermal? What about switching to green suppliers of electricity?

Let me quote to you somebody, this was Alfred Russell Wallace who wrote in 1903 "Man's Place in the Universe," where he talked about the foul effusions of the industrial revolution and how they threaten humanity.

And his concluding remarks were "vote for no one who says it cannot be done; vote only for those who declare it shall be done."

And so also, we can ask every one of our politicians at all levels, what will you do, and more importantly, what are you doing in your own life to deal with these carbon problems?

Just to conclude here, both Prime Minister Thatcher and Prime Minister Blair were very concerned in their times about climate change, and I don't think it is any surprise that with leadership coming from the top like that, that some of the local councils in the UK dropped their emissions by 70 percent.

CONSUL GENERAL COMARTIN: Peter, I think Jim raised the issue of what's going on in Canada with the difference between especially around the carbon tax. And I don't know if I am supposed to call it that but the dispute over how to handle this with four of the provinces, Ontario eating away, but Manitoba, Saskatchewan, and New Brunswick opposing the government plan.

I guess along the same lines where the President and his cabinet is leading it on the U.S., so any comments on that?

MR. MacKAY: Sure. I would love to take that on, and personally, I am glad you did take the appointment that you did, although I think you would have been a good judge.

(Laughter.)

MR. MacKAY: I feel a little bit like the old Sesame Street adage, not like the other as a conservative on this panel. And so I am not here to defend the White House or any particular province, but what I will say is it is very much a matter of leadership, and I also very much associate myself with former ambassador's comment about the necessity -- and this isn't optional in my view -- it is going to require a North American approach, and we sometimes in the former NAFTA forget Mexico's role in all of this.

And we are a continent, and so I think we should be also looking for ways in which we can involve Mexico, although they have bigger challenges to be sure.

The question of leadership is going to be about embracing some of the technology in my estimation as opposed to the forcing of responsibility on those who are perhaps least able to make the necessary adjustments.

By that, I suggest that cabinet disproportionately hammers rural people, whereas the majority of the emissions -- and look, I am no scientist, I might be able to talk about political science -- but the majority of emissions it would appear are going to be coming from bigger urban centers, and yet, those who have to travel, those who have to produce food, those who are most responsible, quite frankly, for feeding the planet are going to disproportionately pick up the slack in the proposed carbon tax arrangement. So there is going to be court cases in Canada, in fact, and that's how adamant some of the provinces differ on the approach.

I'd like to take perhaps a different angle or tact on this, and this is try to incentivize. Jim, I think, Peterson has touched on a lot of the personal responsibility items that people can take on, but there is also ways in which government can encourage and incentivize.

One of the elements that is often left out of the equation -- and I talked a little bit about this to Dr. Takle last night -- is hydro. I am very proud of the conservative government's support for the lower Churchill and Muskrat Falls initiative, which is the largest hydro project on the planet, and many people are not aware of that. There is enough energy upon completion to basically energize the entire East Coast of North America when it comes on line. It is a large perpetual energy source. Interestingly, also, it is going to receive greater water sources because of melting water, melting ice I should say. A very compelling point that was made by John Godfrey last night in his remarkable address was this perpetual election cycle, and this is where the politics very much does impact how we bring about collaboration, how we get to a unified North American approach, despite who is in the White House or who is at 24 Sussex.

But we are in this campaign cycle now that begins after a government is elected, and the subject of governors very much impacts on whether we have a consistent approach to climate change among many other things, but the good news is, there are ample examples of where Canada and the United States, in particular, have addressed big climate change issues. Acid rain is probably the best example we can point to.

There is examples of collaboration that is ongoing, and Joe, you would be very aware of the International Joint Committee, which deals specifically with some of these issues in a very unified way. I am also encouraged, as we all should be, here we are on a university campus in this beautiful setting, the academic cooperation across border. Fantastic.

Chambers of commerce, non-governmental organizations are doing remarkable work in collaboration, even when governments are wrong footing each other or not working together in a way that would bring about or accelerate perhaps, so it is down to a personal level. Where leadership fails in politics, I think you are seeing, thankfully, a lot of these other organizations pick up the slack. And finally what we are seeing in technical advance is breathtaking in terms of new ways to reduce emissions, in ways to recycle energy, to have waste through energy programs that come on line. So government can do a lot and should do a lot more and should step up, but in the absence of that, I don't believe that all is lost.

I think for certain we have tremendous leadership on so many other levels that we will hopefully bring around the thought leaders at the top politically, and if not, democracy will prevail, and we may disagree on who should be driving the bus, but the people will decide.

CONSUL GENERAL COMARTIN: Jim, do you want to start?

GOVERNOR BLANCHARD: Yeah, I do. I am optimistic in that regard as well. The tone at the top, particularly in Washington, is not good, but you know, having served as ambassador and worked on U.S. Canadian issues since the '70s, I worked on acid rain when I was in Congress. The cooperation of our departments, our agencies is ongoing everyday.

As we speak, there are several heads of agencies or offices in Washington on the phone to Ottawa. It is at every level. The cooperation goes on and on and on, and it is very good. Of course, we heard about the scientific community as well. I think that's the good thing and that's going to continue. It would be helpful if we had a better tone at the top in Washington. I have two or three just miscellaneous things.

Number one, having lived in Canada and been in the energy business in Canada, Canada is far more dependent, the health of Canada's economy is far more dependent on fossil fuel than the U.S., it really is.

And that's a serious political challenge for any government in Canada, and it is not an easy one to deal with.

I would also like to say in terms of cooperation, Lana Pollack is here from Michigan. She is chair of the U.S. side of the International Joint Commission, three members from the U.S., three from Canada, and they deal with the boundary waters and many other things, Great Lakes issues, but they always look at environmental impacts, and Lana has been a leader in the environmental area in Michigan.

What's interesting is that boundary waters treaty, which created the IJC as I recall, it was 1909. I think it is probably the first environmental agreement between two countries anywhere in the world.

So we have been cooperating on this for a long time, and that's going to continue. The final thing I want to say is, I want to brag about my nephew who worked for years in environment, Canada, and my other nephew, his brother, who is a cardiologist, teaching cardiology and hypertension at the University of Michigan Medical School, they have collaborated on the impact of air quality on cardiovascular disease.

And their conclusion is not just wild swings in climate impact, the health of the heart and the lungs, but -- and I would like to hear this from our previous speaker -- short term greenhouse gases are a severe threat to cardiovascular health. I don't ever hear anyone ever talking about the fact that climate change can have a direct impact on human health.

It isn't just, you know, the change of conditions that affect our lifestyle and our business and our industry. More needs to be said about that. And the other thing we need to talk about -- look, we are not scientists here. We are political people, government, public servants. We have got to convince the public this is really much more serious than they realize, and we have talked about that, but one way perhaps is to explain, look, you see how good the weather forecasters are today? They used to be lousy 20 years ago. See how good they are today? You count on them, and they are usually accurate.

Well, those same people are telling us that climate change is a serious challenge. So you know, it is right in your face. You know, don't be a denier.

So that's just kind of some miscellaneous thoughts I have. Other than being from Michigan, we don't need electric cars if they are powered by coal-fired plants, folks. That's a nonstarter. So we need other sources.

CONSUL GENERAL COMARTIN: Peter?

MR. MacKAY: Well, I agree with so much of what was said, particularly the impacts on human health. We are all trapped in our own experience. I grew up in a small town on the East Coast, and the major employers were rail car factory, coal-fired generator, and a tire factory, all of which were big emitters.

And, you know, I hear with great alarm increasingly from people in my community that have unusual high instances of cancer. And so there is an undeniable connection to what's happening, and you only have to go for a jog in Beijing to realize the impact on human health, and suffering is undeniable, but therein lies one of the problems, is this symbiotic relationship that we have with countries who Joe pointed out at the outset are not playing ball. They are not signatories to COP 21 in Paris or Copenhagen or other international conventions. They are not even trying, quite frankly.

They are moving in the other direction. They are building coal-fired generators at an alarming pace, similarly in places like Pakistan, India, despite what they may say, and there are worse offenders as well. They are not moving in this direction.

So what do we do about that? John Godfrey's answer, I think, is the right one, in part, which talks about again incentivizing through technology and making their economy respond out of necessity.

If we can bring technological advancements, whether it is electric cars, whether it is changing how we can feed the grid and making it much more economically feasible and viable and making -- marginalizing those countries' economies, quite frankly, I mean, again, this is not a partisan but perhaps a regional perspective, in Canada, we hammer our oil industry, quite frankly, and there has been a lot of statements made about the Oil Sands in Alberta.

And so we leave it in the ground, or we send it at a massive volume discount to the United States of America where the United States is on the verge of surpassing the Kingdom of Saudi Arabia and Iran if they haven't already as becoming the world's number one producer of energy, and we are giving our energy to the United States.

And what are we doing to our own population? We are buying it from Venezuela or indirectly from places like Iran or Saudi Arabia and then criticizing them about their human rights. And so we are hectoring the world and telling them they have to do better on the way they pollute or treat their populations, and yet, we are dependent on them for energy.

When we have the capacity we know not only to produce it but to refine it. And also, like the United States, the exporters, we could refine it on the East Coast, and this also has geopolitical implications because if Canada and the United States are able to supply places like Germany, France, and Italy, they don't buy from Russia who invade neighboring countries and who are not interested in climate change or the effects on humans.

So we have to, I think, be at least honest. I mean, we saw a very factual presentation, but we need to put facts on the table about what we are doing ourselves if we are going to realign our economies and we are going to actually take this on because, you know, writing a certain number in the Paris Accord as to what we are going to achieve and then coming back home basically not doing

much is like driving 200 miles on the seat of your pants, and say you can run that fast. It is not going to happen.

CONSUL GEN COMARTIN: Jim, I see you were making notes as Peter was speaking. So I don't know if you wanted to jump in at this point.

HONORABLE JIM PETERSON: All right. I would be delighted.

First of all, with respect to what Jim said about healthcare being affected by climate change, on February the 19th, the healthcare community met in Ottawa, February 19th of this year, the doctors and nurses and everybody else, and they outlined a lot of the pathologies that are taking place because of that climate change today and how it is going to get worse in the future.

Certainly, what Peter said about looking quite ridiculous I think in the eyes of the world, we are exporting about 3.7 billion barrels of oil, and we are importing at the same time about a billion barrels of oil, and we have got this incredible facility in St. John that is providing petroleum for East Coast and for Quebec and for Ontario.

Anyway it just doesn't make sense. I would like to go back to just one thing, Joe, and John's wonderful address last night. He was asked a question afterwards about, well, how do we get the world to come on side when there are so many poor countries? And is it going to make them poorer if we start to limit carbon emissions?

Well, about 15 years ago I think it started there was a movement that came out called contraction and conversions or C & C, and basically, it involved what looks like -- somewhat like the carbon trading today. You would have an international agreement, including all the Third World and developing countries to cap CO2 emissions in the air.

Secondly, you would estimate how quickly those emissions must be capped to reset target. Well, we have already done these two things just very recently at the meeting in Ottawa and elsewhere.

Thirdly, you would create a carbon budget from those figures and divide it, not among countries, but among every individual in the world, including those in the developing countries, and this would mean that those in the highly emitting industrialized countries would have to pay the developing countries money to get the credits that they would need. So that to me is not terribly alien from the cap and trade programs that we have been looking at already but on a more limited scale. So I would just like to throw that into the bundle of tools that we might have in the future. I am probably not as optimistic as Jim and Peter about a saving resolution to this whole thing.

I have heard the same types of reactions back in the 2005-2006 years when things were proposed and planned, and there were no actions that were taken. We are -- they would have been so much easier had we started earlier, but we are now in a very steep curve of about 11 to 12 years to meet our 2030 deadline.

And the trend is not great in terms of what we are doing. I think we are going to require more and more drastic actions to do it if we are going to meet those targets. And I think the world now pretty well recognizes, apart from a few sceptics and others, that that climate change is manmade. It is of our own doing, and we are sealing our own doom.

Now, what the hell are we going to do about it?

GOVERNOR BLANCHARD: You know, I want to mention, it is interesting that you mention, China and Russia not really being on board. The reality is we still have to lead by example, which is why we want to get things straight in Washington. We need to lead by example. Regarding China, I mentioned my nephew, his name is Dr. Jeffrey Brook. He is recently retired from environment Canada. He now teaches at the University of Toronto.

And I mentioned he is a leading expert on air quality and also the cardiovascular effects of that. So he was commissioned by the Chinese government to go to Beijing and monitor air quality before the Olympics because they were really worried the world would arrive, and you wouldn't be able to see for more than 200 yards.

I mean, it is really bad there, so they banned all cars for like several months to try to get the air quality better, and he went over there and measured it for the Chinese government, brought over there. Of course, he said it was awful, but his observation was that they continue to build coal plants and other things.

The health effects alone are going to start to affect their population and life span, and they are going to have health reasons to change their ways. It is going to be right in their face. They are not going to have a choice at some point, so it will be interesting to see.

The only other thing I want to mention is, I want to mention a guy that I served with in Congress. His name is George Brown. He was a Congressman from California, and he was a scientist. And he was chair of a subcommittee on environment and the atmosphere and the science and technology committee.

And I was a young member of that committee, and he started talking to us about climate change, and this was in the mid '70s. And so he drafted a bill that ended up becoming the Federal Climate Program Act of 1978. Actually, it became law, and it called for all these studies on what's going on with climate.

So George Brown knew all about this way back when. I am glad I put my name on the bill, one of many co-sponsors. It actually became law, but even then, we had people saying, well, we are going to have a new ice age probably. He was saying, well, the science appears to be warming, but let's look at it. Let's study it. Let's give grants to the scientific community to look at this.

So there have been people even in the political system, other than George Brown of California, who were worrying about this, and they have been around a lot longer than perhaps George, but I just want to give hats off to the guys who are no longer with us, but he was a wonderful public servant, and I am just glad he cared about it.

CONSUL GEN COMARTIN: In that regard, Jim, I guess the dispute that is going on between the federal government on the U.S. side and the state of California in terms of what's going to be the targets for emissions and efficiency of the thermal combustion engine, I mean, there is a gap between what is the national position and what is state of California.

We tend to be on the Canadian side, tend to be more to what California is trying to do as are a number of other states. Any sense of what the backlash will be?

GOVERNOR BLANCHARD: I don't know. I side with California, but I don't know.

CONSUL GEN COMARTIN: Peter?

MR. MacKAY: Well, I side with California and Canada. I think we are well beyond spinning our wheels and talking about what the causes of climate change, whether it is real. I think everybody here -- and this presentation was compelling -- you wish time and time again you could confront those who are saying it is not happening or it is not happening as presented. You wish you could just confront them with those facts and say "look, we have to move beyond that."

And to what Jim said, this is now a reaching, very urgent state that is going to require action, and it is about action as opposed to the words. There is endless debate that goes on, and while we may be talking a good game -- and I know the diplomatic thing is never to disparage your own country or another country when you are a visitor -- but we are talking a lot and not doing enough. And I think the United States is actually doing more and talking less, although there is a negative connotation around the discussion.

And so you know, I remember something my grandfather used to say, you know, the best time to plant a tree was yesterday, but we can start today. And so we should be planting a lot more trees by the way because that is one of the small things that can be done in places like Haiti and others and has a massive effect on their soil and their erosion problems and the same with the coast lines.

But it is getting those great minds, and if they are not political minds, get the great science minds, get those technical advancements, get the private sector, look at what works and what hasn't worked, and try to bring about greater motivation.

And to that end where I draw, I think, tremendous hope -- and you can't live without hope for clean air -- is millennials because millennials do get it. I mean, they are sometimes ridiculed by people of another generation, but there is a sense of urgency among young people that I think doesn't exist perhaps.

You know, there are lots of notable exceptions, and we have lots of people in this room who have been at this for a long time and demonstrated leadership against, you know, the opposition, but I think young people, as a young generation, do understand the global commitment and urgency that is going to be required, and they are going to emerge. There is going to be an emergence of leaders from that generation who are going to, as the saying goes, put this at the top of the priority list.

John's point, again, has been referenced here as our speaker last night talked about the necessity of bringing government departments together around this issue. So it shouldn't just be the department of environment agriculture; it has to be financed. It has to be across a whole of government approach as he described it.

That's the only way that you are going to be able to move the machinery of government to get behind the necessity of prioritizing climate change in the number of issues.

The problem, of course, is that people don't want to vote against their own personal impacts. I mean, why do people smoke? Everybody knows it is going to kill you if you keep at it, but you know, when it impacts you in your own home

and you say it is going to cost me more to drive to work, it is going to cost me more to get groceries, the carbon tax debate that goes on in our country is completely focused around that. And everybody would love to drive Tesla, but it is not affordable.

So maybe the government has to look at incentivizing things like public transit. They have to look at doing more in terms of the cycling, incentivizing people to exhibit good behavior. That's where government policy can impact, and you know when we see electric cars they are coming on line.

I was at a Stanford energy conference last year. These companies, these car companies get it. They know that we can't continue to produce internal combustion engines. They recognize -- and they are pressing it, they are ahead of the curve, quite frankly, with their technical advances, but it is getting those advances to an affordable place and having more people make those adaptations in their day-to-day life. That's what is going to, at least, start incrementally bringing down the climate change.

HONORABLE JIM PETERSON: Our recent budget, they are offering $5,000 bucks for an electric or hybrid car under $45,000 Canadian. And I think that's a pretty good incentive.

I want to say that in talking to people in Canada about what we should be doing, I have often been met with the thing, well, it really doesn't matter because the rest of the world is not in sync and will be doing nothing, and -- but I agree completely with what Jim said, that we have got to lead by example.

How are these other countries going to get in line if we are not there? If we are there, we can at least shame them into coming with us, and we can have incentives to make it good for them to do it such as C & C.

I think Peter and Jim both mentioned this, how the know-how evolution of knowledge and technology in this area is going to be perhaps a real game changer. One area where I see it right now and it gives me a hell of a lot more hope for India and China getting on board is taking place in a company called Global First Power Nuclear. They have -- what they do is, they grind up the fissionable material, the enriched uranium into very small granules, and they coat it with graphite and silicone.

Now, in so doing, there can never be a meltdown. This stuff burns at 800 degrees centigrade as opposed to 2,000 in conventional reactors, such as Three Mile, Chernobyl, and the Japanese, which were meltdowns. This can't melt down.

Secondly, it cannot be used as weapons grade material.

And thirdly, it is replaced only every 20 years as opposed to every 18 months with conventional rods, and so -- and if a terrorist attack were to take place, yes, it would be scattered all over, but it would not be emitting any radiation.

So I think something like this can be a real game changer because, as you know, it is -- it doesn't emit CO2, and I am slightly more optimistic than others are about China and India because they have such a long way to go, and these new technologies are going to be absolutely what they need.

And you can build them in module sizes anywhere from five megawatts up to 500, and so the price of them is going to come way down, and they will be

encouraged to use these as opposed to setting up grids that don't exist for huge coal generators.

MR. MacKAY: The technological advances are undeniable. Plastics, there is an island the size of Edward Island floating around in the Atlantic made up of plastic bottles, and it staggers the mind to think that we can't find a way to recycle in a more effective way and turn it back into energy.

The Arctic ice melting, there is a really interesting company, not surprisingly again out of California and connected to Stanford where that has come up with a silicon based sand that you spread over Arctic that slows the melting.

The research there has been remarkable in demonstrating how the Arctic ice core at least -- it helps to reflect the warming on the ice that is causing some melting. It is not going to reverse it. It is not going to stop it, but it will at least, again if nothing else, buy us some time.

So that technological edge is going to get sharper, and we need to support and resource and develop it if we are going to turn back this rising tied, pardon the pun.

CONSUL GEN COMARTIN: Jim?

GOVERNOR BLANCHARD: Couple snippets: I mentioned George Brown of California. Of course, he was in the state legislature before Congress and smog was everywhere in the Los Angeles area. You don't hear about that now, but you can understand why people of California were much more militant about dealing with environmental issues and energy issues.

I want to mention a couple other things: For those of us who forgot, you know, government can have a strong impact. If you look at the antismoking campaign and the surgeon general reports of the United States, it had a huge impact on eliminating smog and regulating smoking areas; the same thing with seatbelts. You know, when we started out with seatbelt requirements, everybody thought you can never force the drivers to use them, but it worked.

So antismoking and seatbelt requirements are a classic case where government with strong action can have impact. It just takes time. And you don't want to be too creechy.

MR. MacKAY: Now we are telling them to use marijuana instead.

(Laughter.)

HONORABLE JIM PETERSON: Instead of smoking tobacco.

GOVERNOR BLANCHARD: That's a whole other -- the traffic is slow in Toronto they tell me. So anyway, the final thing is we haven't mentioned the Green New Deal. All right. So there is like a hundred members of Congress who signed on to a resolution called Green New Deal. I am not sure, I tried to look it up, and I am not sure all that it means other than the aspirations most people feel are quite good. The critics will find stuff in there that is unrealistic, a timetable that is probably not realistic and discredit it, but it is another example of politics and young people and leadership having an impact. It will have an impact, and it is going to affect our presidential race.

So we will see what happens, but those are all signs that people are getting really worried, particularly newer younger members of our Congress.

CONSUL GEN COMARTIN: Can we talk a little bit -- I mean, we have a federal election coming up in Canada in October of this year and, obviously, a

federal election on the U.S. side of the border in 2020. So it is a year-and-a-half away.

Any thought on what the impact is going to be of climate change as an issue in those two elections?

HONORABLE JIM PETERSON: The polls in Canada show that it is in the top three issues for electors in Canada now, and I think it will become even more so. And I think, as younger people who are taking the lead on this continue to do so, parents are going to change, and so I think they will be demanding that we have people who meet this -- I call it a crisis that we are in right now.

MR. MacKAY: I think it will be a top issue for sure. If the economy continues to worsen, it drops, and that's unfortunate because I think, you know, it has been said by many people and in many spheres of influence that you can have complimentary prosperous economy and take these necessary steps.

In fact, the innovation technology piece, which requires investment, also creates prosperity, jobs, opportunities. That's the sort of creative piece that has to somehow be woven together with economic times, hard times, and a change to a green.

And the problem again is the level of cynicism. You know, we are going to change our democratic process. We are going to do certain things within a certain budget, and then it doesn't happen. And so there is a very skeptical public when it comes to politicians, quite frankly, deservedly so.

And so until you see demonstrative action I think on the environment, again, the problem -- and there is a lot of toxicity around politics right now, but the worst thing that can happen is people say that's it. I am in and out. I am not going to vote; I am not going to participate; I am not going to get involved, and this is this terrible cycle that I fear we could enter, and young people have a -- you know, having said I am optimistic, and I mean, there is a much shorter attention span, and with a greater sense of urgency also comes impatience.

And so I fear they are going to turn away or look for other way to have impact outside the political system, whether it is through NGOs, whether it is through their own work in their community.

So low voter turnout is something that could be a problem in our upcoming election, which is slated for October, but it could come sooner, and our system, of course, elections can be triggered by events.

CONSUL GEN COMARTIN: We have some of those going on. Just on that point, Peter, and I have been involved in the environment movement since the late '60s, periodically, it comes to the fore. I am in the environment, I am rejecting being involved in partisan politics, doesn't do anything, any thoughts on -- and it is fairly pervasive right now within the millennial generation of just backing off and saying I will go work on the community groups and other environmental groups, but I am not going to be involved myself on the political to influence policy and hopefully policy that is favorable that deals with the crisis.

Any of you as to what you say to people?

HONORABLE JIM PETERSON: Well, you try to scare them as well as this morning's speaker scared us. That's the best thing we can do for them at this point.

Let me -- in this whole debate, I am taken back to what happened in the Second World War in the United States. There was a hell of a movement for the United States not to be involved.

President Roosevelt against the wishes of all of Congress got the United States to be in very quick time the biggest supplier of tanks and planes of anybody in the world, and without that, the Second World War would probably have ended in another way.

Germany made had a huge -- Japan made a huge mistake in getting the United States in the War and gave us an excuse to do it. But up until then, they had been -- they were just turning the armaments that kept the Allies alive, and I think it is that type of effort that is probably going to be required.

I mean, John was quite right. There is no timeline to this. Well, we have to make some timelines that people will stick to.

MR. MacKAY: There isn't any leadership for sure from the United States. I mean, we can do our part, and I think we do to a large degree. The military comparison is interesting because the biggest, the largest consumer of energy on the planet is the United States Army. Think about it. They are the largest single consumer of energy.

So there is a stated interest in having the U.S. fill the void on some of these leadership positions, which they have in the past, certainly militarily and in other spaces, and the fear that they don't is in the void. Who fills that void? Often it is Russia, China, some of our less aligned, less friendly nations, so there is a concern about that.

But again, I don't want to see our government or our country turn down the road of hectoring without having a legitimate say we are doing our piece as well whether it is at a NATO table or whether it is on the climate change initiative. We have to have credibility in the world.

But back to your point, Joe, about how do we ensure that young people don't turn away? Your party, frankly, has been the best at engaging young people. The problem again is on the delivery side and having the capacity to make sure that they don't feel disappointed, that it hasn't actually lived up to the commitment, and that's where it becomes problematic.

If we are not able to actually gain some ground on these important issues, there will be discontinuation of low voter turnout.

CONSUL GEN COMARTIN: Jim?

GOVERNOR BLANCHARD: I want to again give you some good news; that the election in the United States from last November had a huge turnout by historical standards for a mid-term election, and actually, the gains by the party out of power -- what I mean by that, the democratic party were equivalent of gains during Watergate.

The difference, though, is we had a relatively strong economy, and yet, the Democrats made huge gains in Michigan. The turnout was greater than any mid-term election since 1962.

We are trying to figure out what the youth participation was, youth 18 to 21, 24, but I think it was up, and I think it will grow. If you do a poll now of voters,

yes, the number one issue is still jobs and the economy, and it usually is but not like it used to be.

It is health, which is important in the United States of all the debate about healthcare, universal healthcare, affordable healthcare, but the third comes up as registering climate change, which used to never register at all on the Richter scale.

And as I mentioned, you have at least one candidate that is making that exclusively as his campaign. So I think there are a lot of really good trends. And I think we are going to elect a new president. I think a year ago you all heard me say we were going to have big mid-term gains by the Democrats. We are going to elect a new president, and all of a sudden TPP and NATO and the Paris Calamint Accord with trade expansion and working with the world -- I will repeat that, working with the world, and Canada will be popular again because we will have a leader who believes in that, and that's how I see it.

(Applause.)

CONSUL GEN COMARTIN: We lost track of time there, but we have about five minutes, so we will take some questions. Over here.

MR. VASARAIS: Thank you panelists. My question is, we have an Attorney General and ambassador and foreign minister of national trade here. You all alluded to the idea there are significant health impacts. Last night John Godfrey spoke to central climate refugees.

So the big question is, we can get the machinery of government in order, but how do we get the machinery of the private sector in order? Companies have vails that protect directors from liability.

So the question is, you look at climate refugees, you look at the presentation from this morning, and we look at the potential impact of the United Nations. Does this climate change or is this climate genocide? If it is a genocide and it is declared a genocide, what are the legal and trade ramifications of that?

MR. MacKAY: Well, I will take a shot at that. That's a massively important question. Part of the answer is, of course, the movement towards more corporate social responsibilities, and does the UN have their social development goals, which are aspirational, and in short, there has to be more enforcement and more sanction around that.

And at the top of the social responsibility goals to your point, it has to be efforts of enforcement around being good climate citizens to prevent the type of displacement that we are seeing, which is massively displacement in large part because of conflict, and again, it is interesting to look at some of the military studies.

Come of the best minds around social change and climate change actually are people who have served in uniform because they have been in many parts of the world where they have seen the impact, and they have come to the inevitable conclusion that we are on this catastrophic track. Shortages of water may be the next big world conflict.

They themselves as military are also big consumers of energy, and they know that that's the way from a military standpoint that you keep the advantage. If you have the ability to mobilize and to make advances ahead of your enemy, you win the day, but I remember something General Mattis said in context of the Iraq

Afghanistan conflicts, he said the most important six inches on the battlefield are between the soldier's ears, which is applicable across any subject. It is how we are thinking about these things.

So to answer your question from a justice perspective, I think we need more enforcement on the emitters, the big emitters. I think there needs to be punishment, quite frankly, for those who pollute and those that take advantage. There has to be on those who participate in human trafficking or who have exploited practices in labor. There has to be a consequence.

I would rather see more emphasis on the incentivization, but if you are on the other side of criminal behavior there is a sanction, and that has to be in the corporate world as well.

To your point, corporate liability now can make its way all the way back to the board room. And I referenced my community, we had a mine that blew up in my community and killed 26 men. And they tried to prosecute the company, and the whole prosecution ultimately collapsed under the weight and complexities and delays. And so our laws have not been keeping pace with that imperative to hold corporate corrosion and their boards of directors and decision makers, allowing them to hide behind the corporate vail has got to stop.

HONORABLE JIM PETERSON: Isn't there an action right now against Exxon in the courts because they understated the impact on climate change?

MR. MacKAY: Well, Volks Wagon is a good example.

GOVERNOR BLANCHARD: I think there is an investigation in New York State with the Attorney General on that. I am not positive, but yes, the answer is, I think so at the state level.

CONSUL GEN COMARTIN: Okay. This will have to be the last question because we are out of time.

MS. KOWALSKI: Thank you for a very interesting panel. My question focuses on the discussion of the carbon tax, and there was a report from CDP a couple years ago showing that 70 companies -- or I'm sorry -- a hundred companies were responsible for something like 70 percent of global greenhouse gas emissions.

So I guess my question is, if you don't have a carbon tax, aren't you kind of letting those companies and other large fossil fuel emitters continue with externalities, which are kind of another way of saying free loading and not paying their costs, and shouldn't we be doing that?

HONORABLE JIM PETERSON: I think you are making a very strong case for putting a price on carbon. Everybody -- I think most big businesses would accept it. I think the question is under our federal program now it comes on at $20 bucks and goes up to $50 bucks in 2022.

There are many critics who are saying it will not have an impact unless you take it to $200 bucks a ton. So let's see. At least, the government can reevaluate what it is doing in a couple of years, to see if it is working.

MR. MacKAY: The trouble with an across-the-board carbon tax in a country like Canada is we have a relatively small population for a massive geography, and we are a cold country. So we are putting tax on people who live in a cold climate that don't have an option but to heat their homes.

So it is very punitive, and you are going after a significant population that live in rural communities that have to drive to go to work, they have to heat their home. They don't have the option to use perhaps natural gas or in some cases alternative sources of in many.

And so currently, you have three percent of the Canadian population, three percent paying three quarters of the tax for the entire country's revenue. So you are disproportionately hitting a population in my view without taking the broader view that you need to put that burden to a large degree on the emitters and on the source as opposed to those who are just trying to scrape by and make a living, drive their pickup truck 200 miles down the road to go to work. And so it is a fairness issue as I see it. I think there are cap and trade issues. There are incentives dealing in urban centers, but that would never apply to rural communities. So I guess you look at it from where you sit.

I represented a rural community of fisherman, farmers, people who basically could least afford to pay more tax because they are already paying a lot of tax.

CONSUL GEN COMARTIN: Okay. On that note, join with me in thanking the panelists for their contributions.

(Applause.)

MR. PETRAS: Let me thank you all for paying attention. That was great.

GOVERNOR BLANCHARD: Thank you.

MR. PETRAS: All right. Everyone, we are going to take a five-minute break and start with our next panel ten minutes from now.

(Recess had.)

PANEL DISCUSSION –

CLIMATE CHANGE, POLICY, AND LAW: WHAT NEEDS TO BE DONE, AND HOW CAN IT BE ACHIEVED?

Moderator: Lawrence L. Herman

Speaker: Martha Hall Findlay

Speaker: Commissioner Lana Pollack

Speaker: The Honorable John Godfrey

MR. HERMAN: Okay. Ladies and gentlemen, if we could resume please. All right. We will start our next panel, and leading into the discussion let me just say a couple things:

First of all, I want to thank Dean Michael Scharf and Case Western Law School for all they have done in supporting the Canada-U.S. Law Institute and with a tremendous team headed by Steve Petras, including Chi Carmody on the Canadian side and Ted Parran, I think they put together a wonderful program this year, and I am pleased to be part of it.

You know, one thing that should be understood is that, while we are called the Canada-U.S. Law Institute, we talk about things far beyond black letter law. We talk about policy issues concerning Canada and the United States, and I think that has to be appreciated by everybody; that it is not just a bunch of lawyers talking about statutes and regulations.

We deal with issues of policy that are timely and pertinent and need to be discussed. And we are unique. This is a bit of advertising, we are unique in the sense that I don't think there is any other institute that deals with Canada-U.S. issues as we do. So just tell your friends and if you are not members of the Institute, I urge you to take up the membership. It is a wonderful body. It has been around as we know since 1976, and we want to continue for another 40 or 50 years, if not more.

The other thing I should say, I am a stand-in. Chris Sands, who is the director of Canadian studies at John's Hopkins School of Advanced International Studies could not be here, largely as I understand it due to 737 issues. Transportation was just impossible to get him here on time.

Chris Sands is one of the most well-informed experts on Canada-U.S. relations, and I am humbled by being asked to stand in for Chris, but here I am.

So let me now talk about the panel. We have had a discussion already at high political levels, and now we are going to drill down a little bit and talk about certain

specific laws, policies, instruments, that can be used to deal with climate related issues and we have a first class panel.

We couldn't be better served than having Martha Hall Findlay, Lana Pollack, and John Godfrey on the panel. Now, you've all got written material in front of you, so you know their detailed bios, but let me just introduce them very briefly.

Martha Hall Findlay, who I have known for many, many years, is a leader in public policy thinking in Canada. She has been a member of parliament, and she has had activities in the private sector as legal counsel in the information and technology business.

She now heads one of Canada's premier think tanks, the Canada West Foundation based in Calgary, and I might add that we are so pleased to have Western Canada represented here at our annual conference.

Next to her is Lana Pollack, again a leader in policy, someone who has served politically in the legislature, and as you heard from Jim Blanchard, who stole my lines a little bit, he often does in the legislature in emission, she has had a major role in policy development both in her state and at the national level, and she is now the Chair of the U.S. section of the International Joint Commission, an incredible institution formed by Canada and the United States in 1909, a groundbreaking body dealing with environmental boundary water related issues.

And when you think about it, well over a hundred years ago there was a bilateral body constituted by the two bodies to deal with common problems, and Lana will talk more about that in due course.

And finally, if I may, next to her is John Godfrey, who we heard last night and who kindly consented to do double duty today standing in for Joanna Dafoe, senior policy adviser in the environment industry who could not be here. John, in his biography, again someone who has served in government, a member of parliament and in the academic world, he was also editor of the Financial Post before entering politics, and he recently chaired the task force for the government of Ontario on environmental issues. So John, we are very pleased you are able to take up this double duty role this morning.

So let me start the discussion -- and by the way, I should say each of the panelists has agreed to limit their formal remarks to ten to twelve minutes to allow us to have enough time for an exchange with the participants, with the audience, and I want the students particularly to feel free to ask questions.

In fact, we encourage the students to take an active role in the question period that we will have after the opening remarks of each of our panels. So that being said, let me start with Martha Hall Findlay and ask her for her opening comments.

Martha?

MS. FINDLAY: Terrific. Thank you very much, and thank you very much to the Canada-U.S. Law Institute. It is a real pleasure to be here. I don't get to do the lawyer part of my role very often, so I am very much looking forward to this and to the discussion with the audience, and I do thank you for noticing the Western piece.

I do really think it is really important even at home and in Canada and find it frustrating often a lot of these discussions don't, in fact, include different regions

of the country, and as you know, it is a really big country because it is big like the one here in different perspectives and some are often important.

I actually changed my notes for this morning based on the earlier discussion and based on, John, your comments last night and, in particular, appreciated the emphasis on the opportunities for cities, for municipalities, and towns to be engaged. So I have brought it into three components.

One is a little bit of an optimistic piece that certainly from our perspective what is really changing things is not, in fact, government regulation, is not, in fact, specific approaches that are political or governmental or even legal, an awful lot of the change that is happening worldwide is happening because money talks.

And the more conversations that we have been having with the global investment community, particularly in energy, that's an area that we are involved in, so that happens to be a big part of the global investment community's focus, and frankly, Canada is not seen as a very good place to invest because a lot of our activities have been -- in fact ground to a halt.

There are some environmental activists that might think that that's a really good thing because we are not actually able to export a number of our energy products the way we might like to, and we can talk about that in a minute. My point is, whether you agree or disagree, I am very positive and hopeful that what we are hearing from the investment community and, of course, they are reflecting not just the desires but increasingly the demands of their sources of money.

So pension funds, individual shareholders, consumers who drive behavior of that, in fact, then makes investment decisions because, of course, you want to invest in companies that are addressing the needs or desires of consumers. So that's one point I want to, make and I am very hopeful that a lot of change is happening because of money. And indeed, in the Canadian energy industry -- and you know, there was some talk about it before, and I think Jim Blanchard pointed out that an awful lot of energy companies are, in fact, leading the way in renewable energy.

So it is a bit of an unknown thing and perhaps a bit counterintuitive, but money talks, and they know that the future is there as well, and so there is terrific investment in wind and solar and geothermal and in hydrogen and all sorts of really, really interesting things.

So what I would like to say -- and that goes a bit to Peter's comments about the optimism around technology. Technology and technological innovation even in the Canadian Oil Sand has now brought oil sand oil to be lower in GHG emissions than California heavy crude, than the Venezuelan options that we are quite happy to import.

And so to the extent than even the oil coming from the Oil Sands, you might not like the fact that the world is using oil. We would love to actually see an alternative tomorrow, but that's not going to happen, and to the extent that the world is going to continue, like it or not, to use and consume fossil fuels, at least for the foreseeable number of decades, a few decades -- don't get me wrong, we can all say we would love that not to be the case, but the reality is -- and somebody asked the question last night, too -- we have to recognize that there is energy poverty around the world, and it is a little rich, pardon the pun or maybe pun

intended for the developing world to say it is okay, we have done all of this damage.

You can't have cheap and readily accessible energy because it happens to be fossil fuel based. And so to the extent that we are recognizing that that will still be the case, I am really excited that what's happening from a technological perspective in terms of reducing the footprint wherever we can in the context of realizing of what's happening in our consumption. But investment is driving those innovations.

It is interesting that companies are realizing that doing the right thing as in reducing greenhouse gas mission footprint is also lowering costs. And in juries, even in the last few years, the mindset and the realization that these are win-wins is really quite extraordinary and is going to continue at pace.

The next piece I wanted to talk about was, in fact, politics and where we have encountered a problem -- and I have to say I quite a few years ago was part of an effort in Canadian politics to implement a federal carbon tax.

I had significant scars on my back from that effort because it became so politicized, and I now see -- and let me just say we lived through a year and somewhere the slogan became job killing carbon tax, and it took hold. And it ended up, I think, putting the effort years back, in fact, to actually get to the point where we can implement a price on carbon. The unfortunate thing -- and again this is the politicization in the fact that politicians can't -- if you go to the table and you say "I am right and you are wrong, we are not going to compromise," we are not going to get anywhere frankly.

And so now we have a situation with the Canadian federal government where a new attempt to bring in legislation -- and I will talk about C-69 but not now because I think it is an important part of the discussion --legislation regulatory legislation and after that add a carbon tax, but frankly, it was done too ideologically. It was done without recognition that certain regions and certain parts of the country -- we need to understand more how to manage different regions, different needs, rural versus urban.

And unfortunately, it was done in such an ideological way that it basically handed the opponents of carbon pricing another opportunity to go down the path of the political slogan of job killing carbon tax.

And so unfortunately, because of the ideological I-am-right-you-are-wrong approach -- and this is nonpartisan or maybe multi-partisan, everyone is guilty of this. It certainly is in our country, and as a result, we are not getting far enough forward. And so we really do need to find a way to find compromise and collaboration. I would finally add my -- because I realize we are short of time for these intro remarks -- but I am just going to add now in terms of where we might be able to cooperate because that is the title of the conference, I am going to set the stage with just a scenario to offer the question.

The Paris Agreement, everybody who signed on to it, we all have set ourselves targets for greenhouse gas emissions, but they are territorial targets. They are not consumption targets. They are actually production, and they are territorial based.

So here is a dilemma for Canada and the United States where I think may be an area for potential cooperation. Canada is trying to build a natural gas pipeline

to the West. We have tons of pipelines by the way. We have tons of natural gas pipelines, but we are trying to build another one to a plant that can actually create liquid natural gas, which we would like to be able to export to China.

So if we look at global greenhouse gas emissions which, in fact, what we should be looking at is global reduction, that reduction of global greenhouse gas emissions, to the extent that there is an argument -- and I think it is a very strong one -- that cleanly produced LNG displacing coal-fired electricity in China is, in fact, a very good thing, even though liquid natural gas is a fossil fuel, and it does use some to actually create -- make it liquid. But if the net result is reduction, that's great, except the system we've -- we have now after Paris doesn't actually allow us to really calculate, well, if there is a net reduction in China, but it actually means a net increase in GHG emissions in Canada, how do we settle that?

But that same pipeline, if in building that pipeline we use Canadian steel, then we actually, if we want to attribute, we want to calculate the GHG associated with that project, we have to include the greenhouse gas emissions associated with the fabrication of that Canadian steel in Canada.

I am fine with that except that the way the system is structured, if we import American steel, we don't have to include those greenhouse gas emissions in terms of being associated with that project. That doesn't make any sense to me.

So I think -- and I throw it out -- there is some interesting work being done in this area. There is an opportunity I think, whether it is Canada-U.S., I would prefer to think perhaps North America, would want an opportunity to figure out how we can actually make some horse sense out of what we are trying to do in terms of a larger effort to reduce greenhouse gas emissions.

MR. HERMAN: Thank you. Very well done.

MS. POLLACK: Thank you very much, and thank you for inviting me here. I am pleased and honored, and most importantly, I am learning. I have been with the IJC for nine years. It is a relatively long period of time for a commissioner if you look over the last 110 years.

In that time, I have been with the commissioners that have been hyper appointments, working with Obama people. Now, we still have Obama people, and there is Trudeau administration, but they have yet to make their appointment. So we are effectively shut down and waiting for the government of Canada to make those appointments.

So I say that because it is important, and we have important people here, and I hope you will carry that back because the longer we are not in session, the less relevant we become, the less helpful we become, and I think we have a history of being very helpful to both countries. So that's out there. I know they are distracted, but I don't think there is any controversy. It is just distraction and other business. So okay.

IJC works, of course, all the way across the boundary, certainly in the western basins and as far East as St. Croix, New Brunswick, and Maine, and we have witnessed and lived with the people there who are suffering today and yesterday from -- and indeed, the whole nine years I have been on from the consequences of climate change. There is extraordinary flooding. There is extraordinary flooding sometimes followed by drought in the same year.

There are all sorts of consequences that are costly and harmful, and IJC is frankly helping. We are the only organization that can work with environment Canada EPA at the same time, fisheries and oceans and the interior department. We do all these things, and we are quite effective.

And I will go into some of the programs and policies that we have helped these agencies and governments, jurisdictions both at the provincial and the federal level, developed and defined to better deal with -- that is to say to adapt to the consequences of climate change.

They are there. I am proud of that work. Everybody who has been associated certainly are extraordinary staff and boards who both volunteer their time and -- well, they all volunteer their time. There has been improvements.

We are like our governments, both governments are pretty good at adaptation. We are lousy, and I would say irresponsible in, as our governments, in addressing mitigation.

Now, I also want to pause and say what I should have said at the beginning. There are people in the offices, civil servants and people in Ottawa who get very nervous when I talk. Mark don't laugh.

And so I want to make clear, these are my comments. You know I respond to the IJC. I represent the IJC, but everything I say represents the positions of the IJC. When I say the IJC like our governments should be addressing mitigation, the reduction of greenhouse gases as well as adaptation, which we are doing very well, I mean, I am proud of that. It is pragmatic. It is helpful. It is cutting edge stuff in these various basins.

But when I say that, I am not speaking for the IJC because the IJC doesn't deal with mitigation. We just deal with consequences, and I am here to say I think it is time that everybody deals with the cause as well as the consequences.

I am also here to say that, as Jim Blanchard I think pointed out and John also, it is hard to deal with consequences, and it is going to be particularly hard, I understand, for Canada because I believe a larger part of the Canadian economy and also more geographically concentrated development of the energy, that's real. Those are real lives. That's real economies, that's real.

But that doesn't mean we can wait decades and export Canadian Oil Sands to China or LNG to China. We can't do it, or we will have what I haven't actually heard, and I am speaking for myself, not the IJC, the term "climate change" or "climate genocide."

We do not have the time, and so -- I mean Millie and Sam, my grandchildren, a year old and almost three years old, how many people have here have children or grandchildren who were born in this century?

(Showing of hands.)

MS. POLLACK: So they are virtually all going to live through whatever it is we bequeath to them. And we don't have the time to wait. We can't delete that stuff in the ground, and we have to recognize the economic impact on those regions especially and those individual people who are going to be bearing the brunt of this massive essential readjustment.

We can't just let the people who -- as Peter said, you have to drive 200 miles to work or 200 kilometers to work. I mean, they drive a long way. They are poor. They can't do it.

But that doesn't mean, oh, therefore, we can't do it. That doesn't mean, okay, we will stand by and let the seas rise and the ice melt and the glaciers disappear in the Himalayan mountains so that billions of people in Asia will be without water. Try that for an immigration consequence.

I am full of admiration for your prime minister, especially in contrast to our current president. As you know, Canada has embraced Syrian refugees who aren't climate refugees essentially.

But I would ask, quiz time as Professor Takle said today, you are looking at -- and this is -- and I think he would agree this is IPCC's assessment, and every mark that the IPCC has had since going back to its establishment, we have overshot it because IPCC is an extraordinarily conservative consensus driven organization.

So if IPCC says we have got about a meter to go in Sam and Millie's lifetime of sea level rise and it is very likely to be more, who in this room -- for those of you who know don't get to answer this -- who in this room can say what a meter of sea rise represents in terms of climate refugees? What's the number?

(No response.)

MS. KOWALSKI: 50 million.

MS. POLLACK: How many?

MS. KOWALSKI: 50 million.

MS. POLLACK: Do I hear another number? Hundred million. The United States couldn't even deal with a hundred thousand refugees in New Orleans a few years ago. This is hard stuff, and if we think we are going to do this and wait -- and this is my last, second to last comment for time -- if we think we are going to wait to benefit the people of Zimbabwe and Mozambique because they haven't had a chance to develop, are we doing them a favor today?

They are bearing the consequences of waiting. Yes, they need energy, but they can't wait to have energy the way we have energy. The poorest on the planet will surely suffer the most. So when we are thinking we are delaying in any way because we are helping the undeveloped, I think that needs to be reconsidered.

But what I would say is -- what we all need to do and our legislators need to do, our leaders need to do, we need to say, yeah, it is going to hurt Calgary a lot, but that doesn't mean -- and many other interests in people a lot -- doesn't mean we can't figure out a way to have a carbon tax or some other mechanism and still take the burden off the poor people who have to drive the distance to work and heat their homes from a distance with something not as good as we would like.

The last thing I will say before we have our conversations is, we are treating the atmosphere like an open sewer, and that also is not an IJC position or statement. But it is a true statement, and we have to stop thinking it is free.

If we had people upstream of us, if we are a city living with people upstream of us and they start dumping ethyl methyl bad stuff -- I am not a chemist -- in the water upstream, the best action shouldn't be to pass out water filters to the people downstream; we should do something upstream to stop the stuff going in in the first place.

And it is costly, and it is hard, and it is disruptive but not nearly as much so as doing nothing in greeting those hundred million or 200 million climate refugees.

Thanks.

MR. HERMAN: Thank you.

John?

HONORABLE JOHN GODFREY: Well, thanks very much, and before I say anything, I want to recognize that John McKay has arrived, and it is also his birthday.

Happy birthday, John.

So I want to basically try to be an over the horizon radar person. You know, over the horizon radar sees things that are beyond the immediate horizon, and in a way what I want to talk about are two things, which have been referenced this morning, one by Martha and one by Karlis.

I am going to try two sets of initials on you. Who knows right off the top what BCA is? How wonderful. We have got something to talk about and learn about. Who knows what these initials stand for, TCFD? Oh, even better.

So this is really going to be stuff that is coming as that, and you will have to take into account where policy will have to become law I think, but it is not on your radar right now.

GOVERNOR BLANCHARD: So those are basketball teams?

HONORABLE JOHN GODFREY: They are.

GOVERNOR BLANCHARD: They are not even in the March madness.

HONORABLE JOHN GODFREY: So the first one, which is BCA, is border carbon adjustment. What is a border carbon adjustment? It relates to the problem that Martha raised. What do we do with the CO2, which is embedded in U.S. Steel but would have to compete against Canadian steel, which has been penalized for the CO2 that is embedded within. How do we make that fair?

Well, that's a really great question because it is not just about U.S. Steel; it is about imports from any part of the world. So, for example, when the United Kingdom says, well, we really reduced our greenhouse gas emissions; no, you haven't. You actually just transferred it to China where you bought a lot of stuff which you imported, which doesn't count in your CO2 emissions. It is just simply a transfer from one place to another.

Well, one of the interesting projects, which folks are working on, is this very problem, which is, how do we make it fair?

Now, when Ontario was doing its cap and trade scheme and California and Quebec as well one of the thoughts was that you would spare trade exposed sectors. So in other words, in the steel question, in the steel case, even though you recognize that in Canadian steel there was a certain percentage because you didn't want to wipe out the Canadian steel industry or Canadian cement industry, you simply gave them free allowances, to allow them to transition to some future date, and therefore, you didn't open yourself up to these foreign imports that didn't reflect their carbon content.

The alternative strategy, which folks have been working on, and if it were an easy strategy, I am sure it would have been adopted by now by more, is to bring in a border carbon adjustment. What that means is that you ascribe to an import of

U.S. steel, a certain amount of carbon that you simply say, well, unless you can prove to the contrary, we will assume that you used up this much carbon, that much is embedded in your product, and until -- you know, you will be penalized for that the way our own people are penalized.

You will be given an actual treatment, so there is a certain logic to this; that you are treating everybody the same, but you are ascribing to the foreign importer a certain value.

Now, that may seem a little arbitrary, but happily the international organization of standard, the ISO has been working on this problem, and they are developing methodologies that are now ISO standards, which are life cycle, so they take into account the raw materials, the processing, the transportation, and by the way, you know, the disposal at the end of the life.

There are measures which allow you to assess what other people's products are in terms of their CO2 emissions, and that the trick would be you would say, well, look, we are not discriminating against your import, but we insist that you reveal how much is in your product, and then, you know, you will be treated exactly the way we treat our own, whether it is through a cap and trade system or carbon tax, so there is an equalization.

Now, this implies eventually a certain kind of interference if you like because it means you have to be able to know what happened to that plant in China or wherever else, but we do this in other sectors. We do it for child labor. You have to prove a certification that your product was not the product of child labor, and so this is -- it is complicated, but it is intriguing as a solution to the problem of carbon leakage or displacement or unfair trade. So that would be my first point. Keep an eye on that one.

And as I say, there is a more and more sophisticated response to that. The trick is you have to allow for inspectors to go in and see exactly what's going on. You can't simply take the foreign plant at its word that it is low producing in carbon dioxide. So that's the first one. Border carbon adjustments are kind of an interesting solution to carbon pricing, number one.

So the second set of initials was the TCFD. So TCFD is the Task Force on Climate related Financial Disclosure.

Now, you think now that I have given the fuller part some of you know about this, this is a product of the Financial Stability Board, which has been headed up by Mark Carney, again the Canadian foreign governor Bank of England and Michael Bloomberg. So they about two or three years ago commissioned, created a new financial task force to deal with two problems, how as investors do we know whether public companies and particularly financial institutions, how are they doing in two areas? How are they doing in mitigating the production of greenhouse gases? They call that transitional risk.

How do they assess the risk of a company, which is really exposed to having a lot of carbon in its portfolio. That's the first point. And then, the second risk is physical risk. How do companies reveal how exposed they are to interruption of business, for example, because of extreme weather events.

So these two risks are now confronting the corporate world. And so what the task force said was, no longer will the directors of public companies be able to say

they didn't know because they do know. We have told you, everybody else has told you, the science is getting stronger. It is undeniable. You can't claim you didn't know. That's not going to be a defense in the future.

And what you do about it has to be reflected in four elements of corporate policy. It has to be reflected in your government structure. It has to be reflected in your risk management plan. It has to be reflected in your strategic plan, and it has to be reflected in the various indicators you use to tell investors and the world about your company.

So this report came out about a year-and-a-half ago, and it has had a profound effect. First, about 400 corporations have signed up around the world to do this, and secondly, naturally, the financial regulators are looking at this and saying, well, in the past language about climate change and environment was kind of descriptive.

In your reporting structure, it was optional. It was not really something you would be held accountable for, but increasingly, they are going to say this is approaching a material risk. This is a material fact, which investors must know about if they are going to make sensible investments. And what's going to be really important, of course, is that boards of directors are going to be held liable.

They are going to be -- if they do not produce that kind of disclosure on both kinds of risk, the carbon risk and the physical risk, due diligence, it will be determined they haven't done their due diligence.

And I think this is going to the way of tobacco, that increasingly you won't be able to get away with it, to try and deny it or to push it aside or not take it into account.

And when I was listening to Karlis suggest one approach might be to declare this a form of genocide. That's a pretty high standard, and it also raises all kinds of emotional issues, and it is probably true, but it is challenging, and I think probably -- and I will let all of you lawyers tell me in more detail -- it is probably at a much higher burden of proof.

But if I take it down to disclosure of your vulnerability on carbon and on physical risk, then we are at a much lower burden of proof.

And by the way, with every passing climate event, it just becomes that much more obvious that you can't ignore it. So these are two emerging areas, which I think will, first of all, become policy and eventually become law.

And it will not be limited by the way to simply corporations themselves; more importantly, the financial institutions, which are funding and investing in those corporations.

So it is really at the financial services level, the insurance business, the pension business, the investment business, the banking business. They are all going to be covered by the task force and climate related disclosure.

And it will be a rising pressure as it was in the past with tobacco or investments in other things. It is a coming thing, and we should keep an eye on it, and I think it is only going to go one way.

Thanks very much.

MR. HERMAN: Thank you, John, and I thank all of the panelists because, as I watched them on my stopwatch, they all kept within their allotted time, and they

came under the 12-minute threshold. So that being said, I am going to give each of them, each of them, one minute to comment on what they heard the others say.

So, Martha, please begin.

MS. FINDLAY: Thank you. Task force, it is not just risk. That's the focus of the task force, which is fantastic, but what I was alluding to earlier in terms of a global investment community, there is also a reaction to other, whether it is investors, consumers, not just saying oh, oh, risk, they are saying we want you to behave better. We want you to be greener.

So there is a negative, there is a disincentive, and then there is an incentive, which I think is incredibly valuable, so thanks for elaborating on the task force because it speaks to my earlier point: Money talks, and money is actually going to be hugely influential here.

I don't have enough time -- one minute doesn't get me enough time to talk about what has happened, a fantastic innovation, based here in Cleveland with respect to water. So I will do that later in the panel.

So I do just want to talk about the issue about trade exposed and what the ISO is doing. It is the ISO 14,000 Series of their standards. It can't just be trade exposed. It can't just be a border adjustment because those still end up being territorially based issues.

The ISO is not a government body. It needs for some of that extremely important work to work we also need the political collaboration, and I know it is tough because Paris was tough enough to get. We all know how hard it was to get global agreement on anything, but because the commitment was to territorial based production of greenhouse gas emissions, in order for us to take full advantage of what the ISO is doing in terms of addressing my steel challenge, we are going to need broader political collaboration to say it is not just an economic trade exposed; it is also how do we account properly for our collaborative effort, not yet collaborative efforts, but other collective efforts, even if they are calculated individually to reduce greenhouse gas emissions.

So anybody interested in the ISO, it is a 14,000 Series, really, really interesting work, but it can't work without that political collaboration as well.

MR. HERMAN: Lana?

MS. POLLACK: I would like to pick up on something both of my colleagues have said here. One is, what we do has to be fair, and you mentioned, Martha, this -- that tax wasn't going to be fair. And once people believe something is not fair, they should fight it.

So we need to watch our language as well as the content of how we present our ideas. So that's one thing. At the very least -- and this isn't -- I just started writing what you could call it, but until you come up with a better, it should be a fair carbon tax, and you could come up with something better, but it should be fair, and it should be represented that way.

The second thing is what -- when John started talking, you know, he is a really nerd and brainiac, and that's what we need. And, Martha, you lead, you know, an institution full of brainiacs, and so what we need to do is settle on what needs to be done as a society, and as a global community, and stop fighting about what needs done.

Start getting realistic on the timeline that needs to be done and put the kind of brains that I am sitting between to work on how to do it. There is too much time spent, well, we could wait, or we can do it. It is over here. The Mozambique people only had one cyclone, and we need more farmland to grow more corn, not to eat but to burn.

Let's figure out what needs to be done because there really is agreement on that. The hard thing is the policy. There are wonky things that will work to make it fair, and the last -- my last point is, because I like to go back to IJC, because I am not talking a lot about it, and yet, I am so proud of what we have been able to do in looking at adaptation.

One of the things we called for and not specifically with relationship to climate change but as extended producer responsibility, which is another way of saying the life cycle tracking, and with the ISO and all the things that you've mentioned, that is a mechanism. It is a policy mechanism that could be developed much more strongly and could be a substantial contributor.

That is in the first IJC's annual TAP, Triannual Assessment of Progress report. And it is a concept worthy of considerable development. Canada, I think, is a little ahead of the United States in various ways in applying that principle in different provincial law and programs.

MR. HERMAN: John?

HONORABLE JOHN GODFREY: Well, very quickly, I just want to pick up on something that Lana said, which, of course, is all about part of the work that IJC -- part of the folks on the Great Lakes, and I just want to point out to one significant information gap, which makes it difficult even to relate what kinds of risks we may be exposed to, which is that certainly in Ontario and may well be the case here in Ohio as well, we lack something called down-scaled climate data.

We know quite a lot about what's going to happen in general terms as Gene pointed out, and this does really relate to Gene's as much, in general terms over the next 50 years in terms of increased water, increased storms, heat waves, all the rest of it. What we don't know is how it is going to play out on about a five square kilometer footing.

But there is incredible work going on and particularly a guy at the University of Toronto who is a physicist, which builds on work, which is being done in Quebec, a climate modeling collaborative, to be able to do what they call dynamic downscaling, which allows you to understand what happens when all of the various complex things are happening in the atmosphere and they meet the surface at that interface.

And one of the extraordinary things that happens at the Great Lakes level is that the Great Lakes throws everything off. It would be like if you had mountains, it would be the same kind of challenge. So you get snowfalls of zero percent in Niagara on the Lake and Lake Ontario, and 50 kilometers to Buffalo you get six feet of snow. That's lake effect.

And anybody who is a skier by the way in southern Ontario knows a lot about that.

So we in order to make the kind of plans for adaptation and resilience -- so if we are going to build a new piece of infrastructure, a bridge or anything else, so

we want to know what the new reality is about a hundred-year storm or wind or anything else. We need that kind of data in order to plan period of time and protect our population from what's coming at us. Weronose has a long history of this, but it is huge super computers with all the rest of it, and the rest is needed as well, and we need it by the way for any of our financial institutions, which are investing around the world increasingly in infrastructure and real estate because the same arguments apply.

If you are going to buy a port in Sydney, you better know more accurately about sea level rise and sea surges and all that kind of stuff because it will affect our pensions, right, and increasingly, we are investing around the world, thinking that it is safer to get into infrastructure and real estate than stocks and bonds, but it is actually worse because it is being subjected to increasing extreme weather events. So that's a missing scientific piece, which we need to focus.

MS. POLLACK: Can I say just one quick thing? I would say that the scientists and investors and certainly the reinsurance companies are way ahead of a lot of other people who are either denying or fussing with detail. The politicians in their wisdom -- and I don't want to get the wrong state, I think it is South Carolina, but it might be North Carolina -- they have created a law, a requirement that no plans for future ports, roads, infrastructure can include presumptions or assumptions that there is going to be any change in climate. They have to use the last hundred years. You can't use science be damned. I'd say the voters really need to look at who they elected.

MS. FINDLAY: So as frustrating as that is, can I just get permission from our chair to actually tell my story about what Ohio and, in fact, Cleveland did the opposite not too long ago?

So there is an old friend of mine now passed away by the name of Bill Pryor. He was co-founder of a company called Conetico, which is known as a worldwide company in terms of water treatment, lot of residential water, water treatment, but also to the municipal size water treatment activities.

And one of the things that they developed a number of years ago, not too many years ago was a system that Bill used to call toilet to tap. And I told him many times that's probably not your best marketing slogan.

But the point was that they had developed water recycling, one of the original technologies in terms of membrane for water treatment years ago, but this newer approach was a full closed loop opportunity, and there is a residential house that has been operating, and I am not sure where it is here in Cleveland in a small commercial property that has been operating entirely closed loop for the last several years.

So I am talking -- I am not just talking gray water. Recycling gray water has been around for a long time; I am talking entire closed loop with, you know, the toilet piece into completely purified water and dry waste.

The opportunities for this technology are huge, but what they came up against was a regulatory barrier that in Ohio you could not use anything that related to sewage.

So anything that had been through or been, you know, had been or been through, you could not use it regardless of how pure the ultimate water was. They

worked for years to get the legislation changed to say, but if the science shows that the water is pure, then we should be able to do this.

Ultimately, the Ohio -- is it legislature? -- anyway, the Ohio government in its wisdom not only overturned that regulation but did so unanimously because the science was overwhelming to say here you have an opportunity, a full total closed loop water recycling technology that you can actually now use.

Now, Bill passed away a couple years ago. It is not -- you know, the company is in a lot of transition, but the opportunity -- think of that as an opportunity, not from just having recognized the science but the opportunity for the world in terms of small community recycling.

Like I said, you might want a different slogan, but the opportunity is terrific. So that's an example, a positive example right here in Cleveland of where government and politicians have, in fact, been able to embrace an opportunity. I am hopeful. I mean, notwithstanding whichever Carolina it was, there are good stories, too.

MS. POLLACK: Of course.

MR. HERMAN: So we are going to go to you for question and answer period. Let me just make a comment: If you followed the progression of our discussion from last night to now, you see that we talked about the need for global intergovernmental action, fundamental need for countries of the world to do something on a common and serious challenge.

We have talked about the need for governmental and intergovernmental action at a more specific level. We talked recently last few minutes about community action to deal with the issues, and we've talked -- John has mentioned it -- we talked about corporate action, and we've explored each of those levels, and I think that that has been a very good development as we progressed in these discussions.

One of the things that I think that has -- that needs more attention by everybody involved in climate change law and policy is the impact of private sector regulation, which has kind of been ignored in the discussion but, you know, there are private sector standards not related to government legislation.

And one of them is the whole area of corporate social responsibility where corporations are judged in the marketplace on what they are doing to deal with climate change issues, not because governments have forced them to do that but because the markets have dictated that their stock price will depend on how effective their CSR programs are, and that engages things like labor relations, standards and environmental issues that a particular company is pursuing.

As I said, not because governments have dictated it but because the markets have, and I think that's an area that needs further explanation. Anyway, that being said, let's start having some vigorous questions. Over here. Yes, sir.

MR. PETRAS: Larry, if you could please identify yourself –

MR. HERMAN: Yes.

MR. PETRAS: -- for the questions, that's all.

MR. DELAY: I am Brendan Delay. I have a question on science.

MR. HERMAN: Sorry. The mike doesn't seem to be on.

MR. DELAY: Delay. I have a question on science. One of my college roommates is a laser chemist at Rutgers University, and his colleague just won the

Nobel Prize for chemistry, Don Strickland for laser chemistry, and we have been talking a lot about climate and lasers and how they are now measuring what is happening that comes from the solar system, from the star system.

And what's being found from the NOAA satellites is that the outer two layers of the atmosphere, the ionosphere and the exosphere have been cooling. And there have been cases that the cooling started four years ago, and the cooling is getting cooler in the last two years.

So that's now being an issue handed over to the solar scientists to say what is this happening with the solar cycle?

And some solar scientists are saying that a cooling trend is happening, and it is somewhat slight right now, but it will grow. Now, I am not a solar scientist, but could it be that this may be leading to a cooling of our lower levels of the atmosphere, may be giving more time to deal with these climate effects, so we are not talking about climate genocide?

MS. POLLACK: I think we need Gene -- Professor Takle on this. Can you respond to that?

MR. HERMAN: Come over and have a mike. Give him the mike.

DR. TAKLE: This is the first time I have heard of that particular issue. I should say, however, that there are -- at the time as we measured that the troposphere, the lower atmosphere is warming, we also know that a natural consequence of that is the stratosphere's cooling.

But that is driven by the greenhouse gases. I think what you are saying is that there may be something in the output of the sun that is interacting with the exosphere and ionosphere -- well, the exosphere is probably not at issue.

Those molecules are leaving anyway, but the ionosphere, the upper stratosphere, I don't know about that, and I don't know how strong that connection is with what's happening at the surface. So we are talking there about very low density environment.

So you know, even though it might be warming so to speak, but molecules are so far apart that what we mean by temperature is even called into question. So we would have to look at the magnitude, the amount of heat -- I mentioned zettajoules in the ocean, and so we need to compare the amount of energy that is either leaving or entering there with the amount of energy that we already have stored in the ocean, for instance and maybe could compensate for that.

It is something that definitely needs to be looked at, but I think we have to make sure we are talking about comparable amounts of energy so we can make decisions about what happens here that is going to affect us. It is going to affect human society over the next hundred years.

MR. HERMAN: And this is a good example of a discussion that should be taking place offline between the two of you.

DR. TAKLE: This is kind of wonky stuff, but it is the kind of thing that needs to get into the scientific community because this is what scientists gravitate to. Here is the new potential area of uncertainty. We need to get on that right away.

MR. HERMAN: Jim Blanchard. Thank you, Dr. Takle.

GOVERNOR BLANCHARD: Great Lakes, my law partner, who you all saw last night, was honored with the Henry King, Jr. award, has been worrying about

lake levels near his home, near Lake Ontario, and Lana and I know about those along Lake Michigan, the models on climate change suggest that a warming because of evaporation at a lower level, Gene, but Rick Newcomb is worried that they are rising and driving him nuts.

In fact, that was a factor in the selection of this topic for our conference. So Lana, commissioner, chairperson, others, what say about lake levels and climate change?

What is going on?

MS. POLLACK: Well, I will say that I am one -- well, I will say a couple of things: One, I bet everybody from Governor Cuomo to the town supervisor on the south shore of Lake Ontario plus all the people up in Georgian Bay a couple years ago were calling for my head.

You know, they are all wrong, IJC, and if we only change the IJC commissioners, we won't need to worry about -- I swear -- we won't need to worry about, in this case, high water levels on Lake Ontario. And to give them just a little context, the IJC is under the treaty. We set the orders on dams, where those dams are shared dams binational dams. So when the St. Lawrence Seaway was opened, new dam, new order on that dam, goes back to the '50s. And putting the dam in and with the orders, which is to say how many gates you open under which conditions, how much flow you allow under various conditions, which is the IJC's work that has to be also approved by both governments.

So what the dam did and the order did was eliminate 98 percent of the flooding downstream of -- no, not downstream – 98 percent of the flooding in the basin, Lake Ontario and the upper St. Lawrence. Ninety eight percent wasn't enough. People were not happy because there was still occasional floods.

As professor Takle said, the lakes varied between five -- up to two meters. So you are trying to compress it, and the lakes are too big. The main driver, Jim, is precipitation. It is also impacted by how much ice cover there is, how much evaporation is, but it is the amount of precipitation. When you have a lot of precipitation, it runs into the lakes and guess what happens? The lakes rise. When you have little precipitation, the lakes go down. The dam can only do so much.

We changed the order on the dam after 50 years of debate and discussion and $20 million dollars of Canadian-U.S. money on a study because the 1950s order compressed the waters unnaturally, and by so doing compromised 64,000 acres of wetlands, because in the '50s, no one paid any attention to the environment and wetlands.

Come to my term of office, this period of time, the IJC with lots of study, lots of public input changed the order as the scientists would say, and in that sense, we got unlucky because we changed it on January 1st, 2017, and then it started to rain, and it rained for 40 days, and it rained for 40 nights, and it was an unprecedented amount of water, climate perhaps. And I am not making light of the people who got flooded. I am not making light of that. That's a very serious thing to go through. Oh, my goodness, it is a terrible thing to go through, but I am saying when it rains, you are likely to have flood, and changing the commissioners on the IJC is not going to change the water levels nor will it make them go up in Georgian Bay under low water periods.

We spend -- last thing -- we spend so much time fighting reality and too little time figuring out how do we adjust. In this case, that's where the work on mitigation -- excuse me -- adaptation is terribly important. We can do more for the people on things to help them live with it, but what we can't do is change the water levels.

MS. FINDLAY: Can I just have -- I have lived for a long -- most of my entire life with Great Lakes water levels, particularly Georgian Bay, and the IJC cannot win because you are dammed if you do, and you are dammed if you don't.

HONORABLE JOHN GODFREY: And you are dammed if you are dammed.

MS. FINDLAY: And you are damned if you are damned.

(Laughter.)

MS. POLLACK: Very good.

MS. FINDLAY: But I think -- but I think this is where science is so important because water levels in Georgian Bay, Lake Huron go up, and we have only been measuring since the late 1800s.

Let's acknowledge that's a small amount of time in our history, but it has been over a hundred years that we have been measuring, and if you look at the charts, it goes up.

Anybody that does any boating or whatever, the charts acknowledge this. It is a six foot range, but if you look at since we have been measuring, the only thing that you can conclude is that it goes up and down a lot. So the historical lows were in the 1920s, the 1960s, and about five, six, seven years ago it went down.

It didn't stay down as long and as low as in the 1960s by the way, but this is where the science has to be the base because people can get really upset at their own rules.

Right?

MR. HERMAN: Sure.

MS. FINDLAY: So the historical lows, '20s, '60s and a few years ago a few people bought property on Georgian Bay when the water was high because the highest record, highest levels on record were in the 1990s to the point where national geographic had to cover, oh, my God, we are being inundated.

The thing is Georgian Bay has rock and Lake Huron has soft shore. So when the water was high, people on the Lake Huron side of the shore were losing their cottages, losing shoreline. Panic, panic, panic. What are we going to do to stop the waters being so high? You fast forward about 30 years because the cycles -- the only thing you can conclude is the life cycles go up every 30, 40 years.

So it is a long cycle, and truth be told, nobody really understands why. Of course, it is precipitation, but what causes precipitation? Nobody really knows what it is. But we just know that this happens.

But this is where you have to rely on science because you get people panicking about when the water then is high, they are losing shoreline, and to Georgian Bay a couple decades later, panicking because the water is now low, and they didn't actually do the research and bought a cottage that was far from the historical or they bought a boat that was too big for the channels, and now they are panicking, right?

But they are the ones who drove to the point of wanting to sue the U.S. Corps of Engineers for having allowed the water to drop. I mean, in both cases, the important part is to say this might be affecting you, but our job is not to shake the environment to suit any particular vested interest.

We have to go back to the science and say what is really happening and why? And water levels in Georgian Bay and Lake Huron are the best example of how people -- we end up with people reacting because of their own vested interests or because of their own personal experiences without being able to step back and really look at the science.

And I feel for the IJC. Like I say, they have been damned because they have done, and they have been damned because they have not done -- grammatically, that was a challenge, but you knew what I meant.

MS. POLLACK: Thank you.

MR. HERMAN: Now, excuse me, panel because Professor Colares has been very patient. He is waiving his hand. He wants to ask a question, just lean over.

PROFESSOR COLARES: Thank you. Case Western, Professor.

I posed a question.

MR. HERMAN: Wait, we need a microphone.

PROFESSOR COLARES: I was at the American lawyers conference, ABA, where I posed the question that the Honorable John Godfrey mentioned as border carbon adjustments, and although I believe climate change is happening, I do believe that we need to discuss what we shouldn't be doing about it.

And I was quite sympathetic to the idea in the beginning before finishing the research of eventually making the legal case and the economic policy case for BCAs, and unfortunately, although I succeeded in finding a way of demonstrating how that could be made compatible, how BCAs could be made compatible with WTO obligations --

MR. HERMAN: Do you have a question, of course?

PROFESSOR COLARES: Yes. So the question is the economic case is disastrous. Recently after Professor Bill Nordhaus won the economic prize, the Nobel Prize in economics, there was some controversy disagreement between major controversy, including Dr. Nordhaus and the IPCC in terms of what would be the best policies to address.

The IPCC seems to be addressing an agenda like what you propose as deep carbonization, which would be according to the economists on the issues, would be disastrous to the world in terms of economic loss. So my question is climate change is definitely a political problem, and it is in the political arena that these issues need to be debated, and this is where I think that panels like this are very important.

My question to you is, what do you think -- how do you -- what are your ideas of making climate discussion and consideration of costs of decarbonization, relative decarbonization and open the discussion to the public, and what is the likelihood of actually having that being done by people who are in the politics and Congress?

Thank you.

MR. HERMAN: Well, now, in asking for the panel to respond, note that there is only two minutes left in our time frame. So keep your response within that, if you can, please.

HONORABLE JOHN GODFREY: So two minutes, it is going to be like IQ. It would seem to be we are be balancing two kinds of risks. It is not simply a political challenge; it is a physical challenge. It is a scientific challenge. It is absolute disastrous we are facing if we don't do something.

So you say to yourself, well, if we simply can't manage this economically or industrially, we will just have to keep going. That's not an answer. I mean, it is obviously -- so what it does require -- and we talked a little bit about this last night -- is a transformational act of our economy, which changes the basic assumptions about how we use energy and materials.

That's what it comes down to. And we don't have a choice, but we didn't have a choice in the Second World War either about what we needed to do to produce armaments. We have the capacity as a human society to organize ourselves for these crises when we recognize them.

And so, of course, if we stick to an industrial paradigm, which will produce disaster, we will produce disaster, but we can't afford to do that. And happily in the history of human kind, we are ingenious people, and this will summon up all of our ingenuity on a global basis, and we will have to get it right together. We don't have -- we don't have a choice, so we have got to find a way to do it.

MR. HERMAN: Any final observations, Lana, Martha?

MS. POLLACK: My observation of this meeting is among the best I have been to. I have been going to climate change discussions -- I am married to a climate scientist -- and I have been going to climate discussions since at least 1990, actually very earlier than that, and I really respect what I am hearing and the seriousness and the wisdom with which you are offering these ideas.

The last point is, a week ago I was able to hear Christianna Ferrous, who is the UN ambassador for climate change and a major figure in the Paris Climate Agreement, and she said that she -- gave a marvelous talk, almost as good as John Godfrey's -- and she said "I am a stubborn optimist. I have to be," and all 3,000 people went out of that big Hall and saying "we are stubborn optimists, we must be." So I leave you with that, and perhaps we can all be stubborn optimists in how to proceed.

MS. FINDLAY: Can I finish also with a note of optimism? In Canada right now, the federal government put forward a massive piece of legislation, which we refer to as Bill C-69, which has -- will have tremendous impact on what we do in terms of environmental assessments, making it much broader into full impact assessments, changing how we approve of energy projects, pipelines, transmission lines.

It is a massive piece of legislation. We have a current government that is very concerned about climate as they should be. The legislation was somewhat ideologically driven and was responded to by industry very, very negatively.

So a few months ago or like 18 months ago we ended up with very polarized positions on a major piece of legislation that will affect the next, at least, decade

of how we do things in Canada. The positive piece about this is that over the last number of months and Canada West Foundation has been very involved in trying to moving this forward. We -- it looks like now through a lot of discussion and a lot of collaboration between industry, between other people concerned, between them and government that we may end up getting a piece of legislation that is significantly amended before it finally passes that will not be perfect. And that might not sound great, but the fact that it will have been reflective of compromise and collaboration on the part of all concerned, we may very well -- and I am crossing fingers over the next number of months, and it will be just the next couple of months -- we may end up with a massive piece of legislation in Canada that we can then go to the rest of the world and waive and say are we ever proud of the fact that this is not perfect in the sense that we can have industry go out and say not perfect, but at least we can live with it.

We have environmental activists who can say not perfect, but at least we can live with it, and then go back to the investment climate, which is saying we need you to do this kind of thing.

I am crossing fingers. A lot of us are working really hard to make this happen, but if we can, should be by the end of June that will actually be an example of how we, when you want to add politics and the law and science, it could be something we are really, really proud of. Classic Canadian will really be proud of something that is not perfect, but I think it could be really something.

MR. HERMAN: Well, I am really proud of our panel that has been perfect, and I want to thank each of you, Martha, Lana and John. You have been excellent, and we have profited by your wisdom. Thank you very much, and now, Steve, over to you. You tell us what we have to do.

MR. PETRAS: Well, first we need to thank the outstanding panel.

(Applause.)

MR. PETRAS: And I need to thank Larry Herman for doing an outstanding job.

(Applause.)

MR. PETRAS: All right. So it is now lunchtime. What we are going to do, we have lunch set up out there so you can go through the line, grab your lunch, drinks are over here, come back and sit down, and at about 20 after 12:00, we will start the afternoon lunch program where we will have our presentation from the Honorable John McKay.

(Luncheon recess taken.)

GREETINGS FROM OHIO SENATOR SHERROD BROWN

MR. PETRAS: Well, good afternoon, everyone. If I could have your attention, we will -- we are going to start the afternoon program now. I have one question, David Terry, if you could identify yourself, you need to speak with Dick Cunningham right there --

MR. TERRY: Okay.

MR. PETRAS: But welcome, everyone, to our afternoon session of the Canada-United States Law Institute. At this time, I would like to recognize certain individuals with respect to this conference. And first of all, I want to recognize the executive committee, which really functions as the board of directors of the Canada-United States Law Institute, which is an institute between Case Western Reserve University School of Law and the University of Western Ontario's faculty of law. So I am going to read out the names of our executive. If you could stand when I read your names. All right. Dick Cunningham, Larry Herman, Jim Blanchard, James Graham, Raul Rosado, Jim Peterson, Selma Lussenburg. I just saw Selma, she is not here right now. Rick Newcomb, yeah, Rick; Diane Francis, who unfortunately can't be here; Chris Sands, who cannot be here, Peter MacKay, Chi Carmody, Michael Scharf, who is the Dean of Case Law School and Erika Chamberlain, they are not here right now. She is the Dean of the University of Western Ontario's law faculty.

I also want to give special thanks to those who worked hard to make sure this conference was put on and run smoothly: Aylin Drabousky in the back over there; Brian Glaviano -- Brian Glaviano, if you see him, he is the one with the camera. Of course, my partner in all of this, Ted Parran. Ted.

(Applause.)

MR. PETRAS: Finally, I also -- before we start the program, want to give special thanks to our sponsors who financially support this institute. Without them, we can't do the things that we do, and I want to give special thanks to our platinum sponsor, one of our deep supporters over the years DLA Piper, Rick Newcomb and Jim Blanchard of DLA Piper.

(Applause.)

MR. PETRAS: Our gold sponsor this year is the Government of Canada through its Consul office in Detroit, and we are here with Joe Comartin. So Joe, thank you very much.

(Applause.)

MR. PETRAS: Silver sponsors are the law firm of Steptoe & Johnson, Herman and Associates, Cleveland Cliffs, James Graham here, and the law firm of Baker Hostetler.

And finally, our bronze sponsors: Taft, Stettinius and Hollister and Bruce Lowe; Formica Corporation, thank you very much and Barudan America. So let's thank our sponsors.

(Applause.)

MR. PETRAS: At this time, unfortunately, Senator Sherrod Brown wanted to be here, but he couldn't be here, but he wanted us to present his greetings. So at this time, we have a short presentation from Senator Sherrod Brown.

(The following is a video presentation by Ohio Senator Sherrod Brown:)

SENATOR SHERROD BROWN: I am Sherrod Brown. It is a privilege to serve as Ohio's United States Senator. Thank you to Jim Peterson, Jim Blanchard, long-time friends and everyone at the Canada-United States Law Institute for your work on this 43rd annual conference.

Case is one of our city's great institutions. Conferences like this brings scholars and leaders and policymakers from around the country and around the world to our great city. The topic you are tackling at this year's conference is so important, climate change. Climate change, as we all know, is one of the defining moral issues of our time.

We have to take aggressive action now, means accelerating our transition to carbon free power, means investments in technologies to make our manufacturers more energy efficient. It means creating jobs and clean energy everywhere.

I have always refused to accept the idea that we have to choose between good environmental policy and good paying jobs. We put Americans to work, we change course before it is too late. Climate change is not a future problem; it is doing real damage in this country right now.

It is past time to rejoin the Paris Agreement, to restart the clean power plant, implement aggressive fuel economy standards for cars and trucks. It is not just a problem on the Coast. It is threatening thousands of workers in Ohio who rely on Lake Erie for their livelihood.

Tourism boat captains, other industries that rely on clean water, that's why your work is so important. While the President and far too many members of Congress deny the problem, they play political games, they spread lies to leaders like you in both countries who are working to confront this threat.

Thank you so much.

(Applause.)

KEYNOTE SPEAKER – THE IMPACT OF CLIMATE CHANGE ON CANADIAN-U.S. DEFENSE

The Honorable John McKay

MR. PETRAS: And now it is time for our luncheon keynote presentation, which is going to take another and different look at the impact of climate change, that from the perspective of national security and national defense.

And to introduce our afternoon keynote luncheon speaker is our own executive committee member, former Secretary of Defense for Canada, former Attorney General for Canada, Peter MacKay.

(Applause.)

MR. MacKAY: Thank you very much, Stephen. I want to thank the Institute and everyone for being here for this important discussion. I have the real pleasure to introduce John McChi or McKay, depending on how you like to pronounce it.

John, I used to get his mail as often as I got mine when we served in parliament. Actually, he has been a lawyer and a lawmaker for over 21 years in the parliament of Canada, elected six times, perhaps soon to be seven. John has served on numerous parliamentarian committees, but more than that, what I know of John is that he is tremendously committed to public policy making, to his community of Scarborough and Guildwood, Ontario. He has been an active parliamentarian, somebody who very much took part in some of the difficult and contentious debates that should happen in our legislatures.

And he has been a leading voice on very important issues around public policy. He is also in my estimation underestimated in terms of the contributions that he made to private members bills, which I can tell you are very rare birds.

It is difficult for an opposition party member, let alone even a member of the government, who doesn't sit in the cabinet to bring out legislation in the parliament of Canada. John has done something that I don't think any of the parliamentarians have accomplished in over 150 years.

He was able to move to legislation two bills, one while in opposition and another while a member of the government, one involving an important public policy matter that was little known, and that was flammable cigarettes. And there are hundreds of people who have died as a result of cigarettes that would ignite. And John brought in legislation to curtail that. He also worked in many compassionate areas, areas around social responsibility that Larry and others have referred to, social responsibility that brought about greater corporate action and accountability. And most recently, he has been working on a bill that touches very near and dear to my heart -- my wife is a human rights activist -- and it has to do with modern slavery, one of the real scourges that undermines our society, the modern slavery that goes on in our countries but around the world, is truly an area that requires much greater attention, much greater legislation, and much greater focus.

And while John and I were on opposite sides of the aisle, we crossed paths many times throughout our political career and even crossed swords on occasion, in parliament and in committee.

That there can never be any doubt is that John McKay's commitment and perseverance is for the betterment of his community, his country, and the world. He has traveled extensively on parliamentary committees to places like Africa and impoverished regions with a mind to try to help and to move in a positive direction.

And so I am very pleased and we should all be very thankful to be here to present on important issues around national security and defense that are very much impacted by the effects of climate change, and we will need people like John to continue to lead this effort in government.

So ladies and gentlemen, please welcome John McKay.

(Applause.)

MR. JOHN McKAY: Thank you, Peter, those are the nicest words you have said about me in year.

(Laughter.)

MR. JOHN McKAY: Peter's and my appreciation for each other sort of dipped when he was the minister of defense, and I was the liberal party's critic for defense. But we have since regained ground I have to say.

Peter, I was heartily pleased when you retired in 2015 because now I, too, don't have to send your mail back to you, and I am so sick of saying I am not Peter MacKay. I am not asked at any more, so thank you.

And it is good to see that everybody has got a life after politics. I see my friend Joe over here. It is just delightful to see him. Joe is one of the most thoughtful guys that the House of Commons has ever had in the history of the House of Commons.

And I saw John Godfrey here -- oh, there he is, he is still here. John was our intellectual bread bank, and whenever you wanted to talk about climate change, you talked to change, and Martha -- is Martha here as well?

There is Martha, and my good friend Jim, so all of whom seem to be extraordinarily well, and for those of us who are facing an election and maybe having that issue face us, it is encouraging and a comfort to see all of you here.

Now, it is a little intimidating to speak after experts. I will not make any profession that I am in any way, shape, or form an expert on climate change; did want to -- and this is the commercial announcement from the government of Canada having just tabled a budget -- you know how people say I am really pleased to be here. Thank you for the invitation, and they always say that in the beginning. You have no idea how pleased I am to be here.

We just came through a 36-hour voting marathon, and I had to say with my whip "I have to be in Cleveland on Friday. So that means I have to get out from this voting marathon, and because you are such a prestigious organization, he felt he had to release me.

But the national defense in the 2020 budget is committing $225 million to infrastructure projects, which is something I want to talk about over the next few minutes, to reduce the department's carbon footprint and greenhouse gas emissions by 40 percent from 2005 levels -- 2005 levels by 2030.

But before I talk about why I am here, I wanted to talk about the permanent joint board of defense, and I am told that there was a -- okay. And I am told that clicker here -- oh, that's your clicker. This is my clicker. Oh yeah. -- we have a clicker. Clicker doesn't work. Does anybody –

DEAN SHCHARF: Press the big green button.

MR. JOHN McKAY: I am pressing the big green button. Ah, there we are, all right.

So the permanent joint board of defense of which I have the honor to co-chair was formulated -- formed in 1940 by Prime Minister McKenzie King and President Roosevelt, and you will see that the third person in that picture, barely recognizable picture in that picture is, of course, Winston Churchill looking at the conversation between the two best friends.

McKenzie King and President Roosevelt, both of whom were Harvard men, both of whom vacationed together, both of whom had a really strong relationship with each other; not quite comparable to the current relationship I might say.

(Laughter.)

MR. JOHN McKAY: And McKenzie King had the realization that regardless of the outcome of World War II, Canada's security interest would necessarily transitioning from being part of the British empire to being part of the continental defense of North America. Both came from political aristocracy.

It goes without saying that President Roosevelt was political aristocracy. McKenzie King was the grandson of William Lyon McKenzie King, who in 1837 led a rebellion against the British and briefly declared Canada as a Republic.

For his troubles, he had to leave Canada until the British got -- until the British calmed down for his omnipotence. No less, McKenzie King felt that as Canada transitioned, we would have to have a joint way of managing the defense of North America.

Winston Churchill as you can see was none too happy with the prospect. President Roosevelt at that time was very concerned about the undefended West Coast of Canada, so if you can imagine from the Alaskan panhandle down to the U.S. border, was a largely undefended space, and he felt that something had to be done about that.

And so in some respects, this was the genesis for the permanent joint board of defense, which meets on an annual and sometimes more frequent basis than every year and has met since 1940.

To give the importance that it deserved to this consultative body, the direct lines of report were from the Canadian co-chair directly to the prime minister, not through the minister of defense, not through anybody else but directly to the prime minister and the America co-chair directly to the president of the United States.

Now, my current co-chair is General Chris Miller. And it is the senior advisory body on continental defense that you've never heard of. All modern militaries include climate change in their planning.

So after we go through the various international issues facing both of our militaries and after we go through our hemispheric discussions, also all facing our

militaries, the reason that this body is so effective is that at the end it draws up a to-do list, an accountable to-do list.

But it probably accounts for 80 years of success. One of the most significant changes -- and of course, there are literally more changes than you can imagine facing Canada, and the United States in military planning is planning in the Arctic. And I think this is a map that possibly we don't look at enough.

Canada has had the great security fortune of having ocean -- having the Atlantic Ocean on one side, the Pacific Ocean on the other and this great mass of ice to the north. And it has served us well as a, if you will, security blanket.

However, with climate change and advances in technology, there has been major developments in the Arctic, and as you know from-- as you know, the climate change in the north is particularly exaggerated.

If you will, the north puts the change in climate change because there is so much happening by virtue of the melting that is going on with the polar ice cap, and what were literally frozen border conflicts are no longer frozen.

And so just to name three, Hans island, which you can barely find on the line between Canada and Denmark, sort of around Alert, there is a one kilometer square island literally in the middle of nowhere to which both Canada and Denmark claim jurisdiction. It is not likely that we are going to be going to war with Denmark over that. Nevertheless, it does give you a notion of why these things are difficult.

The Alaska Canada border, now Canada, wants to draw a straight line, straight up, straight north. United States wants to draw another line, which is equidistant from either shore, and I looked for a map, so I could give a better explanation, but the conflict in the Arctic, potential conflict in the Arctic is 21,000 square kilometers.

That's a lot of conflict and a lot of resources are in those 21,000 square kilometers, and it will be a test between our two nations as to how we handle that conflict. You will see the northwest passage there.

Now, Canada claims that as an inland waterway and if it is an inland waterway, we have environmental jurisdiction; we have fisheries jurisdiction; we have control over the passage and various other issues.

The United States and pretty well everyone else regards it as an international waterway. Now, we could probably make some accommodations with our American colleagues transiting that waterway. I am not quite so sure that we can make so many accommodations with Russian ships and Chinese ships that transit it that waterway. So this may well be a security flashpoint coming forward.

Now, to meet these ongoing security challenges, we are having to change our infrastructure programs and the elements and the military that we need to secure in order to protect our sovereignty. Okay.

This is like a regular -- there we are. That's what we are buying. Okay.

(Laughter.)

MR. JOHN McKAY: Okay. Well, that's not quite what we are buying. That's actually what we are buying. And Peter will, of course, be familiar with the Arctic offshore patrol vessels, which can navigate in light sea ice, and there is six underway in Peter's hometown right now, Halifax. I have been to Irving shipyards.

It is quite a dramatic facility and quite an amazing way in which they put these ships together.

The first one is out the door and in water and being retrofitted, and I am told that in June it will be turned over to the Royal Canadian Navy. And there is five -- four, possibly five more to follow.

So that is one of the ways in which the Canadian military has responded to climate change, but of course, building in the Arctic has unique challenges because, as I said, the Arctic puts the change into climate change.

So you can imagine building a building in the Arctic. Bear in mind Canadian military works on a 40-year timeline. So they have to project forward 40 years as to the stability of the land mass. What is going to be happening with this land mass? So if you are putting up a fuel depot, you want to make sure that it is on a stable footing.

If you are putting up a runway, you want to make sure that it is on a stable footing. If you are siting a wharf, you want to make sure that it is not going to be inundated by unanticipated water, and you are also wanting to be sure that it is not stranded.

So these are the difficulties that are facing the Canadian military and challenges which some are really, really quite extraordinary.

In addition to the Arctic offshore icebreakers, we need to -- I'm sorry, Arctic offshore patrol vessels -- we need to up our game with icebreakers. This is, I believe, our only icebreaker still in operation. We need at least three more. The procurement contract has not been let. The Russians by contrast have eleven.

Now, you've heard about the Russian militarization of the Arctic. I am grateful to Senator Sullivan for this graphic because it shows it in a way that few of us actually can appreciate.

We live -- not only do we live south of 70, we live south of 60, and some of us even here we are below 49.

So we don't actually appreciate that. The Russians are really citing a number of bases and planes and missiles. The missile challenge is becoming more and more difficult because of the aggressive way in which the Russians are developing their missiles.

You can now start your missile further back below the horizon, have it run faster and lower and be upon your target much more quickly than you have in the past. It used to be you had to send your missile up and then have it come down. Now you don't have to send it nearly as far up, and you are sending it a lot faster. That, in turn, puts your defenses on the other side in some difficulty because you have to be able to react to those missiles coming in.

Now, I am not talking about imminent threat, shall we say, but the military has to -- the Canada-US military have to plan for the worst, you know, plan for the worst and hope for the best.

As you can see, there is a cluster of base rates there at the Bering Straits between Alaska and the U.S.S.R., and then there is another cluster just off Norway and Sweden, and a lot of these are new.

And it does bring -- and it is entirely due to the fact that what was previously frozen is now a reality and can be navigated, and with the advances in technology, the borders, if you will, just became a lot closer.

These are, if you will, public source open source documents of Canada's presence in the military. Peter will be relieved that I am not going to talk about the jets. That's a Canadian joke by the way.

But one of the biggest challenges is replacing the early warning system. It is extremely complex to have an all domain warning system. As I say, you can imagine from the previous slide just exactly where those missiles and airplanes may be coming. These are not idle conversations.

The Russian military has, for whatever purposes best known to it, increased their encouragings into North American aerospace. We are having to scramble our jets much more frequently. We are having to react to these encouragings each and every time, and it makes for a very active north. The early warning system you see there has to be replaced, and to replace that, you have to take into consideration the issue of climate change. Before you could count on that ground being frozen. How can you now site a station where the ground may not stay frozen?

Example: The dew line, which was the previous action to this early warning system, was dismantled, and in large measure what couldn't be taken away was barrier. It was thought to be buried and frozen.

Now it is no longer buried and frozen, and we have a significant environmental issue on the northern reaches of Canada to deal with it. So these are just part of the issues that are facing the Canadian military.

I have a real privilege of chairing this organization, co-chairing this organization, and I would say to this room -- and I am sure Peter would agree with me -- you can take great comfort in the relationship on a personal level, happened on a military to military level between our two countries. Ignore the rhetoric. Please ignore the rhetoric because the level of cooperation and dialogue is actually quite significant.

And because it is quite significant, our levels of security are well handled by the men and women both in uniform and out of uniform who represent it.

PJBD has recently grown to include diplomatic representatives and also people from homeland security and from public safety. And the reason for that is security and military are fast moving together. I will give you a little illustration.

My committee had before it Professor Clement from the University of Toronto last week. The subject that we are studying as a committee is the way in which financial services, in particular, but business in general are vulnerable to cyber security intrusions.

Professor Clement put up before us a slide of the cables that join Asia and North America, Europe and North America, and his point was simple: If you want to disrupt the cable traffic, the very infrastructure on which we depend, just attach a something or other to those cables. It is profoundly simple to do.

I related that immediately to an experience I had this summer. This summer I had the good fortune to travel on one of our frigates to Nacaluette down through Frobiture Bay and over to Greenland, New Greenland, and there we were met by the Danish general who is in charge of the NATO for that particular region.

And he talked about the various security risks, and I won't go into all of them, but one that really stuck in my mind was the fact that Russian ships seem to have an immense fascination of doing scientific research right over the top of the cables that join North America and Europe.

I don't know whether you can conclude anything from that, or I don't conclude anything from that, but here at one level the Danish general is giving his analysis of security risks that affect that particular part of the world, and a few months later, there is a University of Toronto professor telling us about how simple it would be to affect security and invade our infrastructure.

And if we think this is just an academic issue, take a look at your cellphone and ask yourself if I am sending an e-mail to somebody, where is that message going? Where does it go? Well, I don't know where it goes from Cleveland, but when you are in Toronto, it sometimes goes off to Chicago, bounces over to Boston, and back into Toronto. Sometimes it goes up to Montreal, goes down to North Carolina and then comes into Toronto.

We are quite vulnerable. Now, that is not a climate change risk, but it does illustrate the way in which those who would do us harm can easily do us harm and disrupt just normal ordinary lives.

So as I say, military issues and security issues are, I think, are becoming much more fused, and that is not only a result of changes in climate. But it is also a change in technologies that are moving at a pace that some of us -- I am having trouble keeping up. Of course, nobody in the room has had that same experience.

So with that, I am going to conclude, but I would reiterate, once again, you folks in the United States are well served by your people in the military. People I have met in the military in the United States are first rate, and I would say that as well with our Canadian military, they are first rate and are making the adjustments and responses as best they can, but as you well know, climate change is moving with tremendous pace, and technology is also moving with tremendous pace. And the interception of those two make it extraordinarily difficult to keep up with all of the security challenges that each of them have.

So thank you.

(Applause.)

MR. PETRAS: We have a chance for some questions.

MR. JOHN McKAY: You may have a chance for questions. I don't know if I will have any answers. Okay.

(Laughter.)

MR. GORDON: I notice you said there was one Canadian icebreaker and eleven Russian.

MR. JOHN McKAY: Yeah.

MR. GELFAND: How many U.S. icebreakers are on there? And by the way, I just love the way those maps look. It is an angle we rarely see.

MR. JOHN McKAY: I think it is an angle you are going to be seeing a lot more of.

And the short answer is I don't know.

I was on a U.S. Coast Guard exercise in Miami. Oh, man, they just ordered 56 of these things. Former minister of defense would drool to have those ships. So the short answer is I don't know, but whatever it is, there is not enough. I'm sorry.

MS. KOWALSKI: Thank you for your comments about some real security challenges that the U.S. and Canada are facing that relate to climate change. You mentioned the need for more icebreakers.

What other sorts of solutions do you want to see to try to address the problem and deal with the problem? Is it an issue focused more on climate mitigation or reducing emissions and things like that? Are there certain adaptation measures? What's the fix for it?

MR. JOHN McKAY: All of the above.

But I think one of the immediate needs is mapping. We actually don't know much about what's under the Arctic ocean, and that makes transit extremely hazardous, and there have been some recent examples where ships have run aground.

And as you can see, even if your ship is based in Nacaluette or New Greenland or whatever and you have an incident somewhere along the northwest passage, it is a long time to get there.

The trip I was on this summer, in addition to a few of us who are parliamentarians and some business people; actually were some Canadian Army along with Rangers. There are 1,800 Rangers, and these are local indigenous people especially commissioned by the military to provide a watching of what's going on.

There was -- the training exercise had to be canceled. This is in August, it had to be canceled because of conditions which our ships could not sail. So that's a significant adjustment for getting to do something that may well be an emergency. You just simply can't get there.

Yes, sir.

MR. MARFISHER: John, Mark Fisher, Council for Great Lakes Region. Thanks for the presentation. I guess the question I have for you is the U.S. military strategically over the years has done a number of different reports about the climate change and the threat globally but also to continental United States. I haven't seen the Canadian Armed Forces, at least in a public way, speak to it as -- in an open end way as I think the U.S. military has.

Is there some consideration about how to bring about being more clear and open about that particular risk and threat to the Canadian geography, first question.

And second question is, you know, for permanent joint board and defense perspective has there been any discussion about doing a strategic assessment in terms of the climate change for continental defense, right, and really understanding what the trend looks like and how do we collectively respond?

This morning we heard -- I think it might have been -- I don't remember who it was -- who indicated that the sea level rise for the U.S. Navy alone is going to be in serious position for ports and infrastructure, and has there been any discussion about doing a continental assessment about climate change, and how do we collectively prepare and respond to that risk?

MR. JOHN McKAY: Let me say that the capitalized military has not been as vocal as I think they should have been. They did release the policy papers in response, they are engaged. There was quite an extensive -- an extensive paragraph and discussion about the impacts of climate change on military preparedness. On the page ABD, it drives us crazy. You know, it is difficult to imagine what this is going to be. With respect to the replacement to the early warning system, we are not even sure we can land site it any more. I mean, if you are going to be in all domain, that means you are going to be under the water; you are going to be on the water; you are going to be on the land. You know, in the air, you are going to be up in space, and you might as well layer in cyber space. That's pretty significant and a major challenge.

In addition, NORAD wants to site one of its main bases somewhere further north. There are six sites under consideration, three of which are in Canada. The Americans, in particular, want to refurbish, tool up in the north end of Greenland, and that may be an option. That's not our -- by that, I mean Canadians' preferred option, but that's one of the things that is on the table.

Sorry. I always have to give the former impasse door --

AUDIENCE MEMBER: I just wanted to remark, I am not sure how that changed since the Soviet Union went out of business, but in the olden days, all of the Soviet Navy's capital ships had icebreaker problems, so their ability for the icebreaking table will shift, will be seriously greater than eleven.

MR. JOHN McKAY: Excellent point, and I don't know whether people have considered. That may well have. I just don't know.

GOVERNOR BLANCHARD: I am assuming that your counterparts in our country here -- and I am confident you are correct when you say the working relationship is outstanding and trusting and has been forever, at least since 1940 -- but I am assuming they kind of ignore the cosying up of my president or I should say the President of the United States to Mr. Putin, this love affair with Mr. Putin, his willingness to paraphrase Soviet propaganda.

I am assuming our military people kind of let that roll off and continue our vigilance and our cooperation. Is that correct?

MR. JOHN McKAY: I did put in in the previous iteration of the speech some comments about fake news and fake signs, and that it is all a conspiracy theory, but power is greater than mind where bigger paychecks persuaded me that I would create a diplomatic incident if I made any commentary along those lines as well.

I think the core point, though, is very simple. Military to military cooperation, Homeland Security, the public safety cooperation, minister to minister is really quite good and certainly with Madison and Sadjen (*sic*), there is a really fine working relationship there.

So I think people need to take some comfort in that. It does make for some awkward moments, and certainly over a beer or something a little bit stronger, there is some commentary that might even happen. But by and large, ignore that, get on with the business, and for the years I have been involved with it -- and I am sure again Peter could reiterate that -- it has been a solid working relationship.

MR. PETRAS: Thank you very much.

(Applause.)

MR. PETRAS: Okay. So we are going to take a quick five-minute break, five minutes only, and we are going to come back with climate change and economy.

Thank you.

(Recess had.)

PANEL DISCUSSION –

CLIMATE CHANGE AND ECONOMY: IMPACTS, RISKS, AND STRATEGIC THINKING FOR THE FUTURE

Moderator: Richard Cunningham

Speaker: David Terry

Speaker: Grant Goodrich

Speaker: Karlis Vasarais

MR. PETRAS: All right. Ladies and gentlemen, if everyone can take their seats, we are about to start on this next panel. One thing that I would like to ask everybody to do now is to take out your calendar and mark April 16 and 17, 2020, as the date of the next Canada-United States Law Institute Annual Conference, April 16 and 17, 2020.

More information to follow. Thank you.

Now, we are going to have our panel on climate change and economy, impacts, risks and strategic thinking for the future. To chair this panel is a member of our executive committee, Richard O. Cunningham, international trade partner at Steptoe & Johnson.

Dick has been a longtime supporter and member of our executive committee. He is one of the leading international trade lawyers in our country. He is always traveling off to places like China and South Korea and Japan. He just spoke yesterday on Brexit and China trade issues, and he is here today to lead this panel.

Dick?

MR. CUNNINGHAM: Okay. Thanks, Steve.

The British television show "Monty Python's Flying Circus" always used to begin with John Cleese sitting at a table like this with a microphone like this, and he would say "and now for something completely different." And this will be different.

We have talked about climate change and what it is. We've talked about the broad binational-national policies of climate change. Lots of things have been going on with climate change taking place at the state level, at regional levels, and among the corporations of Canada and the United States that have to deal with these issues, and we have a panel to address this major issue from those standpoints.

I am going to introduce -- and by the way, we have a particular unique -- you only get this from CUSLI aspect of this panel, which I will tell you about -- we have three panelists who couldn't be better for this purpose.

David Terry has 25 years of experience with wind, solar, and other energy issues. He is Executive Director of the National Association of State Energy Officials. He participates in energy policy discussions at the highest levels of Congress, at the White House, and internationally.

Grant Goodrich, hometown boy makes good, is Director of the Great Lakes Energy Institute here at Case Western. Previously, he managed the international research project and the Earth Institute at Columbia University, and earlier in his life he was Olmsted Scholar and studied international relations at Slovenia. I mention that last for a particular reason, which I will explain in a moment.

And finally, Karlis Vasarais will present some perspectives from the private sector. He is a low carbon energy entrepreneur with particular focus on emerging process efficiency technologies, on the innovation of fuels and on specialty chemicals produced from waste.

He is of Latvian descent and serves as vice chair of the Latvian credit union, and therefore, I can confidently say this is the only climate change panel that will give you perspectives of both Slovenia and Latvia. So let me turn the panel over to David.

MR. TERRY: Thanks, everybody, thanks Dick.

As Dick mentioned, I am Executive Director of the National Association of State Energy Officials, and just to give you a moment of a lens of sort of where I am coming from or how I view things, our members are the 50 governors, energy directors around the country. We represent all of them as well as the territories.

They have an economic lens as much as an energy lens. These are not regulators. These are folks that are developing policies. The typical governor after life, health, and safety is worried about jobs in the economy in an energy context. So I guess I would say, in short, our members have been at this confluence of climate energy, technology, and the economy for the last 30 or so years.

We have been heading that direction. I think we are finally there in earnest, and I guess the other sort of preface to my remarks is that there are some people that are glass half empty, some are glass half full. Fair warning, I tend to be glass overflowing, so it is an upbeat message for the states.

There were really three areas that I wanted to hit on, and a little bit is the context of climate environment and energy technologies and where we have been. For a very long time, many of the states didn't say the word "climate." There were political connotations to it that were challenging. At the same time, they were moving energy policy ahead in many places in pretty fascinating ways from an economic development perspective and also from a climate perspective, even though we really didn't think of it that way. I want to talk a little bit about that.

Secondly, some of the things that we see on the horizon right now, just the change that has occurred in the last six to twelve months, both politically and economically, in some of the states I think are worth touching on.

And then, lastly, a little bit about what we see coming down the pike in the relatively near term that I think is worthy in terms of climate, clean technology policy, economic development, and some of the costs associated with it.

I guess at the outset, when I think about cleantech and climate and innovation, in the late '80s, early '90s, our organization started one of the first combined government -- state government-federal government private sector cleantech investment programs that had never been around. It was early risk capital and venture capital before venture capital really called cleantech "cleantech".

It didn't go very well. It was not very successful, quite frankly. We learned a lot from it. We did it differently ten years later, but we invested in things like trying to make wind power cheaper through various technological investments, trying to improve various materials involved in efficiency, manufacturing, and so forth, a whole variety of things, and some good things came out of it but from a commercial perspective not so much.

About ten years later in the mid '90s, we started a joint cooperative research development demonstration investment program among states, the private sector and the federal government, and it was focused on particular cleantech areas. Again, we didn't call it "cleantech," but it involved very high end building efficiency technologies, transportation chemicals, et cetera.

A few of the things that came out of that are interesting, the country's first plug-in electric hybrid school bus came through a joint investment between the state of Ohio's Energy Office, North Carolina, Washington State, Oregon, New York State and the Department of Energy and a couple of private sector companies, and that model is still on the road today.

So that was sort of the round -- really weren't aligning policy very well, but we were trying to align research and demonstration dollars, and I think we had some good success. So there is this past kind of collaborative activity that I am going to return to at the end of my remarks that I think are relevant for some of the challenges we have today.

The other piece that was happening at the same time were policy actions by the states. We haven't had a federal climate policy as everybody knows in any serious way. About 15 years ago at a Nazio (*sic*) meeting, I made a very flippant remark. It wasn't intended to be. It got a little bit of a laugh, and it got me in a little bit of trouble.

But I will say it again for context, the Congress, U.S. Congress would probably act on climate in a serious way when we had a polar bear and an ice cube in the Potomac River. And it was meant for effect, and it really wasn't meant to be disrespectful, but we tend to act at a crisis level at the federal level even as states move forward.

And we think often of the Californians, the New Yorks, et cetera, that are maybe taking progressive actions in this area for quite a number of years, but there are other states as well, and I think they are instructive about how we move forward.

If you look at Iowa, Governor Bransted, who left a couple years ago to be Ambassador of China, longest serving governor in the country, he started in the late '80s with the first renewable electricity standards in the country, it was voluntary, but it was the first one.

You fast forward -- he was a great energy governor -- Iowa has no discernible coal, natural gas, or oil. He knew that. He understood the economic implications

of it. He also understood the environmental attributes of some of the technologies and resources they had in the energy space. That led to the policies that supported ethanol development.

Iowa produced 40 percent of its electricity last year from wind. And now, they are moving forward with solar with Governor Reynolds' leadership; places that you don't expect.

We see the same thing in Texas with wind and storage and a variety of other areas, and I point those out only because those haven't been done under a climate umbrella, but they have been critically important to moving those states forward, and when we look at where things are -- okay. The rate, I will try to speak up.

The other points I would make are more recent. We see a number of states now moving in new areas of grid optimization, the activities. North Carolina, for example, is looking at their grid in earnest. The new governor has called for a climate plan, which the energy director is undertaking there. Massachusetts is moving full bore on offshore wind as is nearly every state from Virginia north to Maine. This is a tremendous resource.

The early leaders in Rhode Island, Massachusetts, some of the other states are bringing the costs down rapidly. So the opportunities that we see, they are all happening at the state level in technology, are economically driven. I think the climate crisis and the cost associated with it, our ability to solve those are not only dependent upon international relationships and coordination, for example, between Canada and the U.S. but on our ability to turn ourselves, our companies, our states into technology leaders.

So this technology policy is virtually a circle that we see at the state level. We think it is critically important to support. The other thing that I wanted to focus on a little bit is looking forward. The election last November left us with 22 new governors, a number of returning governors.

When we did our list of where energy policy and the governor commitments that were made during the campaigns are, 26 of the governors have some combination of hundred percent renewable goals, 80 percent renewable goals, large climate goals, zero emission vehicle goals in their campaigns that they ran. They are headed in that direction.

Whether the state will or not, we shall see, but that's more than half the states. It is not the geography around the country; it is much broader. That change last year, which I think changed politically also in Congress, irrespective of the change in leadership of the house to the Democrats, there was a change in the air.

I think there is finally that movement at the national level that I referenced earlier about the polar bear, I think we are seeing that shift, and it is that alignment between federal and state policy that has been missing, that we hope that we move toward, and I think we will see more of that.

What we are hearing from our members from private sector companies that we deal with are to better align research development demonstration, so we have states that are doing that now.

Florida, for example, they are coordinating their public research institutions, cleantech research on a regular basis, what are their strengths, weaknesses, where

they can derive private dollars, draw on federal dollars, et cetera. We see it in work force.

We just completed the third installment of the U.S. energy employment report at Nazio. This is something we do in combination with the energy features initiative. That's an organization operated by former Secretary of Energy Moniz. These are the first employment numbers in energy that are reasonably accurate in every sector.

If you look at the Bureau of Labor statistic numbers they are wildly off for every sector, not just the efficiency and renewables and things people think about in that category but in nuclear, in power plant operation. We don't understand the work force that we need. We are finally getting those numbers after decades, and that's having a big impact on work policies and work force development, having a big impact on companies that tell us the biggest impediment they have to advancing technology, to advancing in this area is work force.

So it is another decomponent, and I think the last item I want to touch on is just noting the coordination we have had from a state perspective with the government of Canada, with international companies, also with other exchanges we have done, with France, with China on efficiency programs, on renewable programs, joint R & D activities. We haven't seen that at the federal level.

We do see it at the state level, and I think it is very heartening, but on the major issues we have, whether it is something to address adaptation and ports as was just discussed, we have to have that collaborative nature.

We can't do this alone, but I think it is the cleantech activities we see at the state level supported by the combination of policy, some investment. Frankly, I think the private sector investment is probably adequate in that regard, but more the policy alignment and bringing that together at the state level, at the regional level and hopefully a little bit more coordination with the federal government in that regard I hope will push us over the finish line.

We are optimistic about that, and last two things I will leave you with are just some glimpses of federal policy for the reason that I am optimistic.

Last year we saw the passage of the Disaster Reform Recovery Act, something nobody really noticed, frankly, but it is a huge amount of resources every year that go to disaster recovery and rebuilding.

Until last year we had to rebuild, whether it was a structure or whatever it was, to the standard that it was originally built at. So fairly ridiculous idea. You take federal dollars, you have a house that isn't built well, and you rebuild it but not well again; doesn't make much sense, and that applied to infrastructure broadly ripped. So that has changed finally.

Congress voted that out bipartisan basis; president signed it; all is good. The other aspect to that was a predisaster mitigation fund. We used to not plug the holes in the bucket in energy infrastructure, physical infrastructure before a disaster, and we would pay more for it afterward. Now, roughly a billion dollars a year starting this October will go out to the states, to the emergency management agencies to undertake infrastructure projects of all kinds intended to be more

resilient, finally getting the message that maybe we should do some investment before things happen. It is a good sign.

Congress understood -- Republicans and Democrats understood what they were doing, and climate was a part of it. They didn't say it very much, but they knew it, and that's why they did it. So it is a bit of optimism.

We have also seen some changes to the flood insurance program along the same lines by the Trump Administration in the last six weeks. Again, I think it is a heartening sign to, at least, we're beginning to address some of the problems.

Thank you.

MR. CUNNINGHAM: Thank you, David.

I hope you are glad all of you stayed here this long to be cheered up a little bit now that we got this panel.

So let me turn now to Grant.

MR. GOODRICH: Thank you very much, Dick. Good afternoon, everyone, and thank you so much for taking some time to be with us today. I enjoyed our last speaker up here. One thing Dick didn't mention about my background. I am a Naval Academy graduate. My first summer cruise was a joint multinational exercise with the Canadian Navy off the coast of Washington State, so collaboration with our Canadian partners is something important, and I am glad to see that that is something in this room that would continue to develop and take forward.

I am Director of the Great Lakes Energy Institute here at Case Western Reserve. We are an energy research related institute that helps support our faculty in developing partnerships, find research funding, and make the research programs even more successful than they already are.

And I certainly -- as I talk a little bit about technology and maybe build up with some of David's remarks and focus on opportunities, technology, and emphasis in research and development is certainly one of the opportunities that I see.

I do want to rehash some training that some of you have already covered this morning and earlier today. In talking about the science, I always think it is important to make sure we are on the same page.

I would like to focus a little bit on the Great Lakes Region. That's certainly important to all of us here in Ohio and certainly important to our Canadian neighbors to the north.

So what does the science anticipate to be the climatic -- I'm sorry -- climatic changes affecting the Great Lakes Region for the next 20 to 30 years and again just very simply hitting the high notes? More ice free days on the lakes, and that certainly has economic impacts and opportunities for those who count on the lakes for moving goods and services; more rain for the region to include more intense storms, and I would like to spend a little bit of time talking about that.

We just mentioned flooding insurance, and that's certainly something I would like to spend time on. We have seen the losses this past week in Nebraska and Iowa, especially with the flooding and the impacts that we will see not just on livelihoods but on farming and what that means for agriculture and for food security and food supply.

I think for our nation one of the important things that we haven't spent a lot of time talking about is the impact on the jet stream and, more importantly, the disruption to the jet stream.

As we see that straight line that we knew growing up for so many years become kind of this wavy co-sign or sign signature that is leading to incredible unpredictability in our weather pattern, so unpredictable frost freezes, the occasional polar Vortex, this Pacific river as some people have called it that is pounding the West Coast this past year, nationally, we will continue to see a drying of the U.S. plains in the Southwest.

Water will increasingly become a scarce resource in parts of the country, and that may create economic opportunities for the Great Lakes Region as we talk about economic opportunities as part of this panel.

So it is the unpredictable nature of our weather patterns, which is certainly one of the challenges that we face, and certainly, it is one of the challenges that we will need to be reconciling with as part of what we might call the new norm.

I know a lot of what David just talked about are the investments that we are taking to try to mitigate against climate change right now. I hope we continue to take those actions and invest more, frankly, in those actions. But I do think it is important that we also start investing in adaptation, and that everyone understand that so much of the warming that we have already experienced is baked in, and by baked in meaning, you know, when you look at where the warmth has gone, it is in our oceans.

When we look at changes in temperature with that warmer ocean that we have today, it is going to take a long time to -- with any amount of mitigation -- to see a stop in the rise of CO2 parts per million in the atmosphere. So again, addressing adaptation to me is an important topic.

Moving on to some of the economic issues, again, the panel on economics, strategic thinking, risk, so we talked a little bit about flood insurance, and I do think about flooding as a new norm and something that we will be talking about much more regularly in this part of the country, is something that I hope we move into panel conversations and we start addressing with more regularity.

The question really becomes if your property floods three years out of every 20 instead of one out of every 100, what is the flood plain, and whose responsibility is it to address that? And who is addressing that?

And it leads to this really interesting intersection of responsibilities. At the local government level, it is your county engineer and often ignored in most places an elected position that most political parties have not paid attention to and are just starting to realize that that is the person who ultimately decides whether or not you are going to be able to build in a certain location or not.

At the federal level in this country, there is pressure from FEMA to say wait, wait, wait, you can't build here anymore. The designation for this stream or creek or river needs to be amended based on what we have seen for the last 10 or 20 years.

This raises some exciting questions for, especially for the legal community. If FEMA or your county engineer decides that the piece of land that you bought to build on a nice -- whether it is a development or a supermarket -- on is not buildable

because they are changing the flood plain, is that taking your property in some respect, or its impact on its economic value, and if we start to see whole scale changes to the floodplains, what does that mean for real estate or for other purposes?

Again, if your property floods three years out of every 20, if you are the property owner, do you want flood insurance, and if you are the insurance company, do you want to offer that insurance, and I think, again, I think these are very important questions that we all should be talking about much more frequently, and I expect if you are the property owner the answer is yes.

And if you are the insurance company, the answer is maybe or no but maybe at the right price. So these are important changes that are coming. The same thing can be said for agricultural or crop insurance. Again, if your farm is flooding three years out of every 20 instead of one out of every 50 are you as a crop insurance broker or crop insurance provider going to sell that insurance. And I think it is a greater question that we need to look at, and it certainly starts to speak to the vulnerability of our agricultural lands, both from flooding as we have seen this week in Nebraska as well as to drought and drying as we are seeing in the areas above the Ogallala aquifer, which, you know, depending on who you talk to, has got 20 to 50 years of water left, not enough for the youngest people in the room, and that's for sure. And if you look at the drought conditions on the West Coast, you know those are expected to continue.

Obviously, this year has been quite wet, but long-term trends suggest increased drying out there. Again, when we talk about economic opportunities for this region, obviously, Canada and Ontario in particular is known for the greenhouse growers in this region. That may even continue to become a greater opportunity for like produce for the Midwest and the East Coast and maybe a new opportunity for Ohio greenhouse and other greenhouses around the Great Lakes Region.

We have talked a little bit about offshore wind, especially the opportunities that we are seeing explode on the East Coast of the United States. Great Lakes based offshore wind may finally be harnessed and may lead to increased opportunities for Canada-U.S. cooperation on this front.

Certainly, this is something at the Great Lakes Energy Institute that we have been involved in from some of the research and development aspects of putting these structures into the lakes and what kind of structures would anchor the turbines to the sea floors.

On the R & D & T's, research, development, and technology front, I do think that continued investments by both our governments by the venture community that we will hear about here momentarily are important opportunities.

I do think that we are looking to the technology community, to our engineers to help develop solutions to some of these most pressing problems that we are facing.

And part of what's exciting is that some of the investments that we have already made are starting to reach the kind of maturity that we need to provide a runway going forward. One of the success stories that I think we have seen here in

Ohio, First Solar has moved a lot of their U.S. based manufacturing in Perrysburg, Ohio, over in the Toledo area.

They are a manufacturer of rigid thin film solar panels. There are over five gigawatts of solar panels this year ramping up to ten gigawatts within the next four to five years. Almost like some of the aircraft manufacturers, they have -- they are sold out for the next two years, so it is exciting to hear that the technology is that mature and that investors have that level of confidence that we are buying and installing at a very, very high level.

Again, for scale, Davis Besse or Perry Nuclear Power plants here in Ohio, each of those is about one gigawatt. So we are seeing one of those being installed annually just from First Solar alone.

The last thing I will mention is some more of these risks, and again, in the Great Lakes Region, you know, as we talk about warming water and some of that warming being baked in, obviously, we talked a little bit about toxic algal blooms in Lake Erie and how that impacts our water supply.

Again, there are other economic impacts of that. Obviously, Lake Erie is known for boating, for recreation, for fishing. It is a billion-dollar plus industry as we are reminded here in Ohio all the time, and if the water is filled with green goop, people are not fishing for walleye, they are not going to the parks and to the beaches in the summer on either side of the lake and, certainly, something that we should be concerned about.

I do think there are opportunities. I know we have friends from some of the Great Lakes organizations in the room. These are operations for greater cooperation between our countries that we should certainly invest in but looking forward to having a robust conversation about these or many other topics here this afternoon.

Thank you.

MR. CUNNINGHAM: Thank you. That was great.

Before turning to counsel, I want to make a personal comment here. When I told my wife I was coming to Cleveland to participate in the climate change program, she thought for a minute and said, "well, let's see, we have got a beach house on Barrier Island on the Jersey Shore, our two grandchildren in Portland, Oregon. We just bought a small condo, which is right on the edge of the river in northern Oregon. Thank God our home is on a high hill just outside of Washington, D.C. because it may be the only thing we have left," so pay close attention to the comments.

So let me turn to you fellows and what's going on with business, particularly with the entrepreneurial side of this whole equation.

MR. VASARAIS: Thank you, Dick.

My name is Karlis Vasarais. I am a carbon entrepreneur from Canada. I have Latvian roots, so that that plays in how I feel about an oppressed former group from the Soviet Union, but what I do in my day to day is create and breed clean technologies.

Between me and my business partner, we have raised over a quarter billion dollars for six different ventures. They are Canadian dollars so the northern American peso. But we have brought four of them to commercial revenues. We

have sold two of them. We bought them back, and I am apparently CEO of one of them, and he is CEO of the other.

And climate change is near and dear to both of us. My business partner did serve in the Army, in the Armed Forces. In his mid 20s, he was diagnosed with leukemia, and while he was recovering, he came to the idea that he wasn't in the business of defending someone else's oil. He wanted to make his own, and that's his lifelong learning, and he has been my mentor and started off as my CEO and became my chairman, and now we are business partners.

Climate change, I hate the term. I think it is a suitcase term. It has got too many meanings, depending on who you are talking to, and it plays to conscience, it plays on your emotions, and plays on morality, plays on thinking, and unfortunately, it also plays to political discourse and the ties of change in the political environment.

If someone asked me do I believe in climate change? I refuse to answer the question because it legitimizes the climate changes for the question. If someone asks me, do you believe in climate change? I ask, do you believe in protecting water that you drink? Do you believe that you and your kids and your grandkids should breathe smog?

On a more economic level, I ask myself globally, do we have enough resources to feed the world? Do we have enough resources to bring the rest of the world to the living standards that we all want to see the world live in?

And at the end of the day, if someone is still really stubborn with me about that, it is all back to markets. I mean, the first presentation this morning you see temperature like this.

If that was a talk and every single analyst on Wall Street is saying buy, buy, buy because everybody is seeing that that stock is still going to go up by 1 to 4 Celsius over the next couple of years, you are going to buy that stock.

And frankly, if you want to finance that stock, Shell is selling its refinery business. The Norwegians are getting out of early stage exploration, and if you really want to go for it, there is a whole bunch of coal plants for sale across the U.S.

So that's how I kind of view climate change, so I don't see it really as risk any more. It is more about one of the hurdles of preventing us from overcoming the policy discourse and the businesses first that is preventing the advancements we are looking for.

The reality is oil and gas is the biggest industry the world has ever seen. It has captured regulation and regulatory bodies at every level of government around the world. So how do you deal with that? It is a big question.

Yesterday's question, are we waiting for events to happen? Well, we have seen it has happened, but they are not happening locally for the most part or at least not happening in a way that is really making us want to do anything differently.

You know, you look at the insurance industry now, places in the U.S. you can't get insurance for your home, for instance, Florida. You are seeing these massive floods over in the West with the bailouts at the federal level. We are going to allow these people to live. We still see a huge disaster in Puerto Rico from one of the greatest hurricanes ever to hit the island.

So these are events that are not helping. It is really not helping. So we have a lot of lawyers in this room, and what do you do in this sort of place when you look for cooperation? Well, you look for precedence, right?

I guess that's what you guys are supposed to be researching all the time is precedence in this sort of world. The reality is most of the precedence is in climate change, and precedence is in making good work. It happened by accident, or it happened by opportunistic industry.

For one, we look at the Montreal protocol, one of the greatest legislation that was written to protect the ozone layer. It was a very foreign concept. To many people, there is a hole in the air, and nobody really understood it and it failed a couple times. Why did it end up working?

Well, the head of HFC, nobody else in HFC, so they were more than happy to eventually phase out and ban CFCs because that gave them a competitive advantage over their local peers. The next one is the German feeding tariff, currently burdening the German economy with over a hundred billion dollars of additional costs to bring electrons to the grid. How did this happen at such a massive scale? Well, Germany had the same problem as the U.S. They were going to lose manufacturing to the Chinese.

If you look at manufacturing as a percentage of GDP, Germany has been at 20 percent since the early '90s. The U.S. was at 20 percent at that same sort of period. Germany is still at 20 percent manufacturing percentage at GDP, even though their cost and labor rate is higher than the U.S. Since then, the U.S. has dropped to 12 percent.

So the German government was more than happy to help recreate industry. They took advantage of the German Black Forest that was also acidifying. They took advantage of time in nuclear and nuclear uncertainty and meltdowns around the world to scare the population into action, but they also have a different form of government; that they get a level of proportional representation.

So once a green party -- I was able to join a coalition government, they pushed for more of these tariffs. The other reason it worked in Germany is that lobbyists, like they lobby differently in Germany. Here in the states, you can independently as a company hire lobbyists and go talk to a political figure. In Germany, the government will only talk to industry associations.

And so the industry associations for utilities is actually quite disorganized. They didn't have a counter plan to deal with this. Very different with German cars. We think the German cars are so progressive with regards to their environmental regulation. Not true. Look how far they are in electric vehicles because the German car industry is very organized, and they certainly protected themselves in this realm.

China again, they did exceptionally well in their solar development. Why is that? Well, we had a huge recession globally in 2008. They decided they are going to invest in R & D. Chinese have no idea how to do R & D for multiple reasons, mostly because they like to steal other people's R & D. But so at the local level, people still have economic targets, the local governors and economic targets. They took R & D, and they built factories, and they justified we need a full scale solar panel manufacturing facility, so we can figure out how to make them cheaper.

Well, it paid off to the local industries' incentives, but it did drive the cost of solar down tremendously as a result.

And the last one, which I will touch, is biofuels. Biofuels, of course, did have a lobby here, which was first corn to make ethanol. That is a different than mine, but when that first came out, it was -- you could comply or industry could pay a fine. That worked for corn because they had other markets for corn.

When biodiesel came around, they said that's not going to work for us because if oil and gas can pay to get out of compliance, they may not do it, and we don't have secured demand. So in Ontario a lobbyist by the name of Lynn Baker, a colleague of mine, he actually lobbied and eventually changed the Clean Air Act and made CO2 a pollutant under the Clean Air Act. That made it illegal not to comply with blending mandates.

Back to an earlier question: How do you get directors involved on a legislative basis? Very clear, a very good example of how you get that to happen. Biodiesel has since expanded, ethanol has expanded. They live under the umbrella of oil and gas, but they don't need to compete with oil and gas. It is still more expensive to create biofuel than it is traditional fuel because there is no price on pollution.

So if you can do that, all the players in the biodiesel, all the players in the renewable fuel business, it is not about outcompeting oil and gas; it is just outcompeting your peer.

There is a famous example of, you know, if there is a bear chasing you, you don't need to outrun the bear. You need to outrun the guy next to you. So but there is a policy evolution here.

I think for most policymakers, it is okay to make mistakes at the correct time. The original biofuels legislation were not great; they were not perfect. We continue to modify. The U.S. has introduced carbon, low carbon fuel standards. It is not just renewable fuel. It is how much carbon reduction your fuel delivers that is becoming more of market.

In the states, you have rings. That's different than Canada. You can only make your blending mandates by actually purchasing the fuels. In the states, you can buy the credit, not just the fuel; makes it easier to comply. It is a more efficient market. People are continuing to change how to make these policies work. It is not written in stone. These things have to be figured out over time. They have to modify it as we learn how the CL industry is reacting.

So, you know, what's the future of this? I am optimistic in this sort of thing. My girlfriend thinks I am a horrible private citizen, but I am a realist. If you look at where the world was a couple decades ago, horrible, was surrounded with famine.

The world was impoverished by several billion more people than they are today, and now a couple decades later, there are relatively good living standards around the world. Climate change and the topic of a transition to a low carbon economy is next on the list here because there is enough -- there is a critical mass in the world now that finally has the luxury to pay attention beyond food, clothing, and lodging for themselves.

I see the future a little differently in terms of how climate change happens, and it has to happen because of mitigation and adaptation all happening at the same

time. We also still have a major component of cyber security, going on at the global level, and we have tariffs at a very localized level, and that can be delivered in vessels that were not imaginable decades ago.

So I see the transition to a low carbon economy, this small scale. If you look at Shell, Shell just announced last week that they want to be the world's largest produced distributor of electricity. They see the world in decentralized local grids; makes for a huge challenge for an industry like nuclear, any sort of large power plant.

If you are not responsible for the grid around your asset and that grid is getting hit with freezing rain every year, with wind storms, with thunderstorms -- up in Muskoka or maybe parts of Michigan. When you get these wild thunderstorms all summer long and you are out of power, you look at the cottages on the lake, and there is still power to them.

They are going to test their battery and solar panels on their roofs. I also see the transitioning happening to these first. Climate change you have to see for it to work. People in cities, you are closer to the problem; you are closer to the solution. Cities also send out the type of population that wants to see it happen faster.

And capital, and this is the toughest part of the market, the capital chunks that go out to these projects are small scale. I can talk about any of the projects that we are involved in, and I say build five, then come to us, and prepare a portfolio of 40. Then we will give you a billion-dollar check, but I can't do anything under a half billion-dollars. And they are like, you know, the scale time and again, it is the world's largest industry. But those are the actors that we have to deal with, and those are real constraints in our environment. But there is a hole here. Nobody -- unfortunately, cleantech as a term has been soiled. There is too many losses -- there are too many early losses in the industry. We don't call it cleantech anymore; we just call it an energy efficient economy, a resource efficient economy.

We are going to be resource efficient with the sun; we are going to be resource efficient with the wind, and we are going to be resource efficient with all of our existing processes to make our industry more cost competitive in the whole context.

If you sell that story at the policy level, sell that story at the industry level, well, now, people are listening because it means more in the bottom of their pocket.

I also think -- and I hope without too much policy backfire here -- that what we are really trying to do -- and I don't see climate change as the biggest threat facing the world today; I see the disparity of wealth as the greatest threat the world faces today, and I do believe that if our hypothesis is true, that small scale is going to work, that small capital is going to work, and transition of the sea level is going to work. I believe that it can lead to the wealth redistribution, that this is now you need to try and survive again.

I believe that if we can find ways to release energy and processes at the local level, you can reinvigorate the investors. You can reinvigorate Thunder Bay, Ontario. You can reinvigorate the maritime in a way that you can't do if you keep thinking it has to be huge, it has to be made centralized, and we just need the rest of the world to buy our stock. We have to teach people how to fish.

And so a little bit about we only go after the hardest problems in the world. Half our carbon reduction is moving us around. We are looking at transportation fuels. If you look at the IA standards about 30 years from now, gasoline is supposed to drop by 25 percent consumption.

But distillate is the thing and diesel fuel, jet fuel, marine fuel, distillate, and I mentioned the chemicals derived from it. That's supposed to go up by 35 percent in terms of global demand. That's the market we focus on. It is a much harder market. We have proven pretty efficient to make good electrons, renewable electrons. We have not yet found a way to make good and renewable hydrocarbons. That's what we focus on.

So in conclusion, I believe that we have all the technologies that we need to achieve our 2030 targets under the Paris climate change. I think that that is a question of policy, not a question of technology to achieve our 2030 targets. If we want to achieve our 2050 targets, though, we have ten years of R & D to do and then ten years of deployment to do in testing and scaling before those technologies are going to be ready.

So we still have a dual problem. We need policy on line to get the short term goals, and we need business and R & D and government support at the basic science level in order to achieve our long-term goals.

Thank you.

MR. CUNNINGHAM: Wow, that was really interesting.

(Applause.)

MR. CUNNINGHAM: I am going to ask our panelists to comment on each other's presentation, but first, I want to take the prerogative of the chair and make an observation on this.

We talk about this in terms of mitigation and adaptation. And I think you need to talk about a third thing, which is compensation. And we heard, for example, earlier one of our panelists said that she got beaten to death working for a carbon tax, and it was called a job killing tax. We have heard another panelist earlier today say that, boy, you can't have -- I think it was a gas tax, maybe a carbon tax -- because it will hurt the people who have to travel substantially for jobs in the heartland of America and all that sort of stuff, whereas people in New York City walk across the street and don't travel for jobs.

And what that says to me is that you have here one -- the whole climate change thing has a policy issue and as a pragmatic issue is not conceptually different from the other elements of major rapid change that are happening to the economy and society today.

I deal in trade a lot with the people who are concerned about technology change, that technology is going to wipe out jobs, and people aren't going to have jobs.

One of my clients says the story about what's the factory of the future going to look like? It is going to have two employees, a man and a dog, and the man's job is to feed the dog, and the dog's job is to keep the man away from machines.

(Laughter.)

MR. CUNNINGHAM: And the difference between technology and climate change is that there is, I think, an assumption, almost universally shared technologies are just going to happen. It is not something you are going to stop.

Climate change is something that is there. It is not only debated as to whether it is going to happen, but it is something that we have to take action to stop. And the compensation flows from the action we take, not from -- the need for compensation for people who are losing jobs flows from the action we take, not from the change itself, from climate change or the technology change, for example.

And what it seems to me you have to think about and your comment on the Germans and how the German manufacturing employment has stayed at 20 percent, whereas the U.S. has gone down to 12 shows a country that has looked at it from that standpoint, which is that you have to deal with the change, but deal with it in a way that is holistic enough to affect both the prevention of the adverse -- that it complies with the mandate to change but also deals with the consequences on some group in society that is affected by how you deal with the change. And that's something we have trouble dealing with in point because we deny there is climate change and, in part, because it is hardly -- I think it is intrinsically harder in the climate we live to say government needs to spend more money to do compensation for the change.

So I think -- I find the discussion -- all through these discussions in one way or another sort of focused on that. And I find that very interesting. I am not sure that I have the degree of optimism, but we will address that, but it does clarify in my mind a little bit about how we need to address that. Now, let me ask each of you to sort of discuss a little bit of what the others said for a moment to the extent you want to do so, and then, let's have questions from the audience. So let me begin with you, David.

MR. TERRY: Sure.

I guess a couple of things. I think the compensation comment you made is right on. I think in my mind that presupposes it is likely a federal climate solution and again going back to my crisis comments, although you would think we would be there, I don't think we are quite there yet at the federal level to have some kind of compensation scheme. It is just where we are.

The other piece of that, though, is from a very narrow either individual state lens or very narrow U.S. lens. The technology and economic element of this is what, in part, pays for that. That doesn't make everybody a winner, and it is very narrow in its view but that is how you get from A to B politically I think with that.

MR. CUNNINGHAM: It helps significantly.

MR. TERRY: It helps significantly, exactly.

And I think the other piece, though -- and unfortunately, we have spent all the money as a country, so it is not as though there are many more checks that can be written, that's one piece, and the other part is -- and you see it reflected in legislation that is being passed either directly in this area or indirectly. I will give you an example.

The Obama Administration Republican house or Republican Senate passed a unanimous consent in both Houses reforms to the flood insurance program to make it market rate and to redraw the flood plan. It was in law and signed into law with

full Democratic and Republican support for six months before it was rescinded. And it was rescinded because everybody who was in the flood plain lost their minds when they realized their home and condominiums and businesses would have lost a great deal of their value. So that happened, and it was rescinded.

And I think it is an example, if we are not prepared for those shifts, the transition, the compensation, and you need the economic development to go with it, in part, and it probably means a reordering of priorities.

In that sense, I think it is one of the bigger challenges we have. It tends to be policy and economic. I think much was said earlier, it is not a technology problem in your term, but it is this policy crisis.

I think the state level we see some of that, and I will give one example and then wrap up. In Florida, they faced the prospect of no private insurance for wind insurance and hurricanes a decade ago, no private insurer except Lloyds of London will insure your house in Florida for wind insurance; no private insurance, of course, for flood insurance, either one.

So the state began ratcheting up the building codes and standards. Every time there is a hurricane category III, a team goes out from the universities, and they look at the building code, where did it fail, where did it work and they rachet up the standards again and call the insurance, the state-owned insurance company, and they make an assessment of what is done right and wrong.

You buy a house, the company or the company they hired goes out and looks at the house, see if you made the provisions, and your insurance is either very high, or it is some measure lower. That's where we are headed with this, but it is about the exception piece and readjusting where people live.

I do not think it is going to be -- there may be a lot of legal issues around it, but I think we are so rapidly by the economics of flooding that it may be a moot point.

MR. CUNNINGHAM: When there was an earthquake in San Francisco a number of years ago, many of you remember Dan Rather after the earthquake interviewing the mayor of San Francisco and pointing out to him there are still being buildings built in San Francisco without earthquake reinforcement, and the mayor looked at him and said "well, Dan, you have to understand that our people would rather live a lifetime of fear in San Francisco than a lifetime of heavenly bliss in Sacramento."

(Laughter.)

MR. CUNNINGHAM: So you next, Grant.

MR. GOODRICH: Dick, that's a tough comment to follow right there.

Just to reflect on a few thoughts, I loved Karlis' point that cities and individuals are in many ways leading the charge to both mitigation and adaptation. We are seeing so many cities doing incredible things as they are looking towards the future. They are designing adaptation plans. They are preparing for a warmer or weirder future for their inhabitants, and I think that's important.

And I would like to see more states give their cities the resources to act on those plans, and I think that's an area where we can see the greatest bang for our buck in terms of how we invest precious taxpayer resources into providing for a more secure future.

On the individual side, I think it is really a great challenge and question. And so many of us know someone who has -- they put solar on their roof. They got a battery in the garage, and they are looking to go off the grid, and this is something that I think in our countries speak so much to this heritage of self-reliance and individualism.

But I don't know that that's a feasible solution for population as a whole, and that's something that I think we need to evaluate. I do want to mention the Japanese example, especially as we start talking about liquid fuels as, you know, a huge need that we are looking forward to.

So the Japanese right now are looking at the hydrogen economy as a potential path forward. And I agree with Karlis, we are talking about 20 years of intensive investment in R & D & T in deployment if we are going to get some kind of new energy future, but Japan, because of recent history, the Fukushima nuclear disaster and the typhoon that caused it, their lack of land, their lack of shallow water for offshore wind right now and so limiting access to renewables, they moved by population away from nuclear and very, very limited oil, gas, and coal resources as they look to meet the Paris Accord requirements. They are saying the only way we can do this is with hydrogen as an economy moving forward.

There is technology that would allow them to do that today, so that gives them a starting path, but they are looking at massive investments in research and development technology to get to more efficient ways to manufacture hydrogen and hydrogen becoming that fuel to power vehicles, to power trains, to do much of that heavy lifting and moving that we rely on gasoline and diesel to do today.

I will stop there and turn it over to Karlis for his comment.

MR. CUNNINGHAM: Karlis, I will call on you next, but I warn you, you are not allowed to say something so controversial that makes the lights flicker and go out.

MR. VASARAIS: Sounds pretty good.

The inside point there, you know, this whole area and the economy is cash poor. It is true, but this company here is also very asset rich. There is huge amounts of Brownfield projects and Brownfield sites as well as manufacturing expertise in this area, which sits on the balance sheet, and for companies like one of our previous ones, we raised capital, green mantra, depulverized plastics and created glasses out of those and had an uptick value.

We picked Bradford, Ontario. Bradford unfortunately, is a city which was decimated by the loss of one of the largest tractor companies in the world, and we found a building that -- Cascas (*sic*) I guess where they used to build egg cartons. Egg cartons are very energy intense electricity wise.

And when we looked at setting up our process, our actual equipment was only $2 million dollars, but when we looked at doing a Greenfield site, we needed to spend $3 million to do a grid connection, so we worked closely with the city of Bradford to secure the site.

We were able to use their existing grid connection to draw up our capital costs, also increase our timelines, never mind an entrepreneur to work in that sort of town. Policymakers, permanent agencies, everybody is on board to make that project work and make that project work fast.

So I understand that a lot of these companies do not have cash, but let's remember they do have assets, and they do have expertise

MR. CUNNINGHAM: So by my -- actually, it is not my watch, but it has been loaned to me, we have about ten minutes of questions.

Can I invite the audience to raise their hands and ask some questions?

MS. POLLACK: What's the main technical challenge with hydrogen?

MR. GOODRICH: The main technical challenge with hydrogen, as we are looking at it right now, is making it far more efficiently, and then I would say it is building the infrastructure system to realize that at scale so that it could power infrastructure.

So right now we are using essentially an electrolyzer to the reverse of a fuel cell to make hydrogen as one mechanism for doing that. What we have seen suggested as a pathway forward is, if you have curtailment in place, either with wind or with solar where you are pushing too much on to the grid, instead of pushing it on to the grid, if you were able to on site use electrolyzers, essentially pull that electricity off grade into the electrolyzers, generate hydrogen on site, you can use that as a long-term storage, and that's primarily how we are looking at it as a mechanism within the United States.

That hydrogen becomes fuel, chemical fuel essentially that can be used for autos and for other purposes. Again, the infrastructure for that right now is minuscule and not at the scale, not at the level of investment, and it is viewed as a competing future in the United States.

So we have right now the pathway forward that is scaling is with electric vehicles. You know, where we are seeing people saying we are going to go with chemically based, you know, lithium ion battery storage for operating our vehicles as short term storage for our homes, the problems for battery storage right now is you are looking at durations for storing electricity of somewhere of two to six hours maximum, and for your vehicle it is roughly a 200 to 250 driving mile radius. Hydrogen gives you more power, longer duration, but the infrastructure and the investment is not there.

Also, you know, I mentioned First Solar and solar panels, I think a lot of people look at the electrolyzers and hydrogen based kind of fuel cells that are in place as still being relatively early stage technology and would like to see that advanced and see greater reliability with the systems before we start to see scalable deployment.

MR. VASARAIS: One more thing from the investment side, so traditional hydrogen is made by a steam affirmation. Sounds complicated, but basically, you spend a lot of energy that activates a catalyst, and you smash it with natural gas.

MR. GOODRICH: Right.

MR. VASARAIS: The carbon is released, and you have hydrogen. You have to do it at a huge scale, a half billion-dollar starting point for a plant and you cannot turn it on and off. What's the future of that? Well, one of the technologies we have invested in can actually create, do that same process using microwave technology.

So we can take something the size of a pop machine, opt in every single transportation parking lot, and when you need to fuel your vehicle with hydrogen,

it can do that same process at a very local small scale. The problem with hydrogen is that it is storage transportation and production.

Are we still emitting? Yes, but we are doing half the emissions of traditional hydrogen.

MR. CUNNINGHAM: Governor Blanchard?

GOVERNOR BLANCHARD: Yes. To David Terry, how many states in the U.S. have a renewable fuel standard, and what's kind of the range of what they are requiring these days?

MR. TERRY: Not many have a renewable fuel standard as in liquid fuel, so think of some of the Midwest states for biofuels. But the federal RFS and RFS largely replaced that on the fuel side, and on the electric side, about my last memory of that is like 38, 39 states have a renewable electricity standard of some kind.

Pennsylvania, for example, is a clean fuel standards, which is a bit different, but renewable electricity standard, about two thirds of the states, and then there are voluntary levels beyond that. That's really what has driven the renewable power market more than anything else.

If you take that, combine it with the federal tax incentives, which are largely in the processing of phasing out, those have been the two drivers at work. I would say the third one, though, that is really interesting beyond the RASes as we think of them is corporate buying.

If you look at some of those states, certainly coastal areas East-West Coast, Northeast West Coast, climate policy is driving that to a great extent. The many other locations, whether it is Facebook, Google, or Proctor and Gamble, whatever major corporation it is that has a renewable requirement or stainability goal, they are requiring that of economic development and job location in states, and that has a huge impact.

And it is really the combination of those three, and frankly, the federal tax incentive is at the tail end of that now. So lots of great progress. The liquid fuel side of the equation is quite different, however.

And I would say that one follow-up on the hydrogen question, I think the relative infrastructure cost of hydrogen for light duty transportation, it is very hard for me to imagine how we go from down that path versus an electric vehicle as we are starting to see them. It is just the cost is enormous.

We have two states that are investing very heavily in that, California and to an extent New York, to a lesser extent New York, and the numbers are just staggering. I mean, I am not sure how you get there.

MS. POLLACK: Two states investing in --

MR. TERRY: In hydrogen infrastructure, but it is staggering. I mean, for light duty transportation, it is really difficult to imagine, at least in the U.S.

MR. CUNNINGHAM: Speaking of power sources that pose difficulties, this one I am about to talk about is political difficulty, and you mentioned Japanese now are not interested in nuclear, and the Germans, of course, shut down all their facilities.

The Chinese, on the other hand as I understand it, are building nuclear plants, specifically because that's the way they want to reduce coal. What does this panel feel about nuclear energy?

MR. TERRY: I'd be happy to take that. We have -- we are not an organizational policy, but many of the states are very supportive of nuclear. I guess they come in two flavors, one being Ohio, Ohio being one of them, and Pennsylvania, New York and a number of other states that have enacted policies at the state level to compensate existing nuclear plants to keep them up.

Part of that is jobs related as much as it is reliability. I would say New York is a good example of that. It is mostly about keeping the jobs in those communities. On the smaller side, forward looking side, we have a number of states, Idaho, Utah most notably investing in modular nuclear reactor demonstrations.

MR. CUNNINGHAM: Right.

MR. TERRY: And those are quite promising. There are three or four companies that are further ahead on the private sector side, Gates Ventures, Bill Gates Venture Fund has been backing new scale for sometime, so there are good opportunities there.

I think there is a lot of receptivity to the new technology. The flipside of this, if you look at the plants in South Carolina and Georgia, the cost overruns on traditional nuclear plants, I think that pretty well closes the book, and you know there is a lot of state sensitive politics there.

But the bottom line is too expensive and not enough future opportunity on the larger scale. Smaller, wonderful opportunities.

MR. CUNNINGHAM: We have about two, two and-a-half minutes left. Do we have any more questions about this?

Our master, Stephen Petras.

MR. PETRAS: Yes. This is a question first for David and then to the others.

In the projects and initiatives that you see, how are they started? Are they starting by the state energy officials coming up with the ideas, or is it private industry that has the idea, then they are looking for support?

MR. TERRY: I think it is largely private industry, and the only hesitation in my voice, there are broader policies, and good examples are when Minnesota and Iowa, the first states that did wind resource maps, before there was even a glimmer in a federal person's eye about doing that on a national level, they saw entrepreneurs, technology entrepreneurs coming into their office, small companies heavily subsidized by state and federal dollars looking for a way to deploy.

And there were some smart state folks that, frankly, I think mostly career state folks at the time that said let's build the infrastructure if you will. They did their wind resource maps or paid for them to be done. Universities did those somehow for the national labs.

I think that's more often the case where you have some private entrepreneurs coming in, university R & D folks that have an entrepreneurial sort of edge coming into the state. They see an opportunity in the state, and the state begins to react at a very micro-level. We have a lot of incubators around the country, for example, that operate in that way.

And then, you begin to see some ground support at the state level for a policy that somehow helps that along. And I think that's the more common one. I think it is very rare that it is the reverse.

MR. CUNNINGHAM: Let me ask you about one method of financing things when you -- it came to my mind when you mentioned infrastructure. One of the things that is somewhat controversial in financing infrastructure projects is private public partnerships, and the argument, as I understand it, is they appear to work as to a project, let's say, like a toll road that produces a flow of income but not like an airport, which simply has to be -- re-do the runways and things like that.

It would seem to me that a number of the projects here would generate flows of income that you could finance by the public. Is there any interest in applying that sort of financing in this area?

MR. VASARAIS: Well, I mean, in the Canadian example, we haven't quite seen how it has gone to establish -- the Canadian infrastructure bank would be a good example of capital. The problem is that so much of the infrastructure is a public good, so you know, at least on the Canadian side, I don't think there is too much policy desire, at least, to have private hands in public goods.

MR. TERRY: Quick stab at that: I guess a couple things: There are certainly a lot of public private partnership examples in, I think, more conventional areas, building efficiency, energy savings performance contract. It is a $5 billion-dollar a year industry where you are using the efficiency savings to pay for it.

I think the more interesting area that will have a bigger impact, and it is very thorny and it is happening in roughly half the states and that's really going to reimagine what the electric regulatory impact is with the public, and it is complicated.

If you think about, at least for me, the two most heavily regulated sectors of the U.S. economy, healthcare and electricity. And it has delivered a lot of good on both counts, but you have, at least in the electric sector, an onslaught -- and in a good way -- of new technologies wanting a piece of that, and we are going to have to figure out how we are going to pay for the stranded assets that are left and for how that impacts people that have to pay for that.

And a really fast example, if you are pulling people off the grid, the people that are left have to pay for the same extra structure as they did before, or they are going to be paying more for it.

And if you think of parts of the country where population is flat or down, likely down because of efficiency, good, waste production, a variety of things, you have the same infrastructure to pay for it, and that's a heck of a challenge for the state, the regulators. It is as big of a challenge for the policymakers, distinction between the two.

The other state legislature has to decide, well, you know, we have to wave our hands and decide what we are going to do about this that is positive. And I think that's the bigger public private partnership opportunity but incredibly complicated, and my hats off to the regulators -- I know there is at least one in the room -- to figure those things out because it is not easy.

MR. CUNNINGHAM: All right. At 2:30, the termination time. I would like to say thanks to a terrific panel. This is really interesting stuff, stuff that I emotionally have never come across before, and let's give them all a big hand.

(Applause.)

MR. PETRAS: All right. We will take a break. We will be back here at 2:45.

(Recess had.)

PANEL DISCUSSION –

REGIONAL EFFORTS: STATE, PROVINCE, AND REGIONAL APPROACHES TO CLIMATE CHANGE

Moderator: Mark Fisher

Speaker: Terrance J. Fitzpatrick

Speaker: Associate Professor Chi Charmody

Speaker: Marc DeBlois

MR. PETRAS: If you would take your seats, please. All right. It is now time to start our final panel of the afternoon. This panel is going to look at regional efforts on climate change. We are going to take it from the federal to the state to business now down to the provincial and state level. We have an outstanding panel, and our moderator today is Mark Fisher. Mark is the Chief Executive Officer and Council of the Great Lakes Region.

Mark became that in 2014, the year that that institution was formed. And by the way, the Canada-United States Law Institute was a founding member of the Council of the Great Lakes Region. So it is doubly nice to have Mark here.

The other thing that you should also note is that Council of the Great Lakes Region is going to have its Great Lakes Economic Forum here in Cleveland May 6th through 8th. So make sure you put that on your calendar, the Great Lakes Economic Forum.

It starts with a reception at the Rock n Roll Hall of Fame on May 6th and goes through until May 8th. Mark is a well-recognized and seasoned strategist, policy analyst, and adviser.

He has advised the prime minister of Canada, provincial premiers and ministers and parliamentarians and the executives of major profit and nonprofit corporations.

Mark is leading the charge of the Great Lakes Council because he has a particular interest in developing economically the Great Lakes. So without further ado, Mark?

MR. FISHER: That's great. Thanks for the introduction, but what he forgot to mention is that Stephen is the new chair of our board, and we are very excited to have him as our chair. And I also reinforce our long standing relationship with the Canada-United States Law Institute.

You know, back in 2013, we had the founding conference for the Council of the Great Lakes Region, which many of you probably participated in, and you know out of that, we are also happy to have you know very, very long standing and strong partnerships with Governor Blanchard, who is an honorary patron, but also Jim Peterson who is an honorary patron, so very, very strong ties

to CUSLI and very much appreciative of that. You know, as Stephen has mentioned, this panel is going to focus on regional efforts, so the states, provinces and regional approaches to climate change. I think we can probably put cities into the mix, and I think from a Great Lakes standpoint, just to give you a bit of context and my interest in this area, I don't think there has been a more important time to be having this discussion.

I think when we look at the Great Lakes eight U.S. states, New York, Minnesota and the Canadian provinces of Ontario and Quebec, you know, if you put that jurisdiction together as one, it represents roughly a $6 trillion-dollar economy. You know, in country terms that would equate to the third largest economy in the world if it was a country behind United States and China only. You know, it is a region that has roughly 107 million people. Again, if you were to put that in country terms, you would represent the 12th largest country in the world by population.

So it is a significant region in both Canada and the United States. It is by far at the center of the North American economy in many different ways.

And for us as an organization, we are trying to bring all levels of government together with industry, academia, and the nonprofit sector to really think more strategically about that regional economy but also having together to protect the Great Lakes for future generations. You know we are here on World Water Day. Great Lakes represents 20 percent of the world's surface fresh water resources but we also forget often that only one percent of the Great Lakes are renewed on an annual basis by precipitation, runoff or groundwater.

So we have a lot of water in the Great Lakes, but it is also a finite and precious resource for us thinking of the intersection between the economy and the environment and thinking of climate change, it is just -- it is so very critical for us.

So also on this panel, we have -- I think we are going to cover a lot of different perspectives in terms of the regional approaches. You know, we have Terry Fitzpatrick who is President and CEO of the Energy Association of Pennsylvania.

We have Chi Carmody, who is associated with the University of Western Ontario Faculty of Law and CUSLI as well and Marc DeBlois, who is a Senior adviser with the Ministry of Environment and the fight against climate change, which is really interesting.

And I think when we look at the regional approaches, you know, we all know we have heard over the course of the day that the U.S. and Canadian economy is facing significant risks with regard to climate change and particularly rising temperatures.

Today and well into the future these risks as well as their associated impacts will certainly vary by country as well as by region, but there are a broad range of calming concerns, sea level rise and surges, heavy rain and floods, the rain impact on communities and infrastructure, extreme heat and the impact on human health, labor productivity, water availability and farming, public health, increased power generation and sharing needs for cooling and heating.

I think as the global and national debates regarding climate change evolve, states and provinces and particularly cities are moving forward on their own as we have heard today. I think the best examples of collaboration are the New England

Governors and Eastern Premiers, the Western Climate Initiative, which was touched on earlier today, and the U.S. climate alliance and also C 40.

The Great Lakes Region surprisingly has a long, long history of environmental and economic collaboration, but the focus on climate change, as a policy issue, are certainly lacking. And I think the persons on this panel is to delve into the roles of the states, the provinces and cities in tackling this issue. So I think, first up, I want to stark with Marc and the New England Governors and Eastern Premiers and their climate change action plan, particularly, you know, what was the main driver for them to work together, what have they done, what's next?

It is by far probably the most mature example of cross border collaboration on climate change. So I would like to explore that first. So Marc, over to you for your presentation.

MR. DeBLOIS: Thank you. Before I start, English is my second language, so I may not have the pronunciation right all the time, and I remember Mr. Godfrey mentioned Sesame Street. So if you hear a specific language or pronunciation, it comes with less fault.

(Laughter.)

MR. DeBLOIS: So the title of the conference is: Can the United States and Canada cooperate on climate change, and should they and why? Well, from my experience at the ministry of the environment in the fight against climate change and as co-chair of the climate change steering committee of the coalition of the New England Governors and Eastern Canadian Premiers, I would be tempted to change the title almost to the case of cooperation on climate change between states and provinces. Why did they do it? How did it work? And what are the results?

The conference of the New England Governors and Eastern Premiers was created in 1973. And it is a cooperation forum. The premiers and governors meet each year to discuss issues of common interest and adopt resolution by consensus to guide the regional actions. So the basis really of the plan was resolution 259, which in 2000 stated "recognizing harmful consequences of global warming is a joint concern for which regional strategic action is required."

So the Premiers and the Governers, I think the fight was a strategy point to tackle climate change. To work on that, the committee of the environment headed by commissioners and the deputy ministers and the climate change steering committee was asked to deliver the report to the region, and soon after the 2000 conference, the negotiations started, and the plan was fairly quickly accepted at the 2001 annual conference.

The findings of the regional plan, well, were similar to some of the issues I think by the Great Lakes Commission, and I am sorry if the Council of the Great Lakes is not in there.

There are so many players I missed. Some.

MR. FISHER: Too many.

MR. DeBLOIS: Too many, but the findings can be similar or are similar to what the Commission, Great Lakes Commission and the conference of Great Lakes and Centralized governors and premiers are identified later on. I will come to that in a few minutes.

The NAGCP action plan was quick and had mission strength, but the negotiation and the discussion on climate and environmental issues between the governors and premiers were not a new subject because they had cycled acid rain as early as 1988 and mercury in 1990. So that's one of the big main reasons why we were or the governors and premiers were able to move ahead and have an action plan in 2001.

So the targets, because there are targets, they are regional, but the targets identified in 2001 included short term in which is past now, but 2010 midterm target, 2020 and long-term targets 2050. This was the first time that the governments from two countries decided to tackle climate change, and it was also the first time that the long view was adopted by the governors and premiers.

That leadership was recognized by the climate group in the UK organization in 2005 and again in 2013 with awards that were presented to the governors and premiers. So they were happy about it.

A 2030 marker or target was added by the governors and premiers in the 2015 annual conference to provide further guidance to the governments between 2020 and 2050. The reason for adopting these targets -- and this is my view -- but again, many of the colleagues, which I work in a limited area had this point of view, is that the governors and premiers recognized at the time that more than 80 percent of the action required to target climate change or adaptation failed under their authority and being natural resources energy and so on.

And that the regional cooperation on the process was admitted change of success than individual on coordinated actions. So the first and foremost result of the climate cooperation was the adoption, no unanimous adoption by the governors and premiers at the time, and nothing of the plan was also adopted in 2017.

The second important result is the continued involvement. Even though there were many changes in government on either side of the border since 2001, the efforts continued as regional effort and is still undergoing.

The cornerstone of the plan really is that it does not create any really legal binding agreement between the participating government.

That said, there are more obligations associated to that and considering that each government works relatively to reach a regional target choosing priorities from the regional plan according to the characteristics and capacities.

The committee of the environment and climate change committee were tasked to oversee the implementation, and they were required to report to the governors and premiers on a yearly basis. This insured the continued interest and work of the climate cooperation.

The results of the cooperation, the influence of the climate cooperation was, in fact, in 2001. When the plan was adopted, there were three jurisdictions that had climate planning in place, and since then, as each government adopted at least and in some cases three action plans but at least one action plan further aligning their regional goal. So it was a real influence on the area or the region.

Regional cooperation, as mentioned, remained steady throughout the time, even though there were many changes. Some periods were harder than others, but still the work continued on, even though there were sometimes governors who were not as interested into the process as others.

So this is one of the results of the plan. It is -- the results, it comes from a GHG file that was created. It was compiled on the climate change during the meetings, and it includes the GHG in the region.

It is this figure provides an overview of the process, but there are other figures in the regional GHG projections that can access information on the economic sectors and see where there were reductions and where there could be possible future projection reductions. 2030 GHG projections are starting because these are historic emissions. We are starting to include GHG projection into the process, into the entry to guide or have a better understanding of where the GHG might go on the business as usual cases and try to see if we go further, where could we -- where could we be in terms of emissions and where could we be compared to 2020, 2030, and for 2050 targets?

The first GHG target, which was in 2010 was surpassed as the emissions, were more than 4 percent below the 1990 level. The 2020 target, which is ten percent below 1990, should be achieved, will probably -- won't be able to say before 2022 or 2023 because of normal delay between emissions and the inventors themselves.

But the GHG eventually or GHG emissions of the region have been below the 2020 level since 2012, so the region is in good place or good place to reach the second goal.

Discussion on the 2030 marker or target are on the way and have been accelerated since 2017. So since the adoption of the renewal of the plan and different overarching measures have been identified by the climate change during committee and by the environment. Further analysis is along the way, and once the options will be defined further, they will be presented to the governors and premiers in resolutions, and once adopted, those resolutions will drive the work of the committee. So it is sort of the whole process.

So going back west, back to the Great Lakes, we consider similarities between the two regions on the climate change issue. On the Great Lakes Region, what I found and as mentioned, but what I found of particular interest was the fact that these two already include states and provinces and are already dictated to regional cooperation, promotion of regional interest within a sustainable government approach, economic development, and social involvement so being the Conference of Great Lakes and Central governors and the premiers of the Great Lakes Commission.

Voting in two provinces and eight states are being given right to Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin. To know the Great Lakes Commission identified as mentioned a little bit earlier similar concerns as the NAGCP concerning the 2012, 2014 work concerning the climate change, and numerous references can be found in its 2017, 2022 strategic plan. However, greenhouse gas mitigation aspects as mentioned many times today have been lacking on the regional basis.

So for the NAGCP and for the Great Lakes Region, considering the interest and the possibility of possible regional cooperation on climate, the -- but going back a second, one of the key points for the NAGCP why it was a success so far is because the heads of government were at the table, were taking decision and were informed of the development of the plan because there were

reports, and on that basis -- and it is really a subject of approach -- but on that basis, the Great Lakes and St. Lawrence governors and premiers is of particular interest as part of the Great Lakes cooperation because it has the same level of authority as the NAGCP.

So looking from the outside of the region, the organization of structure to have Great Lakes climate plan is already there. A Great Lakes St. Lawrence climate change thinking or steering committee could be created under the supervision of governors and premiers to be their working body for the implementation of a regional climate panel.

So why would the Great Lakes governments want to cooperate on climate change? Well, short answer is they already do to an extent. In 2005, the Great Lakes Central governors and premiers had required Great Lakes climate change as a serious issue in the region that required action. They agreed to that in the Great Lakes and St. Lawrence River Basins Sustainable Water Sources Agreement.

This is an important step, particularly in the context of climate cooperation because the heads of government are already included in climate issues in the international cooperation process, so what's the correct wording? In law, there is precedent.

Since the adoption of the agreement, intervention and withdrawals have been managed by the ten governments. However, climate-related withdrawals have not been addressed, and science indicates that it is equivalent to the human result. That's a big slide, and I want to read all the substance of the findings of this agreement, but suffice it to say, these findings use even stronger wording than the one used in resolution 25-9 of the New England States and Eastern Canada, and that was the starting point of the New England NAGCP climate cooperation, wording such as have a shared duty to protect, must balance, must act, and lack of scientific certainty should not be used as a reason for postponing actions.

Those come from the Great Lakes Agreement to protect the waters of the Great Lakes and the St. Lawrence. So this is the basis or this, could certainly be the basis for foundation for a regional climate plan for the Great Lakes Region.

Sorry about the size of the letters there, but it is only to provide an overview of the region because the governments in the region already have targets or measures, initiative, plan initiatives, and most of them have them for 2020, 2030, and/or 2050.

And those who do not have them or some of them have also added to the U.S. climate alliance, which is another level on the regional, not necessarily adjusted state by state process but still a broader regional approach. So on the basis of these individual targets, a regional approach on climate change for the Great Lakes Region is conceivable.

Just for the sake of time I will go to the what if?

A joint effort on the climate from the eight states and two provinces to protect the Great Lakes and St. Lawrence border, the economy and the population would certainly be a great challenge for the region, but it can be based on the already successful experience of regional cooperation and governance of the Great Lakes and St. Lawrence borders.

One could consider a Great Lakes and St. Lawrence declaration of a partnership on climate change between the ten governments signed by the heads of government, defining their scope of work, the entities responsible for the regional cooperation, and the reporting process to the governors and premiers. And that's it for me.

MR. FISHER: That's great. There is a lot there, Marc. Thank you for that.

Chi over to you. You have been studying a lot about cap and trade, particularly the Western Climate Initiative.

Can you tell us a little bit more about the initiative, who is a member, how does the trading system work, and what lies ahead for WCI and what happened to Ontario? Missing in action?

ASST PROFESSOR CARMODY: Okay. So thank you very much. It is great to be here, everybody.

For those of you I haven't met, my name is Chi Carmody. I am an Associate Professor at the faculty of law at Western University, also known as University of Western Ontario in London, Ontario, and I am also and have been for quite some time now the Canadian National Director of the Institute.

The Institute, as many of you all know, is a joint creation of Case Western and the University of Western Ontario. We have been in existence since 1976, and the basic idea behind the Institute is to promote discussion and debate between individuals in both countries on issues of legal interest between our two countries.

To that end, we promote our mission by a number of different activities, including conferences like this. We also have a very successful series of experts' meetings, which normally take place in the fall every year. We publish the annual issue of the Canada-US Law Journal, which is edited by students, both here at Case Western and at the University of Western Ontario, so we have a binational group of student editors.

We have a student forum that takes place at our respective universities looking at comparative approaches to current legal problems. We just had one at University of Western Ontario on comparative approaches to the opioid crisis in Ontario and in Ohio, and we work on exchanges.

In that or from that set of broad perspective, we have also thought over the years about the importance of and the necessity of promoting a research culture and a research profile to the Institute, and in connection with that desire, that ambition, that goal, we began discussions in 2015 headed by, first of all, spearheaded by Larry Herman of our executive committee with an effort to perhaps get some donors on board who might be willing to fund research that the Institute might undertake with its students as a motivating operator in this arrangement.

And we were ultimately successful at the end of 2017 in securing funding from the center for international governance innovation at the University of Waterloo in Waterloo, Ontario, Canada, a center that was set up with a generous grant from not only the Government of Canada but also, principally, from Jim Bacilli, who many of you know is the visionary behind the Blackberry.

So in 2017, then, December of 2017, the Institute was fortunate in receiving a grant of $43,500 from CG in order to go ahead and putting together a guide on emissions trading on the Western Climate Initiative.

And this was something that happened under my aegis. I was the individual who was tasked with making sure that the research went ahead. The students were selected for it to develop their work, and all the necessary arrangements were put in place to make sure that this occurred. It was a bigger job than I ever anticipated because I not only had to look after students who were doing research at University of Western, Ontario, faculty of law, we had four on our side, but we also had in addition to that two students here at Case Western Reserve, and we had a student out at UC Berkeley in California, a student studying out there, pulling information together and feeding it to me in long memos that I had to distill down and try and make sense of this framework that is called the Western Climate Initiative.

So it was a big project, and at times, the project felt a little bit like something that could well get out of hand. We undertook it for four basic reasons. The first of these reasons was to try and profile what is happening in our region with respect to emissions trading.

So what is happening in North America with respect to what is arguably the most advanced system at a binational level of emissions trading?

We were also intrigued by the idea that the WCI, the Western Climate Initiative, is something that is promised on subfederal participation but subfederal participation across borders, and we were very interested in that aspect of what was going on because, obviously, subfederal actors are not, strictly speaking, governed by international law. They might aspire to follow international law. They might be inspired by international law, but they are not, strictly speaking, governed by international law.

So that was also something that was very interesting to us. And it was also interesting to us that the WCI itself was relatively decentralized, so it doesn't really have a sort of broad overarching secretariat mandate power over the jurisdictions that are involved.

What we were looking at is a framework that is fairly decentralized, that allows jurisdictions to harmonize their legislation together and to move forward together on that basis.

So it is a largely cooperative exercise, and that was interesting to us as well, and in addition, there was a strong corporate component here because the WCI not only involves industry specific and enterprise specific limits on emissions but is also assisted in its role by something called the WCI, Inc., the Western Climate Initiative, Incorporated, which is a Delaware-based non-profit corporation, headquartered in Sacramento, which assists relative jurisdictions in achieving the sorts of GHG reductions that are envisaged under the framework.

And finally, the thing that was interesting to us as well and we thought was very important here was the idea what was going on in North America, was sort of an experiment happening at a politically volatile time, and as we were to learn, that volatility, in fact, increased over time, and it was useful there to use this opportunity, this funding to perhaps write something of an account for a system that might evolve in directions that we had not necessarily foreseen.

So there would be a written record of what had happened, and we would be able to call on that and others would be able to call on that, not only in North America, but around the world to get some idea of how to make a system like this actually function in practice.

Well, I can tell you in the summer of 2018 it was a little bit like riding a roller coaster because here I was getting all this information in from the eight students who were providing it to me, was coming at me in big waves, and at the same time, I am one of those old fashioned people, I wake up in the morning, and I tend to look at the newspaper.

And I would go to the newspaper every morning, and it seemed like there was yet another bomb shell that was exploding across the climate change landscape changing some aspect, some little aspects, sometimes a big aspect of the work that I was doing, and so it was a tough assignment to finish up and to write, but essentially looking at emissions trading and for those of you who may not know much about emissions trading, just a sort of quick overview of what emissions trading is: Emissions trading requires caps to be established by jurisdictions and imposed on emitters in certain categories of companies.

So we have sort of broad overarching targets that are set by the jurisdiction itself, and then in participating jurisdictions, those jurisdictions then move forward with industry specific and enterprise specific caps that companies have to meet.

These caps are gradually lowered over time and because the lowering takes place, that then presents an incentive for participating entities, for enterprises that are involved to lower their own emissions and to lower them in an aggressive fashion.

And if they can do that and do it successfully and do it efficiently, some of them can reduce them so much that they actually have an excess below their cap that they can then sell to other entities that may need to use those allowances for their own emission target purposes, those that aren't quite as efficient.

So it is very important, then, to sort of establish a system of allowances under this sort of system, and it is also useful because one then gets into trading between various entities that are involved between the less efficient polluting entities and the more efficient and hopefully less polluting entities that go forward.

So emissions trading, therefore, seeks to promote sort of efficient pollution, and we realize that in putting this sort of guide together that we were drafting, the draft ultimately came to be 60,000 words with hundreds of footnotes, something that was going to be appearing in volume 43 of the Canada-US Law Journal. We realized we have to sort of focus on two broad areas. Emissions trading is also known by a marker of cap and trade.

And so we knew that we had to sort of focus our attention, first of all, on the cap, how is the cap set in a jurisdiction, and secondly, the trading, the trading that takes place of these allowances that actually goes on.

And we realized that in terms of sort of setting the cap, there is a wide range of issues that have to be death with. It is not just a matter of just picking a number out of the sky and deciding that you are going to observe this cap, but there is a whole bunch of other factors that have to be taken into account in deciding what

the cap is and how it is operationalized because remember there is a cap at the jurisdiction level, but there is also an entity by entity cap that is then imposed.

And there is a whole bunch of sort of interesting protocols that then have to be assessed. In addition to this, we also realized in sort of looking at policy framework that we would also have to sort of take apart, we would have to taxonomize how trading actually occurs, and this is very interesting because this starts to sort of speak to the sort of private nature of what goes on.

In fact, what one is establishing is a market, and markets, as you know, are complex things. They are also politically constructed things, and so one has to be aware of how that market is created and how the market actually functions. So this was a range of some of the things that we looked at in our guide.

In addition, we also conducted a telephone survey, so our initial ambition was to be relatively ambitious and move forward with interviewing entities that were covered by these caps, and we were able to establish that there were a number of entities that were covered in each of the three different jurisdictions covered by the WCI emissions trading system.

So in California, there was about 500; in Quebec about 130, and Ontario about 150. We contacted 60 of these entities trying to get some sense of how emissions trading was actually undertaken and how it was actually being sent. You know, it was sort of word on the street so to speak.

And we contacted 60 of these, including the University of Western Ontario, which is covered or was covered by the legislation in Ontario. Unfortunately, we only had five respondents, and we attribute some of the reluctance of individuals to speak to us to perhaps some of the political volatility and uncertainty surrounding emissions trading in Ontario last summer.

That said, we also believe that some of the five people who we spoke to were actually individuals who were able to give us a very good picture of what was going on because some of these individuals are actually agents who act for multiple emitters and, therefore, were able to tell us what the broad experience was in their action across a wide range of emitters.

So we believe that while there is obviously work to do in terms of sort of getting clear ideas of what is actually happening in the markets, we were able to speak to a fairly demonstrative, very good cross sector of entities notwithstanding the very small numbers, but of course, when you only have five respondents and you have got 800 covered emitters, you can always do better in terms of getting a broader outline.

So the WCI, what is it? Well, the WCI itself was an entity that was created by five states back in 2007. It was subsequently joined by a number of Canadian provinces and was also extended at one point to cover a number of Mexican states.

In its sort of form that it is, it is supposed to provide kind of a legal forum for the reduction of emissions, to assist jurisdictions in reducing emissions, and it created or its participants created the WCI, Inc. in 2011 to provide administrative support in an effort to sort of move forward with emission reduction.

Its main activities are to develop something called CITTS, the compliance tracking system that looks after the circulation of emission allowances, emission

permits across these jurisdictions, and to conduct a number of associated tasks with that.

But the sort of setup itself is sort of jurisdiction specific, so there is no compliance mechanism per se. Each jurisdiction participates in this work on a sort of its own basis.

Now, we looked at the WCI cap and trade as it applies in three different jurisdictions because these were the three jurisdictions that up until last summer were most intensively involved in cap and trade.

And we also were aware that these three entities were doing the work that they were doing within the sort of broader framework of commitments that their countries had made under the Paris Agreement, and these commitments that companies had made, as other speakers have said in this conference, were commitments made at the national level under nationally determined contributions.

So both Canada and the United States made Paris Agreement NDCs, and they were roughly equivalent, about roughly equivalent to about a 20, 25 to 30 percent decrease in emissions of GHG body or 20, 30, but this banner of works as all of you know, the United States has indicated its intention to withdraw from Paris at the earliest possible opportunity.

And on the Canadian side, what we have is a framework, a federal framework to govern in this area that seeks to get buy-in jurisdictions but, unfortunately, has not been successful in getting buy-in from all relevant jurisdictions, and what has happened is the federal government in Canada has therefore decided to and moved forward with imposing what is referred to as a backstop, and this backstop essentially requires that all provinces meet certain benchmarks.

If they do not, the federal government will step in, as I will say a little bit more about in a few minutes, to assure that they meet certain minimum thresholds, so that they contribute to Canada's Paris target.

Now, all of this is useful because it helps explain what happened in developing the jurisdictions, what the policy, I guess, impetus was in the three different jurisdictions.

We have a design phase of the WCI back in 2008 and 2010, so we come up with a broad statement of principles in 2008, and any relevant jurisdictions decide on more specific driver's in 2010 in a design document, and then in 2012, California, which is the largest entity with a population today of about almost 40 million people, decides to move ahead with cap and trade.

And around the same time about a year later Quebec implements a cap and trade system, and in 2014 the two cap and trade systems then link, so these links that are created -- and what the linkage means is that emissions permits under the relevant system are then tradeable between jurisdictions, and this link occurs because, in particular, the governor of California determines that Quebec's trading emissions program is as integrated and as intense as the plans that are set out in California.

So you have this 2014 link between California and Quebec. And then, in 2016-2017, Ontario starts to implement the same thing, and at the beginning in 2018,

Ontario goes ahead and implements its own link on to the Quebec and California system.

Now, the final climax of all this is, of course, last summer when Ontario withdraws on July 3rd. It was a dark day for those of us who believe in the system. Ontario withdraws from cap and trade, and we have to ask why that is. And in my own reading of what was taking place in this implementation phase, we really have some three different regulatory cultures.

So across the three different jurisdictions, there are different factors that explain why it is that some of these jurisdictions were able to achieve a sort of bipartisan consensus of importance of doing something like cap and trade in California.

You have this idea of California as a regulatory leader, something that has been instilled into California's political DNA for the last 40 to 50 years, and there is broad consensus on both sides of the House in Sacramento, that this is an important thing to achieve in a lot of different ways, and so California has led the United States in all jurisdictions in terms of sort of energy efficiency, energy intensity, low emission, so on and so forth, and part of that involves bringing forward GHG reductions in terms of legislation that are very, very aggressive and ambitious.

Because California has such a large population and because manufacturers are impressed with the size of the California market, they, of course, regulate and produce according to California standards, and that means that California then can start to produce a kind of regulatory shadow across the United States.

So about 20 states across the United States have actually enacted California standards as essentially their own, mirror legislation, indicating the way in which California sort of functions as a kind of litmus test, a kind of hallmark for good environmental governments.

So that's part of California's story and why California sort of leads the pack as it were.

In the case -- sorry, just trying to move forward here. There we go.

In the case of Quebec, it is a little bit different story. But it is equally compelling. In the case of Quebec, we have what is referred to as a distinct society. The society that takes different positions from the Canadian mainstream on a number of important subjects and, in particular, on subjects of sort of some centrality to the Quebec identity, and these are areas where, for example, like in culture, like in immigration, like in environment, Quebec can exercise a little bit of an international persona. This is known in Canadian international law as gerin lajoie doctrine.

So Quebec has been very, vigorous in its green diplomacy. It is one of the areas where Quebec sort of believes it has a sort of contribution to make, and it has been very active in promoting its reparative policy and sort of inventing or designing standards, environmental standards that are quite ambitious, and it also has certain natural advantages to doing so.

So we cover that in this guide, and we cover the way in which Quebec was able to sort of harmonize or harmonizing with California early on. The situation,

however, is very different in Ontario. I just wish that this clicker would work. Help me out here. There we go. Okay.

So we have a very different situation in Ontario. In Ontario, cap and trade has been at times kind of entangled with the issue of the efficiency of Ontario's electricity grid. So in the late 1990s, the Ontario government decided to break up the Ontario Crown Corporation that previously supplied all electricity and distribution to make it allegedly more efficient.

So it broke all of this up and privatizing some of this meant that prices were going to rise because there was a lot of old infrastructure involved in distribution of electricity.

And that, of course, set the alarm bells at Queens Park, the seat of the legislature in Toronto, and it required the government, then, to introduce some sort of limits on electricity prices, which it went ahead and did.

So we have this sort of limitation that takes place in the electricity grid, and the government decides that, rather than sort of upset sort of electrical markets with some sort of commitment to cap and trade -- so next slide please -- we have at the same time a government recognition that something has to be done about the environment but a real focus on ending coal. So unique among North America jurisdictions Ontario decides to go ahead and phase out its five remaining coal fire powered plants.

This is a very, very momentous decision. It is one that people like Angela Merkel in Germany have only recently decided to pattern and copy, but it is something that put the real focus of sort of environmental protection on one policy move, a policy move that, if you sort of think about it, it was rather narrow because it applied to only one set of parameters, and it left everybody else kind of in a sort of business-as-usual posture.

And thinking about it, you start to realize why there might be problems in Ontario because Ontario was not prepared or had not been prepared, and it had not developed a sort of political consensus arguably that California and Quebec already had.

So we have this great commitment to reducing the use of coal, which is admirable in itself, but it leaves the rest of the public unprepared for the sort of deeper changes that need to take place, to sign off on to something like a cap and trade system.

Next slide.

And so what we have beyond this is then a very rapid and abrupt move to cap and trade in 2016, 2017 when the Ontario government introduces legislation and then very rapidly after that joins on to the link in 2018.

So the beginning of 2018, we have this move, very rapid move to cap and trade in Ontario, and we have a very quick takeup of cap and trade by entities who are going out and purchasing lots of additional allowances at a time when free allowances were being given very generously around the province, and that raised alarm bells because what that suggests is that major emitters are going out and purchasing emissions allowances with the idea of arbitrage, that later on they would face higher costs for doing what they were doing today.

And therefore, they had to sort of try to get ahead of this by purchasing a large amount of allowances. So it was a very interesting sort of period, very interesting time.

If I could have the next slide.

And we had a number of discussions with the people we spoke to about what trading actually took place and what behavior actually occurred in the market. We have emitters obtaining allowances by distribution, by trades that actually take place at auctions and also by sales that take place on the secondary market.

We cover all of this in our guide, and if I could have the next slide, but we have an abrupt change in the political weather in June of 2018 with a new provincial government in Ontario that decides that cap and trade is too expensive for Ontario entities, and that they decide to scrap the whole system, to end cap and trade in Ontario, and to withdraw the province from the WCI. So very, very abrupt change.

And in addition to that, they decide to sort of end all funding, or they decide to cancel a number of other associated projects with that, environmental projects with that, and they provide very limited compensation, so much so that, in fact, the German ambassador to Canada was moved to remark that Ontario's actions really put a big question mark over foreign investment in Ontario in the future, and I think that that's a very telling comment.

So very, very sort of abrupt change, and if I could have the next slide, and what then happens? Well, the federal government decides to, you know, take issue with this, and Ontario is now one of the jurisdictions where this federal backstop is now being imposed because the Ontario scheme no longer meets minimum federal standards.

So today we now have this federal backstop, and those of you who are Canadian will -- and live in Ontario -- will know that this federal backstop is going to be something that you are going to be seeing evidence of on your tax returns.

I have had to complete my tax returns early because I am a dual citizen, so I have to do both American and Canadian. It is a big mess. And I have to do the Canadian's first, then the American, then the Canadian, and I noticed on my Canadian's that there were actually credit action incentives that I was given credit for in my payment of taxes, and that's the sort of indication of this federal backstop that is now being imposed because the federal government in Ottawa does not believe that Queens Park is doing enough, at least at the moment, to deal with climate change.

In addition to that, the provinces have fought back, and so the province has actually taken the federal government to Court in Ontario and also joined up with the provincial government in Saskatchewan to try and challenge the legislation in a reference.

A reference is a power that we have under Canadian constitutional law that allows the governments both at the federal level and at the provincial level to ask a hypothetical question. It is not something that is actually available in U.S. constitutional law because of your case in controversy doctrine.

So if I could have the next slide.

So what are the sort of take aways from all of this? Well, as was said yesterday and I think that John Godfrey in his comments last night was very apropos. Thinking about GHG and dealing with GHG in climate change generally requires a long-term thinking.

It is very, very difficult to try and ensure that that long-term thinking is instilled and continues. In some jurisdictions like California and Quebec, there seems to be broad bipartisan support. In Ontario, maybe we haven't got there yet. That's something to think about.

How do we build that bipartisan support long-term, and what does that consist of? And then, secondly, this issue of purchasing allocation of allowances going forward and the fact that some companies may be involved in arbitrage in the system raises questions about who gets the allowances that are freely distributed by government in the early years, a scheme like this, and who is going to profit from it later on?

This is not a problem right now, but it is something that the California legislature has identified as a potential problem in the future because governments have been sort of very, very generous in allocating free allowances at the beginning of the scheme to sort of prime the pump as it were and get people involved and entities involved.

So those are my observations. I look forward to your comments and questions at the end, but thank you very much.

(Applause.)

MR. FISHER: That's great, Chi, and it is a very thoughtful overview of the WCI. So up next, we have Terry. Terry is currently the CEO of the Energy Association of Pennsylvania. He is also former head of the Pennsylvania Public Utility Commission, so you really have seen the climate change from all sides. Terry is going to talk a little bit about how Pennsylvania is trying to square the economic and energy policies for its desire to protect the environment, control emissions. I think one big question I have based on what we have heard today is, how are you getting the politics and putting a policy mix right? You know, as was referred in this presentation and others, the effectiveness of cap and trade, carbon pricing, and Ontario is now using industrial compliance units.

I know Chi didn't talk about that too much. What's the stupid state of the debate in the U.S. vis-a-vis cap and trade, you know, nationally across various states? You know, what other approaches are being contemplated, renewable portfolio standards, mandatory efficiency targets, building codes.

There are certainly lots of tools in the toolbox for us to be thinking about. So over to you, Terry, for your perspective.

MR. FITZPATRICK: Thanks very much, Mark, and I want to thank everybody here for the invitation. It is a great other than to have a chance to talk to you about these great issues. Are you going to control my presentation back there? Great. I am off the hook. Okay.

First slide.

Just an overview of my presentation here to talk about the place where I work, Energy Association, who we are, what we do, give a profile of Pennsylvania, emergency production, and also our CO2 emissions, talk about, give an overview

about what's going on in the other states, all the different approaches to combating climate change and also talk a little bit about Canada and finally review the strategies and the path forward, and I want to give a disclaimer here.

I am here in my personal capacity. The comments that I make do not necessarily represent those at the Energy Association or its members.

Next slide. There we go, thank you.

Pennsylvania energy overview, Pennsylvania first of all has a long history as an energy producer. The first oil well was drilled there I think it was 1859, the Drake oil well near Titusville, the first commercial atomic nuclear plant in Shippingport Western Pennsylvania; drove by there, not too far from on my way here.

Also, on the negative side, coal production, which started, really picked up in the 19th century because of a real legacy of pollution in Pennsylvania but did supply a lot of the energy necessary for the industrial revolution.

The political environment in Pennsylvania continues to be generally supportive of production of energy and of infrastructure, and I will talk about the uptick in energy production in Pennsylvania a little bit later.

The development of the Marcellus shale gas in the last decade has been a tremendous game changer in the state, and finally, in 1996, Pennsylvania restructured its electricity industry so that customers could choose their supplier of electricity. So we rely on markets for the most part, although there has been a lot of mandates now, rely on markets to decide what energy prices are going to be and what type of generating plants get built.

The impact of the Marcellus shale, this chart really pretty much speaks for itself. If you look over the course of a decade from 2007 to 2018, it is really a tremendous story, a 34-fold increase in the amount of natural gas produced in the state. There was some production before, but it has really picked up amazingly.

We went from 15th to second among the states in gas production. The whole price of gas, even without adjusting that with inflation is about a third of what it was a decade ago, and the wholesale price of electricity is about half of what it was a decade ago.

Looking at Pennsylvania, comparing it to other states, really I would just summarize that chart and say with the exception of Texas, Pennsylvania is the largest energy producer in the United States.

We are here at the top in all of those categories, and then, not coincidentally, at the bottom there we are also fourth largest in emitter of CO2, in part, because of all that energy production.

Talk about some Pennsylvania's policies that relate to climate change. First of all, in 2004, the Alternative Energy Portfolio Standards Act passed. Eighteen percent of the electricity has to come from these alternative sources by 2021. And it also mandates net metering, which means simply that if you have a roof top solar array, when that is producing energy, your electric meter runs backwards.

I call that a subsidized rate because the rate, when it runs backwards, it is erasing not just your charges for energy but also all the charges for upkeeping of the grid, so the wires costs are also being erased.

All the taxes are collected through your electricity bill are being erased, all the public purpose charges, the different programs. You are avoiding all of those when that meter starts to run backwards, so there is some controversy about that, and in my own view, that that's a subsized rate.

In 2008, the Act 129 was passed which mandated electric utilities to offer energy efficiency programs to customers and meet certain goals, and last but certainly not least, there is currently a debate in Pennsylvania about whether nuclear power should be added to the ADPS Act. My association is neutral because of disagreements among our members on that, so it is a really tough issue.

Here is a chart that shows Pennsylvania greenhouse gas emissions since 2000. I won't go into all the details of this, but I think the important take aways are you can see that greenhouse gas emissions are down, somewhat not dramatically but somewhat down since 2000.

And if you look at the different components of that, the thing that jumps out the most is, the emissions related to electricity production are actually down, and I think that reflects the shift there coal to -- yes, from coal to natural gas in generating electricity because natural gas emits about half the amount carbon coal does to generate electricity.

We passed the Climate Change Act in 2008 that probably doesn't have a lot of teeth in it, but it is something, developed an inventory of greenhouse gas emissions and a registry emissions, prepared an action plan and update it every three years.

The 2018 draft action plan, which is not finalized yet, calls for 26 percent reduction by 2025 and 80 percent by 2050, and I think that's generally keeping with the international agreements and saying that's the amount of reductions. We need to keep the rise in global temperatures to two degrees.

Governor Wolf signed an executive order in January of this year. He basically said the Commonwealth shall strive to meet those emission reductions I just talked about, and I put parens around those words because they are not currently the policies in place to get us there, but that's going to be some of the debate I think we have going forward.

Now, I should mention the politics in Pennsylvania a little bit. Governor Wolf is a Democrat. The legislature is controlled by Republicans, so some of the friction and you talk about here about the problems in Canada you have in Pennsylvania as well.

Next slide.

Overview of other state climate change policies. I just gave a list there. Twenty nine states have renewable portfolio standards similar to our ADPS Act. Twenty states have mandatory energy efficiency targets like we do in PA. Thirty eight states mandate net metering, and then eleven states address the problem directly, generally through a cap and trade program, and Professor Carmody was talking about California.

I think two northwest states, Washington and Oregon are probably in that, and then the biggest group is in the northeast with the regional greenhouse gas initiative, which is a trading program that is electric sector only. It is not economy wide, so it doesn't cover transportation fuels.

California climate change policies, I spent a lot of time looking at California, and the whole array of policies they have and because they are such a case, I think professor Carmody said I tried to list their main policies here, and I am sure there is a lot more I didn't put here, but they have vehicle emission standards.

And they kind of set the tone for a lot of the country that follows them in terms of those efficiency standards for cars, and there is controversy over that with the federal government right now.

They have a cap and trade program as the professor talked about, mandatory energy efficiency. They have mandated, not only do they have a renewable portfolio standard, but now they have gone so far as to mandate 100 percent clean energy by 2045. They mandate -- they also mandated solar panels on all new homes starting in 2020, and we have -- we have the premature closing of the San Onofre nuclear plant and the planned closure of the Diablo Canyon nuclear plant coming in a couple of years.

When I look at all of California's policies, I think they have done some good things, and I think the CO2 cap and trade program is the best. My personal opinion is, I question the cost effectiveness of a lot of the other things they are doing, though. Canada, I have a couple slides here on Canada.

I will be the first to admit I am not an expert on Canada, but I did some research just to be able to compare them to the U.S. And I don't want to go over the things that the professor talked about, but Canada is a signatory to Paris. They have not pulled out like we have.

They have in 2016, they announced they are going to have a minimum price on carbon beginning in 2018 and 80 percent or something a little bit different about Canada versus the U.S. Eighty percent of their electricity comes from non-emitting sources like hydropower, wind solar, and the others.

I did have a conversation with Marc DeBlois from Quebec, and he pointed out to me that while that's an average in Canada, the provinces are actually a lot different. Not everybody reflects that average, which causes dissension. The provincial response, I am not going to go over all this, I will just try to summarize, I think similar to the U.S. you have tension between the provinces and the federal government, and in the U.S., you have tension between the states and the federal government.

You also have agreements on exactly how, even if you say, okay, I want to combat climate change, what are the policies going to be exactly to do that? I think you have some diversity of opinion there from what I can see. Go ahead. Okay. What climate change policies will work.

And I have opinions on this, but the current U.S. approach relies heavily on mandates and subsidies. And I think what that results in, unfortunately, is that political popularity, not cost effectiveness, ends up being the criterion for whether these things get enacted or not, and I think there is a big gap between public perception about what works and what really does work.

The regulating emissions directly I believe is much more likely to yield cost effective results. There is a paper I read that has been very -- I have been very much influenced by, by Lawrence Makovich, Harvard School, "Tilting at Windmills."

If you want to read something that is thought provoking, I highly encourage you to read that. You know, when I looked at these issues, I will confess my bias tends to be -- I tend to be a Republican. I was involved in helping to draft Pennsylvania's electricity restructuring law, so I tend to favor markets. But I tried to look at these issues and see what works, and I took a hard look at what California does, and I am really sceptical of a lot of the cost effectiveness in a lot of what they are doing.

The Makovich paper does a case study of California, and I will just give you a couple of things that he said about California. When you look at the full array of policies and he concluded that the CO2 cap and trade program was ten times more cost effective in reducing emissions than the their renewable energy mandates, which would lead you to think, well, you ought to lean more on the CO2 cap and trade program rather than the mandates, but instead California went in the opposite direction.

And they came up with this mandate for 100 percent clean energy, and then they passed a law that said all new homes, even though they had a housing affordability crisis, it passed a law that said all new homes have to have solar panels beginning in 2020. So that's my opinion when these things on what I think works.

There are some really hard political realities when it comes to combating climate change, I think. And I think that, first of all, it is a tough complex problem, and I think political polarization is part of what makes this difficult, too.

You know, on the right, you hear climate change is a hoax. Anybody hear that term used in reference to climate change?

(Laughter.)

MR. FITZPATRICK: But the left, you had to keep it in the ground movement, which I also personally think is misguided, you know. I think if you put a price on carbon, you let that price drive -- I don't think there is anything inherently evil about fossil fuels.

I think our societies have been moved forward a lot by fossil fuels, but I don't deny that they have undesirable environmental consequences that have to be dealt with in some way.

And then the Green New Deal, which I think is well intentioned, but when I look at the amount of government involvement and the government dictating, you know, how we are going to do things? I really question whether that's the right way to go.

Another thing I would encourage and look at or something thought provoking, the Washington Post had a series of editorials after the Green New Deal came out, and they talked about how to do this, and they said, you know, this is such a big job, we really can't afford to waste resources, and they called for a market-based approach, which I think is probably the right way to go.

There is this populism which has affected our politics about everywhere I think and has a big impact on this as well. And I think the populist view is that climate change is something the average person really kind of rolls their eyes about, and I see this sometimes talking to people and the view that something only the elite worry about, and I think something that supports that, if you look at the

yellow vest uprising in France, which had been driven, in part, by the gas taxes, you know, I think that illustrates the challenge in trying to come up with effective policies. And I think fact-based public education about all of this is something there is a crying need for.

So last, can and should Canada and the U.S. cooperate in climate change? Well, obviously, yes to both questions, but in my view, the more immediate problem is to try to develop a consensus for policies that are really going to be effective rather than just trying to give people the impression that you are solving the problem.

Thanks very much.

(Applause.)

MR. FISHER: Thanks, Terry, to that very rich presentation. We are getting close to time, so I think what we will do, I will put one question to the panel, but I want to open the floor to some questions as well.

And maybe taking everything that we've heard today and maybe putting a bit of a focus on the Great Lakes because I think that that's where I do see an opportunity and where climate change seems to be lacking, you know, it is obviously a complex region. We have the two federal governments.

We have got an international framework and International Joint Commission Bounty Waters Treaty, Great Lakes Water Quality Agreement. We have got the Great Lakes Commission; we have got the Great Lakes-St. Lawrence governors and premiers; we have got Great Lakes-St. Lawrence Cities Initiative.

There is a complexity there that doesn't necessarily exist in dealing with Eastern Premiers in terms of the governance. You know, how do we -- where should we start in terms of trying to get those levers, those interests, the sectors around a common table to start thinking about this because I don't know if the Great Lakes Commission or the governors and premiers can do it on their own, on its own in a region like this just because of the governors' complexity and legal framework that exists.

So where do you think is a good starting point in terms of putting us on a different path to thinking about climate change in the region? Chi, I will start with you.

ASST PROFESSOR CARMODY: Well, I think one of the things that has been driven home to me in the comments today -- and I am going to be saying to you words about this in my closing remarks -- is the enormity of the problem. I mean the scale upon which we have to act is huge, in multilayer. And I think what I have taken away from today's observations without wanting to put too fine a point on it is just the idea that we need a broad base of task force, and we can't simply think that the direction is always going to come from the top. We are going to need to have states and provinces working together.

We are going to need to have municipalities working together. We are going to need to have industry associations and individual enterprises working together, and there may on occasion be differences. There may on occasion be snafus. There may on occasion be the need for strategic litigation.

We are going to have to approach this in a very, very broad way that is going to approximate, I think, what John Godfrey was saying last night. We need an all-

government approach, and that's not only going to be government in the classic sense, but it is going to be the broad-based approaches from civil society that are going to allow us to challenge this in a meaningful and effective way.

MR. FISHER: Good point. Terry, what do you think in terms of this region in Pennsylvania? Sometimes it thinks of itself as a Great Lakes state; sometimes it doesn't. It certainly is economically and environmentally, even though there is a sliver on Lake Erie, you know, recognizing that very few governors show up to the meetings.

Like how do we start a regional conversation, cross border conversation about climate change in such an important economic region?

MR. FITZPATRICK: Well, you know, again, our divided politics makes it tough. Whenever you talk about climate change with Republicans, it tends to be kind of a difficult thing, maybe particularly in an energy producing state. But I do think we are getting closer to that.

I think there is -- I do think there is going to be more of an initiative, more of a push to get Pennsylvania to be part of the regional greenhouse gas initiative, and I think that's as part of that trend, I think there is more of a chance that we will be cooperating with things like the Great Lakes group on these issues.

MR. FISHER: Yeah, that's great, and I think maybe the alignment of maybe democratic governors might help with that push a little bit.

Marc, your sense in terms of your experience with both WCI but also New England governors and premiers. Quebec is the center piece between those two initiatives.

MR. DeBLOIS: Yeah, yeah. Well, it is definitely a complex issue, but I would tend to go back to basics. Who gets between them when things go wrong? Is it cities, municipalities, counties, governors or presidents? Well, the first things that we hear normally go to the governors and the premiers.

So on that basis having -- because the implementation is already tackled.

MR. FISHER: Sure.

MR. DeBLOIS: Maybe not perfectly but at least tackled for the mitigation aspect.Who would be responsible for a GHG regional cooperation to mitigate emission? If I look at the United States and Eastern Canada, it is the premier and the governors. So that could be the framework or the main structure, so having governors and premiers agreeing to something --

MR. FISHER: Sure.

MR. DeBLOIS: -- and then having a structure underneath them because there is a need for structure.

For the NAGCP, there are the governors and premiers, but underneath there is a whole layer of opportunities. There is the two secretariats, one on Eastern Canada and one on the New England states. There is a cooperating committee composed of international relation people, and then underneath that, there is a whole set of different committees, committee of environment, which is responsible for or was and still is, but the action plan on acid rains as received or accessed or finished its target, and they haven't renewed yet new targets; mercury same thing. Climate change is selective.

We have a few years ahead of us, but that committee, which is composed of commissioners and deputy minister, which is high level, still has underneath them a climate change steering committee composed of directors and professionals, so the main work is -- the process works up and down.

MR. FISHER: Rolls up, rolls down.

MR. DeBLOIS: Yeah. It is not the governors and premiers say "I want this" and then it gets executed, and yes, it is part of the process. But it is also bottom up because sometimes they are trying to change the steering committee, and so eleven jurisdictions think of something, and they say, well, why not, and then they propose it to the committee and goes up the chain to the governors and premiers, and if they say yes, then we implement it.

MR. FISHER: Sure.

MR. DeBLOIS: So it is on that basis governors and premiers have to be involved into the process if something in mitigation aspect is to be conceivable for the Great Lakes Region.

MR. FISHER: That's really helpful. Why don't we take a couple questions from the audience?

I know this is stealing a little bit of the break, but we have had a lot of breaks today, and this is an important part of the day. Are there some questions from the audience about what you have heard so far? Or is everybody tired out?

MR. WEIDENBACH: For Mr. Fitzpatrick: Does Three Mile Island still resonate with Pennsylvania voters, and secondly, have you done any surveys to see if there is a difference between Eastern and Western Pennsylvania citizens regarding the importance of climate change as a political issue, or is age a bigger factor?

MR. PETRAS: You have to state your name.

MR. WEIDENBACH: The question was --

MR. PETRAS: We heard you, but just your --

MR. FISHER: Just your name for the record.

MR. WEIDENBACH: Jeff Weidenbach.

MR. FITZPATRICK: Three Mile Island still resonates. I live not that far from there. You know, most mornings I can look out and see the steam coming off from unit 2. But it cuts both ways.

There are some folks, there are some environmental groups that are -- I can think of one environmentalist who I am friendly with in particular, but he still is against Three Mile Island. But you do have some environmentalists that are for it now because of the climate issue and carbon, and this battle about adding nuclear to the ADPS Act is a really tough one because of the jobs that are at stake and because of the -- you know, right now when you think about it, we are all talking about climate change, right? But there are no consequences for emitting carbon, so you know, Three Mile Island produces no carbon, but they don't get any advantage in the marketplace because of that under our current policies. So it is a really tough debate.

West versus East, there is a difference between Eastern, particular Southeastern Pennsylvania much more progressive leaning, but I would say James

Carville once made a famous comment about Pennsylvania. It is Pittsburgh and Philadelphia and Alabama in between.

(Laughter.)

MR. FITZPATRICK: And that was pretty funny, but there is a grain of truth in that because the middle part of the state and the northern tier of the state tends to be more conservative, but the Pittsburgh area, too, even among the democratic labor movement tends to be more conservative on a lot of issues than Democrats elsewhere.

And you can see that if you followed anything about Connaland (*sic*) running for Congress and some of the policies that he promoted and giving the pledge that he wasn't going to support Nancy Pelosi to be Speaker. You see some of that blue dog influence in Western PA.

ASST PROFESSOR CARMODY: I also recall that I think Donald Trump has said that his climate policy is made in Pittsburgh, not in Paris.

(Laughter.)

MR. FITZPATRICK: To which the mayor of Pittsburgh took exception.

MR. FISHER: Stephen, question.

MR. PETRAS: Yes. This is actually a question for the three panelists. Chi, you talked about the Western Climate Initiative. Marc, you talked about what's going on with the New England states and Quebec. Terry, you talked about your association of energy producers, but my question is: How do your initiatives start?

For example, how is it, Marc, that all those states, Connecticut, Rhode Island, plus Quebec, who came up with this bright idea, why don't we join together and come up with some carbon cap and then same, Chi, how did the Western Climate Initiative, whose idea was it? Was it an institution? Was it a professor like Chi Carmody who came up with it? What about you, Terry, what about you, your group, and your members, how do you generate ideas, or does your group generate ideas on how to deal with climate change? As a group do they say, "you know what? We got to reduce carbon."

How do you guys think about that?

MR. FISHER: Who wants to take that on first? Terry and then down.

MR. FITZPATRICK: Yeah. Well, we are not energy producers technically. We are the distribution utilities, which is separate, but I have worked, represented the power producers as well. You know, I don't know really -- there are a lot of different groups that you go and meet with, maybe similar to like the Great Lakes groups and regional conferences, for example, national groups, national groups and utility regulators, those ideas sort of percolate around there, and there are some regional discussions about various things, which I guess can grow into things like the regional greenhouse gas initiative if the political will is there to work together and do it.

MR. FISHER: Chi?

ASST PROFESSOR CARMODY: So one of the points that became clear to me in examining the WCI from an outsider's perspective is that the WCI, something like the WCI is a very constructive effort.

It involves the input of many, many different actors over a long period of time. You might say broadly that governors at the top political level come together at a

very initial stage to sort of set up the grounding, the foundation for the discussion, just the discussion of a lot of these issues, and what's interesting about the WCI framework is that you first have the floating of a series of principles.

Then, two years later with the work of a lot of different working groups from across all of the different jurisdictions involved you then have the launch of a design document that gets fairly specific as to timetables, caps, allowances, considerations. These couldn't have been drafted by any one mastermind.

They require a lot of different actions together, and I think it is the fact that the action itself reflects a broad base consensus about the smart way to move forward. That's the ultimate magic that gets these things sort of, at least in the case of the WCI, off the ground.

MR. FISHER: Before we get to Marc, that WCI case, was there one governor that was it, California, that really stood up and said, "hey, we need to build this broad base consensus. We need to have this discussion"?

ASST PROFESSOR CARMODY: So that wasn't evident from my reading of it, but California was certainly pivotal in the sense that its documents reveal regulatory framework that is very concerned about linking with and making sure that the link has comparable intensity and a comparable integrity, and those two factors have to come together in order for the governor of California to certify that some other jurisdiction then may be able to emit permits and trade those permits on a par with California.

MR. FISHER: Sure. Marc?

MR. DeBLOIS: And as for the New England Eastern Canadian Premiers, I would say time and ties. Time, because if you recall in the presentation, I mentioned that energy committee was created in 1973, the action, the climate action plan came in 2001.

But in the meantime, the premiers and governors met each year, and they still meet each year to discuss different issues, and the first issue they were discussing were economy, trading, tourism in terms of relation, and eventually, in the 1980s, well, the environment started to be brought to the table, and they accepted it, adopted it, and developed it and adopted the acid rain plan in 1988, second one in 1998, and at that year, they also produced a mercury plan.

And from then on, it is a buildup that was seen in terms of getting to a climate change action plan. At the time, it was not past border as it is today, so it was a bit easier, but still it is a complex process, and for the Great Lakes Region, well, the ties are the meeting that has been occurring, not necessarily as often as the energy CP. But still the structure is there to at least bring the discussions to the table to seek interest.

So on that basis, I think there is a potential to create something in the Great Lakes Region because of the ties, because of the organization already in place and already working.

MR. FISHER: Okay. I guess one question I would have for you, Marc, and really I look at the governor groups really across the border, so New England, Eastern Premiers, Great Lakes, Western Governors, I am curious, what's the participation rate like in the New England Eastern Premier, like when you have an annual meeting, do all the governors and premiers show up?

Like is it -- I am curious because I know when I have done research across the border, it is really mixed in terms of commitment. So what is it like in New England and Eastern Premiers when there is an annual meeting? Do they all show up?

MR. DeBLOIS: Okay. So I will take that in French and talk really, really fast. Well, honestly, normally the governors and the premiers are already there, always there.

MR. FISHER: Sure.

MR. DeBLOIS: If they can't be there and sometimes happens for different reasons, election whatever or a crisis, they send a representative, commissioners, either environmental or energy, which are more frequent, but there is never an empty seat.

MR. FISHER: Sure.

MR. DeBLOIS: Even when there were governors that were really not keen on climate change, someone was sitting there. Then, many times the governor who was not necessarily that interested but the governors saw interest in having other discussions with the other governors and the premiers.

So it is not necessarily just talking about climate change; it is all of the issues, and so the value of keeping the discussions even if they did not necessarily agree on one topic, they continued the discussion because the other elements in the equation were important enough to do that.

MR. FISHER: Yeah, that's instructive. Thank you. All right. I think that's probably it. Thank you, everyone.

(Applause.)

MR. PETRAS: Well, everyone, the chairman, the co-chair of this organization, Jim Peterson said I think we need to press on instead of taking a break. Everybody agree with that? So Chi, are you ready to summarize the day's happening for us.

ASST PROFESSOR CARMODY: I am.

MR. PETRAS: And now our Canadian national protector, Chi Carmody.

(Pause.)

ASST PROFESSOR CARMODY: So this year's topic climate change was something that was introduced to us last night by a very masterful after-dinner speech by John Godfrey, who reminded us that climate change is a very complex topic, something that is going to require, as I've said and as he said initially last night, a sort of whole of government approach to the issue if effective solutions are to be found.

And Godfrey had suggested to us in his remarks the broad outlines of what some of these solutions should be like, but in the meantime, I think what we see around us almost defies the imagination. It may be a long way away like the events that have just happened this past week with the situation in the Mozambique and city of Beira and cyclone Idai battering that city. But I think it is something that goes on all the time, and it happens right around the corner from us. We might pause to think what it would be like if that same cyclone had barreled through a city like Miami instead of Beira or a city like Mississauga instead of Beira. I just haven't seen it happen here and happen yet.

And I say yet because it is really, really real, and we were reminded of that in excellent comments this morning by Dr. Eugene Takle who pointed out in his compelling opening remarks that there are and there will be very significant costs on infrastructure, on forests, on agriculture, on human society, and social stability going forward because of climate change, and what are we going to do?

Looking at just one example that he referred to, the situation in Syria and the millions of refugees that streamed out of Syria over the last couple of years flooding across Europe. As a result, the anti-immigrant sentiment in its wake and the follow on political effects of the flows and what they triggered in groups like the PIS in Poland and for some of you who are familiar with German politics, Panagota, this anti-immigrant group that has achieved some notoriety in Eastern Germany.

All of this arguably triggered, at least in part, by a drought in Syria, a long way away. What are we to make of all of this? Well, we can look at the federal level and the particular relationship, the peculiar relationship between our two countries at the current juncture and be just a little bit mortified and perhaps somewhat depressed.

Yet, I think, as Jim Blanchard wisely reminded us, whatever is going on at the top is something that is inevitably going to change. There are other efforts in governments going on in the meantime.

There is some evidence of this in the decisions that were mentioned this morning of the new House of Representatives to establish a house select committee on the climate crisis this year.

In addition, Jim Blanchard and other speakers have referred to the Green New Deal, although on the panel that I sat on, Mr. Fitzpatrick expressed some skepticism about that, and David Terry profiled for us how many, many changes are taking place at another level, the level of states.

And beyond that, too, Karlis Vasarais reminded us that maybe it is not huge projects but smaller projects that we all get involved in together, smaller more manageable bite size projects at the personal, the neighborhood and the city level that will get us to our 2030 targets instead of these vast Amazonian inspired projects that we might be thinking about climate terms in change of currently.

Like many initiatives in this area as well, legislation is going to require, an action is going to require consensus, and it is not going to be perfect. Speakers like Martha Hall Findlay pointed out that peripheral legislation like Canada's proposed bill C-69 on an environmental assessment could be very useful, but we are going to have to be committed to continue to talk, and as Hall Findlay emphasized this morning, to recivilize -- and I point this out -- to recivilize our political discourse, to listen, to try to come up with some sort of consensus that is both respectful and inclusive across the political spectrum.

She pointed out and I take note of the fact that when we think we have all the answers we are mistaken. We need to hear from the other side, and we need to consider all sides, and this is something that has perhaps been lost in our political discourse over the past couple of decades and is now coming to a fulcrum.

And so with many comments about the corroded political environment, maybe the tremendous challenge of climate change can be a way for us to relearn to talk to each other.

We also heard from Peter MacKay this morning, that dealing with climate change is a matter of leadership, and as one which can be very personal and as Jim Peterson has pointed out or again from both MacKay and Hall Findlay, that markets matter.

The investments that are being made to counter and adopt to climate change are impressive. We need more of them. We need more hydro as MacKay pointed out, we need more electric cars and subcities for them. We need more cleantech, but we also need and seem to need more almost everything except climate change.

And that's important because like most optimists and most entities, I think today have accepted most of the science behind climate change as Jim Blanchard remarked in his comments.

So there is a lot of work going on, if not perhaps at the top, and there is still much reason to be optimistic. If nothing else, I think we can leave this conference being, as Lana Pollack reminded us, starving optimists.

So on that note I would like to close these remarks in thanking all of our sponsors, particularly our platinum sponsor DLA Piper, our golden sponsors, the Consul General of Canada in Detroit, our silver sponsors Steptoe & Johnson, Herman and Associates, Cleveland Cliffs, Baker Hostetler, and our bronze supporters Taft, LLP, Formica, and Barudan America.

I would also like to thank my fellow institute co-directors, Steve Petras and his lovely wife Colleen Fitzpatrick Petras, who joins us here today, and I note a connection between Terrence Fitzpatrick and Colleen Fitzpatrick Petras. So that suggests there is a lot of different convergence that go through Steve Petras. It is the mastermind of the project here.

(Laughter.)

ASST PROFESSOR CARMODY: And I would also like to thank and especially note the work of our institute's infatiguable managing director Ted Parran, who is very shortly to be a proud papa.

Both Ted and Steve have worked very hard over these past few months to bring this conference, a very inspired and very thoughtful conference together, and they continue to do so year after year with great efficiency, with great imagination and with great enthusiasm.

It is ironic perhaps that we are meeting here at the Cleveland Botanical Garden, a building designed to celebrate botany, which oddly is being so directly put in peril by different climate change events.

So thank you, everyone, very much. Safe home, and we look forward to seeing you next year, April 16th and 17th, 2020, here in Cleveland for the 44th annual conference, and I would like to emphasize that the Canada-US Law Journal is always looking out for thoughtful, thought provoking and very credible submissions. So if you do have them and you are interested in getting published, please feel free to get in touch with us, with me, Chi Carmody at the University of Western Ontario Faculty of Law.

We would very much like to receive your submissions, and we thank you very much. Now for a few words from our co-chair, Jim Peterson.

(Applause.)

HONORABLE JIM PETERSON: Chi, once again a wonderful summary. Thank you so much. You've given thanks to so many people here, but they deserve it so much.

This has been a wonderful conference. Let me just close off by this little memory I have of a 15 year-old Swedish school girl, Greta Thunberg. She is the one who started to boycott her Friday classes in high school so that she could pickett in front of the Swedish legislature on behalf of climate change.

Here is what she said this winter at the world economic forum in Davos. She said "adults keep saying we owe it to our young people to give them hope, but I don't want your hope. I don't want you to be helpful. I want you to panic. I want you to act as you would in a crisis. I want you to act as if your house is on fire because it is."

One week ago she was nominated for the Nobel Peace Prize. I think the work that we have started here in CUSLI will mean that next year we are nominated for the same prize.

(Laughter.)

HONORABLE JIM PETERSON: Thank you all so much.

(Applause.)

DISTINGUISHED LECTURE – AN UNCHARTED PATH: CANADA-U.S. RELATIONS IN THE TRUMP ERA

Bruce Heyman[†]

ABSTRACT: This is the annual Canada-U.S. Law Institute Lecture given by Bruce Heyman at Western University on September 24, 2019. The United States is withdrawing from its traditional role in the world, creating opportunities and threats for our allies and adversaries that we are just beginning to come to terms with. Bruce Heyman poses important questions for Canada in light of this: What are the implications if Donald Trump is re-elected and these extreme behaviors persist? How will this impact Canada and the values we historically held together? Will Canada move ahead without its next door neighbor - and if so, what are the risks that go with that?

So thank you, thanks for your hospitality and convincing me to make this journey to a town that of all the cities I've visited this is my first stop here and I'm really enjoying the -- the last couple of days. To the Dean, thank you for having this event here at the law school. And to the Canada-U.S. Law Institute, thank you again for inviting me.

Okay.

So today, um, I'm probably going to provocatively leave you with more questions than answers. But clearly that's my intent in this conversation today. So here's what I want to do to get started. We're going to do something that we generally don't do on a daily basis but we're going to time travel. So all of us, position yourself and propel yourself into the future now. And we're going to fasten our seatbelts and arrive one day after the U.S. elections in November of 2020.

Or should I say the re-election. Donald Trump is re-elected President of the United States.

Yup. He lost by 5 million votes but again won that Electoral College. People across the United States are stunned. Can't believe it. Many Democrats thought they had this one. They're depressed, and yet angry at the exact same time.

After a couple of dozen Democratic candidates for president, Democrats are kind of lost, looking for maybe a new path. We're a country divided. We were divided going into this election and now the stresses of the division will be exacerbated.

At home calls for impeachment rise once again. And this time the speaker is on board but the likelihood of the Senate convicting him as still quite small.

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Institutions in the U.S. government are under stress. They've been under stress but they're now crumbled as people who contemplated leaving in 2019 and 20 throughout the government stayed on, anticipating the government would have changed. Whatever damage you thought was done in that first term, well now the path is becoming more permanent. Thousands of U.S. government employees now preparing resignation letters. Many positions, like in the previous four years, will remain unfilled and those that are occupied will be occupied by Trump loyalists.

With defunding of government agencies, the functioning of many normal services will be delayed. To some it may even mirror the Eastern-bloc pre-Berlin Wall type of democracy. Bureaucracy. Capitals around the world, with only a few exceptions, are in shock once again. The first Trump victory was deemed an aberration, but now with the Trump re-election it's clear America is and will continue to be a very different place.

Several departments of the U.S. government will be effectively closed. One department that stands out most notably is the EPA -- the Environmental Protection Agency. After the previous year of dismantling environmental regulations from prior administrations, the Trump White House has turned over to corporations for corporate self-policing in the spirit of regulation reduction.

By the way, the White House also promises to continue to take funds from closed agencies and departments to fund that wall down at the Mexico border. You know, the President had promised Mexicans would pay for it. So this first new day, he decides once again to put tariffs on Mexico to help pay for that wall, kind of as a post-election fundraiser.

On the world stage, any hope of America's reversion to the global protector of liberal democracy, small L, small D, is dashed. No longer a strong guiding force for good offsetting the extreme, America has become the extreme in an inward-focused, xenophobic, unilateralist nation, and will continue along that path, unfortunately, for the foreseeable future.

The fall. Let's talk about that. So much of this second term, foreign policy will be focused on President Trump's life-long beliefs. You know those beliefs that every country in the world has and continues to take advantage of the U.S.A.

(Laughter).

Well we're not going to take it anymore, says Donald Trump. So specifically he begins to go back on his long-expressed concerns that trade is stacked against the U.S.A. and promises extensive new tariffs on the basis of national security. Oh he also declares NATO, any nation not immediately meeting the 2% spending of GDP on defence will either be kicked out of the alliance or we're going to slap some new tariffs on them so they can pay for it. Simultaneously the master deal maker, maybe even proposed Russia join NATO, especially after he successfully invited them back to the G7 at his G7 meeting at his resort.

(Laughter.)

Oil drilling will soon begin off the coast of Alaska in the Arctic. And the President proposes perhaps even additional drilling as a result of Mideast continued tensions -- maybe even in the Great Lakes, where he believes, with no scientific evidence whatsoever, that large amounts of oil exist.

Why should I even begin and have this conversation in this way? Why should we think this way? Looking into the future is really hard. Just forecasting the weather has its limitations. But predicting political winds are even that much more challenging.

Yes, in some ways this is completely hypothetical. In some ways it's extreme. But in other ways, it's entirely possible.

We can just imagine the ways of Trump re-election would impact climate, the environment, commerce, energy, military, intelligence, homeland security, international affairs. The list can go on and on and on. But here's the reality. Most presidents running for re-election for the last 100 years have won. Those that aren't re-elected have been due to weak economies. And I'm not rooting for that.

(Laughter.)

So all things being equal, which they never really are, but all things being equal, a Trump's re-election is a distinct possibility. What does that mean for our international relations and, more specifically, Canada?

Well we don't know exactly. But like fire drills in an office tower we don't believe the fire's coming but if it does I sure want to know what the plans are and where the exit is.

Today, here in Canada a federal election is underway and much of it -- much of a lot of things are appropriately being discussed, and of course most of its on domestic issues. Internationally, the important relationship with the U.S. while not -- not the smooth functionality of the Trudeau-Obama era, I think things are generally in better shape than they've been in over these last few years during the Trump government.

After navigating a renegotiated NAFTA and disposing of the inappropriate steel and aluminum tariffs on Canada, the Canada-U.S. relationship is generally working well. Clearly, the issues with China and how Canada has found itself caught in between these two superpowers continue to persist, but overall, given the range of possibilities, the relationship is in about as good a position as one could hope for. Especially relative to relationships the U.S. has with other nations around the world right now. But in the event Donald Trump is re-elected that balance will be tested. So knowing this possibility what types of things can Canada do to prepare itself?

The reality -- as I said at the beginning -- there may be more questions than answers. But I thought a realistic assessment of some of the many questions Canada may face would be a constructive way to have this conversation today.

When I became Ambassador, I set out in a speech in the National Gallery in Ottawa, a broad set of objective of my tenure covering various subjects. Trade, energy and the environment, cultural diplomacy, international affairs, and of course, the functioning of our shared border. So let's talk trade for a minute.

NAFTA. A revised NAFTA. That deal's not done yet. It may not get passed if the administration doesn't adequately address the problems that exist in this agreement. So if it doesn't get passed, what is the path ahead? The range of possibilities ahead is wide, but the most challenging path is that the U.S. withdraws from the existing NAFTA.

I know people who say 'he can't do that.' Or, 'not to worry, we'll fall back on some previous trade agreement that we have or the W.T.O.' But I think if the President does that, the uncertainty that he will create will indeed hurt the Canadian economy. In addition, global tariffs are generally a bad course. And the impact is affecting decision-making by businesses all around the globe.

Self-proclaimed "Tariff Man", who said trade wars are easy to win, may indeed dial up trade wars and tariffs in the second term. Canadian businesses should game out these scenarios now and build in contingencies for both raising tariffs on non-Canadian goods but also potentially as well as new tariffs on Canadian goods. Or products like Uranium which was already debated on the basis of national security just a few months ago.

Finally, I think Canada has this really unique opportunity to go on offense. You see, Canada has several very large international trade agreements already in place: CETA with Europe, CPTPP trade with Asia. Canada may be better positioned on international trade given Trump's behaviors on trade and tariffs than the US.

I think Canada should also continue to expand talented immigration and expand skill sets especially as the US is closing its door. You should keep your immigration open in your own way—in your own way but we're in a battle. A battle of old economy vs. new economy. And in fact, the old economy jobs continue to be threatened. They've been initially threatened by low wages and low wage countries and moving jobs overseas. But now, automation is replacing jobs at an incredibly fast rate. Canada needs to stay focused on the new economy and if it does, it could find itself very well positioned for this next economic landscape.

Let's talk energy and the environment—they go hand in hand—energy and the environment. We have to take into account the carbon impact and the environment and bring it together. But now we're on a new and dangerous path that will only get worse as the administration continues to reduce or eliminate pollution standards in the United States. So in a world, where countries, virtually all the scientists, and millions of people recognize that climate change is real, the US Federal standards are continuing to get weakened and continue to potential put Canada in a very uncomfortable position.

Just look at the legal battle right now under way between the U.S. government and the state of California and the auto industry on mileage and pollution standards. Canada will be further challenged between the two worlds of carbon based and clean economies both at home and abroad.

Geopolitically, liberal democratic order of this post WWII, Canada has been a middle power and has always relied on being there with your big brother or might I say big sister, U.S.A, at your side. But a self-focused, xenophobic, isolationist president has left Canada to fend for itself. A perfect example of that is the retaliation and stress with Saudi Arabia leaving Canada alone fending for women's rights and suffering the consequences. You also see it with China and the competition for implementing illegal extradition.

The question, the question you will have going forward will be how to handle future requests from the U.S.A. What if those challenges and those requests from

the USA challenge your values but line your pocketbook? How will you confront social injustice when the cost of doing so continues to rise?

For me, today, while the UN General Assembly is all together, a Canadian seat on the UN Security Council is more important than ever. See, the world is losing its defenders of liberal democratic order of things and I believe this increases the importance of having Canada's seat on the Security Council, but it probably makes it harder as President Trump may be more transactional in supporting who gets this seat. Canada, are you willing to transact?

And there's NATO. The second term, as I mentioned, Trump will probably force countries to make sure they spend at that 2% level or out. Or adding in Russia. But look, we have NORAD which protects North America. We have the Five Eyes, the intelligence community, and others areas of cooperation. Will these be dismantled? Are these going to be jeopardized? Or a breakdown, a result of the behavior of the United States just as the world moves ahead without the U.S.A in the Paris Accord or TPP. Will the world move ahead in these other areas? Will Five Eyes become Four Eyes without the United States because of the lack of trust of the intelligence community of the president?

Culture. Let's talk culture for a minute. Free speech will be under attack as fake media could move to fake everything. Especially if Trump doesn't like the narrative—it's just fake. So for me, I think of the artist and the voice of the artist through their work, that may be threatened. Movement of art and artists and media under threat at the US borders.

You see today, we're even seeing it today. Reporters being rejected to come to the US. Art being turned away because they think it is inappropriate because some border official is rejecting it. But tomorrow's border policies can get even worse. So when I arrived in Canada, people talked to me about the Canadian/US border in this term: thick vs. thin. If Donald Trump is re-elected, one has to assume they may thicken substantially.

What happens if individuals are further micro-targeted at the border because of race, because of religion, because of background? What happens if the US federal government does a crackdown on something? Maybe it's marijuana use. What happens if enhanced inspections are instituted? Heightened immigration fears in the USA will cause people of diverse backgrounds not to be admitted to the United States just because border officials may fear that if they come for holidays, they may not leave–so just not let them in.

But I think there's another thing that Canada needs to focus on and the real impact may increase migration northbound. Plan for it. Prepare for it. The American refugee. In light of news of what might happen if Donald Trump makes a threat to Canada for personal or political gain at the expense or the benefit of the country below, what will Canada do? We just have seen this with Ukraine and these issues. How should you handle this as a country? What happens if Donald Trump's international policies continue to impact Canada adversely à la China, other sorts of retaliation, or additional Chinese retaliation is directed toward Canadians? Many questions. Not easy answers. But Canadians need to prepare because this is a distinct possibility that this could happen.

Let's talk the economy. The path of things under Donald Trump and the huge opportunity for Canada I think lies ahead. See, back about a hundred years ago or a little more than a hundred years ago, the world moved from agrarian to industrial. We experienced rising wages, rising productivity, workers got new jobs. Next came corporate movement of jobs to lower cost labor markets so that started farming jobs out to the detriment of both Canada and the U.S. Those were the early days of the stress of NAFTA which unfortunately, is being portrayed in that way today. As he [Trump] says, "the worse agreement of all time."

But there still exists a world today where increasingly automated job replacement is taking place. But it is a world where highly skilled workers are increasingly in demand. So my recommendation to Canada in that world is to continue to focus on RND, continue to focus on immigration, continue to focus entrepreneurial activities, focus on education. In this new world, Canada should lean in aggressively. Again, I want to reiterate, position yourself for the new economy. It's here, it's happening and it's happening fast.

Relationships, we all have them. Friends, family, partners. Relationships are based on trust. That the same whether it's between companies or countries. Even when there are disagreements we have a set of rules in engagement. A set of standards. Laws, we're all learning laws. But what happens when one party doesn't respect the standards of interaction nor believes the laws pertain to them? Or to further complicate matters, what happens when one party plays by their own set of rules and yet expects you to respect the law? You have a breakdown in that trust.

This has happened between the Trump administration and institutions and organizations at home and abroad. And in a second term, relationships will be further tested and Canada, this relationship will be tested as well. You'll need to navigate very carefully and very creatively in a world like that. How you do this I think may be one of your biggest challenges.

So this discussion today is meant to be a first step, a reality check. Do I think Donald Trump is getting re-elected? Well, I didn't think he'd win in the first place.

(Laughter.)

So I'm making no assumptions here! Anything is possible. The lecture is a message to you. Don't be complacent. Prepare for a next Trump administration and the world it might create.

Back in the embassy I had a senior officer who worked with me at the embassy and when I first arrived, I came in and I said, "so, tell me about the challenges between the US and Canada." She looked and me and said "Sir, there are no challenges. There are only opportunities."

So as difficult as we, the United States, make it for you, Canada—especially if Donald Trump is re-elected—you will have boundless opportunities if you're willing to grab them.

(Laughter.)

Thank you.

(Applause.)

AUDIENCE MEMBER: If the U.S. economy slips into a recession or an economic crisis, how do you think the Trump Administration will react and handle it?

MR. HEYMAN: So for those of you who couldn't hear, let's talk about a potential recession in the United States. And then how will that impact the U.S., Canada, and what do you think Trump will do?

So let's break it down a couple ways. First of all, recessions happen. It's not if – we're going to have a recession. It's just a matter of when. It's part of the natural cycle of things. This cycle is particularly extended and it's longer than most, and part of that is the base in which we started. We started at such a low base section – the 2008-2009 economic crisis that took place.

So the first question that might be applicable here is, is that recession coming between now and election day or is that election coming *after* election day?

(Laughter.)

And I will say the following: I'm concerned about the next recession. I always get concerned about recessions because it impacts people and it's hard and, you know, stock markets decline, etcetera.

But in the U.S. let me just give you a few statistics that you can think about which give me unease as to how tenuous the economic is right now in the States. First of all, stock market's morale is huge, unemployment's near 50-year low, so we've got all that good news at the headline level. But below the headlines, the gap between rich and poor and the focus of where that wealth has been created – in the 10%, maybe in some cases really the top 1%, of the people in our country have gotten that wealth. The bottom end of the spectrum had not really increased their wealth at all throughout this last cycle.

In fact, the Federal Reserve has said that, you know, something more than 40% of Americans have less than $400 reserved. 40%. Almost half the country has less than $400. Recent surveys say that 78%, up from like, low 70s, live paycheck to paycheck. So just getting one paycheck, spending the money, getting the next paycheck.

And picture this. It really just happened, really, at the beginning of this year, when the federal government, the U.S. government, shut down as a result of a dispute between Congress and the White House. In two weeks' time, the U.S. government employees were at food loss. So it's a real stressful point where once we experience less, which happens in recessions, that things could get very, very difficult very quickly in the States.

The second thing is that private equity has blown way out of proportion in terms of valuations, and I think there's a lot of services that have been provided throughout the States even up here, through things like Uber and Lyft and delivery of food and goods, and We Work Space. All off that, all of those things have been done at a loss. You're buying all those services at below cost and these companies have been able to exist, been able to fundraise, both in private equity, or debt markets, or equity markets, but they keep operating at losses. I think in a recession those companies are going to be under stress. So they're either going to raise prices or go out of business because you can't keep operating at a loss, especially if you lose your sustenance, the capital, that's coming in.

So the Federal Reserve has very little room to keep lowering rates. Rates are really low. Congress has very little room to spend a whole lot more money because we're running huge budget deficits. So the cushion is not there. You know, like a squirrel saving nuts for winter – we're actually eating all of the, you know, the nuts and when winter comes it's going to be a lot more challenging.

And the world is slowing down quite a bit right now because of these tariffs. Businesses can't make economic decisions, so we're seeing numbers in Germany throughout Europe, Japan, Asian, China – everything's slowing down.

What's keeping the U.S. a-prop is the U.S. consumer. We spend a lot of money. 70% of the economy is consumer-based, and so it's still being propelled and lowering interest rates are doing it. The President is screaming for a couple of things. He's screaming at the Head of the Fed to lower rates a lot, like keep lowering, because he sees the slowing happening. So he's trying to get interest rates even lower.

The second thing is he's throwing out ideas of cutting taxes again even though we're kind of like, tax cut out. He's trying to find ways to stimulate things. He may actually come up with an idea for big expenditures. Big government expenditures next year. But I don't know if Nancy Pelosi and the Democrats are going to go along with all that and big infrastructure projects take a long time to go. You can't just like, wake up, let's spend a trillion dollars on infrastructure and you know, it takes a long time to build roads, bridges. You've got to get permits, you've got to do analysis.

So we're going to have a recession. I'm worried it's going to be really difficult. The tools in our toolbox are diminished. Not completely gone. And you guys saw 70 plus, close to 75% of your exports go to one country and that country is the United States. So you feed into it. Some large portion oil and gas, some large portion autos, and other things, and so you'll be impacted by it and you should prepare for it as well. Because as the U.S. will go I think the Canadian economy will, you know, you can't avoid it, you're just too linked together as two economies going together.

Historically, I would say Canada has not gone down or up as much as the U.S. economy. Like if the U.S. did this [gesture of tall wave with hand], Canada's always like this [gesture of small wave with hand]. I think personality-wise it's like that too.

(Laughter.)

I would say, though, I think you need to really work hard on, you know, save some money. Be prepared. Understand the path that may lie ahead. Sorry for the long answer but it's something that I am personally concerned about.

AUDIENCE MEMBER: You mentioned drilling for oil off Alaska and the Great Lakes…But I'm wondering what you think the President's endgame is with respect to energy movement between Canada and the United States. We're having our own problems with pipelines as you know, but it seems that he blows hot and cold in terms of whether or not the pipelines are going to come across or not.

MR. HEYMAN: Figuring out how Donald Trump behaves or believes on a given day is really challenging.

(Laughter.)

I think in general his number one goal is, you know if you listen to some of his speech today in the UN, he is all about U.S.A., U.S.A., U.S.A., U.S.A., U.S.A. He doesn't think multi-lateral, he doesn't think bi-lateral. Everything is a product of what's just driving home. And so he's fracking, and drilling, and going, and looking everywhere for energy. That all being said, I believe the energy component for the United States is deeply dependent upon our imports from Canada – energy from all sources.

I think that the recent military activity that took place, the attack from Saudi Arabia that took place, demonstrates the security of our energy as a result of our relationship with Canada. And I think I'm, you know, I'm appreciative of that. I gotta believe that the people around him, especially the large money donors to his campaign, which are very energy-based, at least some segment of it is, that they're going to be proponents of the U.S.-Canada energy relationship and continuing to grow it.

The challenge, then, is the people on the ground. New faces here in this country, with regard to pipelines. I mean we have dozens of pipelines between Canada and the U.S. It's just the new incremental pipeline, when you call somebody and say this is, do you believe in it, some parts of the country go, "sure, I believe in it." "Great, it's going through your yard." "No, no, I don't believe in it that much."

(Laughter.)

And so it's this new need, 'not in my backyard' exists, you know, everywhere. I think people in concept are much more favorable for different things as long as it doesn't directly impact them. So where are we? We're highly dependent on Canada for energy. We continue to assume it. I think, though, the path ahead for fossil fuels is, regardless of whatever the Trump Administration is doing, is declining. And will continue to decline over time as alternative energy source become cheaper and cheaper. I think you've got to prepare for that. But there's a short-term, medium-term, and long-term gain for energy.

The short-term game is this is still, you know, we're still using it. I still took a plane here, a car here, still use fossil fuels, and I don't see that changing anytime really soon. The problem with a pipeline, or some of these other big infrastructure projects, are that they hope to get paid back over 30, 40, 50 years. Well, I think in the fossil fuel business you can see how five and ten—beyond ten it gets more challenging. And so, you know, that's the issue of where we're going to allocate capital to build things new, and I think that may be a bigger part of the equation than the permissions that would be granted to put these pipelines in. These are expensive and who's going to allocate their capital to do this if they think it's going to go away and the product's not going to be there anymore.

It's kind of like, you know if I went around a few years ago and said I've got this great idea, we're gonna put in more Blockbuster locations all over the country.

(Laughter.)

And we've used videotapes for a long time, isn't this a good idea? You're like, "I don't think so. This new technology may be putting them out." You know, it may very well be that the oil and gas industry is the Blockbuster equivalent. But I don't know the timeline. If I knew the timeline I could give you a better answer.

AUDIENCE MEMBER: I listened carefully to your presentation and appreciate you very much. I particularly like the topic of the NAFTA agreement that you mentioned a couple times, as well as the CVT. But I think you have not mentioned CETA, which is the Canada European Union Trade Agreement which came into force in 2017. I would really appreciate if you can maybe give a little bit of those kinds of political positions of the U.S. towards that Canada-European Trade Agreement.

MR. HEYMAN: So the President thinks in really bilateral terms. He has a really hard time, and we've finally been able to get to this new NAFTA on trilateral terms, but he's really having challenges on a multilateral basis. He doesn't operate that way. Either he thinks we're getting taken advantage of, or…

So remember he got out of Paris, he got out of TPP, he-you know, really the Iran deal was a multilateral deal although it was Iran, but a lot of European countries in the U.S. were all involved in this. He just needs to, he's talking now "I'm gonna do China alone. I'm gonna do Japan alone. I'm gonna do each of these deals, one-off deals." And he doesn't think about the collective. That's harder when Europe operates as a collective. So his answer, instead of saying, which he talked about today, he said "Britain leaves, we'll do a deal with Britain." Hello, you've got all the rest of Europe sitting there. What about that? Why don't we talk about doing a deal with Europe?

He can't do it. I just don't think they operate that way. And I think as I mentioned in my remarks, I think that's the competitive advantage that Canada now has. That you now have these two deals – you basically have the world map now, of where you can do trade. So a company that comes to Canada can actually export to the entire world, especially if NAFTA is done. I mean, you're gonna have most of the economy of the world. You've got Europe, you've got Asia, you've got this [gestures]. I mean, I would take advantage of that. As a country I would continue to lean in, knowing, of course, that the U.S. is not entering TPP, says the President, the U.S. will not do CETA. The U.S. is going to be left out of most of these big deals. And again, I think that's a competitive advantage Canada has on the U.S. now, and if there's a Trump re-election, I point out that that's a big opportunity for the country.

AUDIENCE MEMBER: I'm just wondering, in your own opinion do you think that the private-sector development agreement that he recently made with Brazil, was in good faith that this was going to be a good agreement with the Amazon?

MR. HEYMAN: Who? He, Donald Trump?

AUDIENCE: The U.S. Mike Pompeo and Brazil's Foreign Minister.

MR. HEYMAN: I'm not deeply steeped in that specific agreement, but I will tell you that I worry about the word trust and reliability. That what good is an agreement if you enter an agreement and you don't trust the party to abide by the laws of the agreements that you work on?

And I think that the biggest indication of concern for me, was when we had just signed this North American new deal, and it was just signed, and then the President says, "I'm gonna put tariffs on Mexico." On the basis of immigration. And what he's done is he's weaponized, now, economic tariffs that were used only

for economic outcomes, historically, he's now weaponized those. And so then the answer is, "well, how do I rely on and trust you?"

Interesting thing that's happening, just a side note, you've got Japan, where he is saying that "I'm working on a trade deal." He, Donald Trump, is saying I'm working on a trade deal with Japan. The word out over the last couple of days is Japan is saying, "okay, we can do this interim deal but I want a guarantee you're not going to tax my autos." And I think it's an impediment for the guys to say, "well wait a minute, I want to be able to tax your autos."

Well, that's the great thing that your sitting Prime Minister actually got accomplished. He slipped in that letter that basically said Canadian autos would not be tariffed, and he had it as part of the deal that was signed. It went into effect immediately. Even if the trade deal doesn't pass in the U.S. he's got this deal with Donald Trump that the Canadian autos aren't going to be tariffed. And so I think the Japanese are going, "I want one of those."

(Laughter.)

Right? "I want one of those?" Which is effectively putting a squeeze on the President. And so the question is will they do the deal with Japan? If he does the deal will he give the auto exemption? That's his big threat tool out there, I mean, it'll be fascinating to watch.

I-I don't trust him. He lies every day, he puts people in different positions. So I have a hard time trusting his deals and because you know he hasn't demonstrated that he lives by his word, and so that's my challenge. Brazil or not.

AUDIENCE MEMBER: Yeah, that was my concern. Particularly with this point with climate change, and it being such a – dominating the world stage at the moment. And he's making deals to invest in the Amazon.

MR. HEYMAN: He doesn't believe that climate change is a man-made condition.

AUDIENCE MEMBER: Exactly, so to respect the Amazon, and start exploiting land and people.

MR. HEYMAN: It's pretty sad what's going on there.

AUDIENCE MEMBER: Hi, my name's Connor. So you mentioned the Iran deal, you talked on Saudi oil rigs…So, I guess, now with U.S. troops going into Saudi Arabia, pulled out, I'm wondering about the potential for conflict. Is a precondition for the tensions cooling between the United States and Iran a new president? We hypothesized about a Trump re-election, so I'm wondering, perhaps, what your thoughts are on how the Iran-United-States relationship will proceed if he's re-elected.

MR. HEYMAN: So the President has this perverse approach to things, of, you know, it was like when we were doing health-care: repeal and replace. It's, you know, kind of like if you need to go to work every day and drive your car, but I'm going to take your car but don't worry I'm going to get you a new car *some time*. You're like, "wait a minute, on Monday I need to get to work."

He has this mentality, so he's used that mentality with abrogating agreements all around the world. So instead of going in on Paris, and saying you know, let's fix Paris so it fits for me, for me, the U.S., or wherever we are. By the way, I think

the U.S. is actually meeting the standards for Paris right now even though he said we're getting out.

But TPP he's gotten out, Iran deal, he's getting out. And he's not – he's like, "now we'll work on the replacement." So it puts the U.S. in a very difficult negotiating place and creates a lot of havoc. And so I think, had you taken the position I don't like the deal we have with Iran currently, so I'd like to come in and sit down and here are the things that I'd like to get corrected. Let's all work together, Europe, and the Middle East, and come together, and if we don't, here are the various outcomes that will happen. And I'm going to put these in place if this doesn't happen. That's very different than "I'm out. Now let's do this. By the way I'm slapping sanctions on you, by the way I'm squeezing I'm squeezing I'm squeezing you", which is forcing them to respond. You squeeze somebody hard enough, they respond. You punch somebody, eventually they're gonna punch you back.

And you think that this whole Iranian move came out of the air, like he's like, "wow, Iran's really acting in a bellicose way." Well, you've been squeezing them economically so hard that they're going to have to do something otherwise the economy is going to fail and there's going to be anarchy domestically. I think we're playing a very dangerous game right now. Very, very dangerous. It's like a President who's flicking matches in the dry woods and, you know, is it going to catch on fire? I don't know, but it's getting more and more dangerous as the days go on.

I'm for diplomatic conversations and working together and finding paths, you know. In the John F. Kennedy's book Profiles in Courage, he talks about the word compromise. Compromise isn't equated with weakness, it's actually a strength. And we've got to find paths to compromise and find paths to win-win, as opposed to keeping us in an I-win you-lose mentality. So if I'm gonna win you gotta lose.

I think the world is better off in a time where the U.S. wins and the counterparty wins simultaneously. But he's not of that mindset. So I don't know where it goes and that's the uncertainty that causes the anxiety of where we are. And especially I think he's emboldened because we have so much oil in North America now that we don't, we're not beholden to it in the same way. Which should be another reason why we're not messing around there to begin with. But unfortunately, we are.

AUDIENCE MEMBER: Can you comment on the relationship between Trump and the administration's policies with the judiciary. And the tensions that has resulted from them.

MR. HEYMAN: As a result of?

AUDIENCE MEMBER: His policies like, separating families, or bans on certain groups.

MR. HEYMAN: So the judiciary is not a monolith. We think about it may in this one way, but the judiciary in and of itself is made of individual judges and courts. And you go to a court and you ask for an opinion, especially if you think something's wrong and you bring a case against somebody. What he's been doing is very rapidly replacing judges or nominating, putting positional judges that follow his philosophy and his party's philosophy to an – almost to an extreme,

whether it's at the Supreme Court or on down. And so the relationship should be professional but not linked, right? We should have three distinct separate branches of government that all act, you know, independently, but work together in running the functioning of our government.

But he's trying to stack the courts, he's working very hard to do this with his accomplices in Senate. And so I think that there's still some courts, California district courts, and so forth, that still have more liberal bias, overall. That are protecting some of these rights and doing these things. So it depends where you know, cases are brought. And so people kind of are very careful about where they bring various cases and how those come about.

So just think 'the courts' have very different sets of outcomes. But if he gets a second term it will dramatically change the footprint. We're already doing that, but you will dramatically change the footprint of the court system of our country. And remember many of these appointments are for life, and he's appointing a lot of fairly young-ish – everybody's young to me –

(Laughter.)

– young people and so the impact could be profound for a second administration.

AUDIENCE MEMBER: Thank you for your thoughts…I was wondering if you could talk more about your response to Trump's speeches and to his approach to the UN in general and his resistance to the collective.

MR. HEYMAN: You know, I didn't hear all of his speech, and so, but it's clear he used the tone, "Looks it's about me, and me being the U.S." It sounded to me like a campaign speech, almost like setting up for 2020, with the exception of very distinct messages to China and to Iran. But aside from that, it was all about, you know, protecting the unborn and you know, I'm going to – you know, his views of the border, and what he can do. And I'm always fighting for Americans and all of us will always fight for our people first, and he used language that sounded very campaign-esque to me. Which isn't a surprise, because it was probably written by a lot of people who have, you know, desires for him to be re-elected.

I do think, his strong-tone on China – it'll be interesting how they received that. China, which I don't think he fully appreciates, is in large part about how they want to save face and not be embarrassed in the process of you know, relationships and standing, etcetera. And I think you can get a lot done if you could do it quietly. That's not his style. To stand up on the world stage at the UN, and to take a stick and wack around China the way he did – I don't think that's constructive to reach a larger deal and the question is, what – you know I absolutely think China, Iran, others, have the President boxed in because of the way he approaches thing. So it'll be interesting to see how each party wants to play him right now, knowing he's so focused on his re-election.

AUDIENCE MEMBER: Obviously Canada's really close relationship with the U.S. has been advantageous in a lot of ways. You mentioned there's a lot of opportunity there. But I was wondering at what point does that asset sort of become a liability, particularly with a Trump 2020 possibility, as the U.S. increasingly demonstrates no regard to the rule of law – both international and domestic…At

what point does it actually hurt Canada to be so immensely interconnected with the United States.

MR. HEYMAN: So I think that's the big question for you as a country, as you watch these behaviors and as they get, you know, more and more exaggerated. I can't tell you what that is and what point do you put your values above, you know, other outcomes. As I said, your values and your pocketbook may go in conflict, going forward. And, you know, is it all about jobs? Is it all about selling product? Is it all about that? At the same time, you may find yourself stepping into a place – a dark place, from a value perspective. Or are you willing to sacrifice some part of that, you know, threatened relationship to stand up for your core sets of beliefs.

I think that will define the country going forward, if in fact we get a second Trump Administration. I think it's a defining time for the country. You're a middle-sized power in terms of economic, military, size, everything – but you had outsized influence on the world stage promoting this liberal democratic order of things because you've done this in partnership with their neighbor. And we've done this together and you've had the support of the United States all along the way even if there are policies that we disagree with.

We have, generally, been in agreement regardless of Democrat, Republican, conservative, or liberal, we had certain ideals that we promoted – that small L and small D level Democratic order of things. If that then is in jeopardy, which it is right now, if it continues along that path, what is the path that Canada wants to take for yourself?

And the purpose of this conversation today, is to spur those conversations that you have to ask that now and, you know, you're better to be proactively thinking about the possibility of this happening as opposed to just getting surprised, and be in scramble mode trying to deal with the fact that it's happening and circumstances around it then start whirling away every day coming at you. Your ability to operate strategically may be limited at that point. You're just tactfully responding to the U.S. and I think that would be a bad place to be.

I'm hopeful. Look, I'm gonna work really hard to make sure this doesn't happen. But I'm also cognizant of the possibility of this happening.

AUDIENCE MEMBER: Which Democrat do you think has the best chance of defeating Trump?

(Laughter.)

MR. HEYMAN: Well according to polls, any person walking in the streets could defeat Trump but I'm not sure that's accurate. It's way in advance, more than a year away from where we are. Tell me where the economy is, tell me what actions he's doing, tell me what he's doing in terms of abusing our relations internationally, what he's doing on guns, what gun violence is taking place domestically at the time, treatment of women and minorities, and where we are. You know, I think there are different candidates based on that environment actually. I'm all for this process that we're going through. It's painful and long, different than Canada with people you know, you have to just understand your parties select who the leader's going to be and that's what you get.

You pick, you know, whichever party – your choices are the Liberal Party, Conservative, the NDP, Green, this is it. This is your weird universe. For us, we

pick the person who's representing the party. Now there's something big move afoot in the U.S. that Trump feeling threatened in some way in his primary system, he's basically shutting down the primaries. So the selection process is changed. Maybe looks a little more like the way you guys have done it here, and the party just picks the leader and that's the way it is, as opposed to the people. So I will vote for anybody who runs against Donald Trump. That includes if there are any Americans in this room. I will vote for you if you decide to run.

(Laughter.)

I mean in all seriousness I think that, you know, we have elected somebody who I don't believe thought he would win. I think found himself in a position. He is being the extreme of himself and I think that it's causing such great damage at so many levels. But I think this damage during four years is repairable. Eight years is more permanent.

I meet with many of these candidates. I say "good luck, keeping going. If you're the nominee I'll be there with you."

Last question, go ahead!

AUDIENCE MEMBER: If this possibility of Trump 2020 takes place, do you feel that our current Prime Minister is prepared for all those possible worst case scenarios?

MR. HEYMAN: I'll tell you what. As the former U.S. Ambassador it would probably be inappropriate for me to dive into your election at this time.

(Laughter.)

I'll let Canadians decide.

(Applause.)

I just, think, you know, it's more important that the U.S.-Canada relationship is strong. And whoever occupies 24 Sussex, albeit it isn't occupied right now, but whoever occupies 24 Sussex or the White House, my goal is to promote the U.S.-Canada relationship. The reason I'm taking the position I am so strongly against the President, which I never would have done in a post-Ambassador role…I'll tell you my thinking, which we can then bring this together.

So two things. In the United States, the term Ambassador and the title, different than Canada, is for life. So I get this title for life. I think that comes with responsibility and I owe something back for that.

Secondly, when I swore to preserve and protect the Constitution of the United States against enemies foreign and domestic, when my term is over as Ambassador, you don't, like, swear out.

(Laughter.)

You take an oath. I feel that today I am still under that oath. And I feel some of the things and many things he's doing, and saying, and the way he's operating, is a threat to the Constitution of the United States of America. And thus I am taking a perhaps significantly bolder step than a Former Ambassador would ever take and putting myself way out there in trying to do what I can to tell my best friend in Canada, "hey guys, this is bad. And it could get a whole lot worse, so I'm here to help the relationship going forward and back at home I'm working hard to try and find paths to tackle the damage, fixing the damage he's doing, as well as making sure he doesn't do any more."

With that, thanks for taking time out today.
(Applause.)

CRUISING THE GREAT LAKES: A REPORT ON THE UNITED STATES AND CANADIAN REGULATIONS FOR THE COMMERCIAL CRUISE INDUSTRY ON THE GREAT LAKES

Theodore V. Parran III[†]

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INTRODUCTION AND EXECUTIVE SUMMARY

The Great Lakes Commercial Cruise Industry: Regulatory Hurdles and Opportunities

The tourism industry has undergone immense growth globally since the 1950's. In today's global economy, travel and tourism is the world's largest service industry, contributing trillions to world GDP. Given that the industry has become such a diverse and potent economic driver, competition for increasingly informed and discerning consumers is fierce. Against this backdrop, North America is the fastest growing geographical region in the tourism industry, thanks in large part to the high-quality destinations and visitor experiences available in the United States and Canada.

In this context, the Council of the Great Lakes Region has recently conducted a study of the tourism industry in the Great Lakes to explore possible growth areas. A key finding from the Council's study is that, while the Region punches above its weight in visitors and jobs, it only drives 15% of tourism related revenues and 19% of tourism related GDP in North America. The study also determined that domestic tourists account for 84% of all tourists to the Region.

In spite of the current data, the Council's study, as well as other sources, indicate robust growth potential for tourism in the Great Lakes and for the cruise industry in particular. For example, The Great Lakes Cruise Strategy report found that, with the right marketing and economic development strategy, the Great Lakes cruise industry has the potential to grow to roughly 180,000 passengers served a year by 2028. While this opportunity exists, the commercial cruise industry in the Great Lakes remains relatively unknown and with limited service.

Aside from the concerted actions needed to promote the Great Lakes cruise industry, the unique nature of the shared U.S.-Canada border throughout the Great Lakes presents a novel legal and regulatory environment. In the commercial cruising context, long-standing maritime regulations and services such as cabotage, passenger screening and security, and pilotage present complex legal and regulatory challenges, resulting in added compliance and operating costs for potential cruise operators. This report seeks to provide a working guide for the Council and industry groups to aid in identifying where specific legal and regulatory hurdles exist, and provide a roadmap for possible resolutions to these issues.

THE GREAT LAKES MARITIME & TOURISM INDUSTRY

I. Overview of the Great Lakes-St. Lawrence Maritime Transportation System

The Great Lakes-St. Lawrence Maritime Transportation System[2] (MTS) is the longest deep-draft inland navigation system in the world. The MTS includes the five Great Lakes (Superior, Michigan, Huron, Ontario, and Erie), their connecting channels, and the St. Lawrence River. Canada and the United States share four of the Lakes and the St. Lawrence – only Lake Michigan is entirely within the United States. The MTS extends 2,300 miles (3,680 km) from the Gulf of St. Lawrence on the Atlantic Ocean to the North American heartland, and serves more than 100 ports in the eight Great Lakes U.S. states (Minnesota, Wisconsin, Illinois, Indiana, Michigan, Ohio, Pennsylvania, and New York), as well as the Canadian provinces of Ontario and Québec.[3]

Lock infrastructure enables vessels to navigate the roughly 600-foot (180-meter) elevation change between the St. Lawrence River and Lake Superior. The section of the MTS between Montréal and the Gulf of St. Lawrence is open year-round to navigation, while the other portions of the system are seasonal.[4] Given its unique geographic, geologic, and ecologic makeup, the MTS is best understood as a single, comprehensive system that spans two nations. As such, it is fundamentally different from other coastal regions in the U.S. and Canada and, in many ways, requires governance that recognizes and accounts for these specific characteristics.

II. Overview of Great Lakes Tourism and Commercial Cruising

The Great Lakes themselves, and the urban, cultural, and natural attractions that are located on and near them, have long been a compelling destination for vacationers. Beginning with natural attractions such as Niagara Falls, lake islands such as the Bass Islands in Lake Erie and Mackinac Island at the juncture of Lakes Michigan and Huron, and a number of scenic riverine ports on many of the lakes, increasingly urban populations began viewing Great Lakes as the perfect summer getaway as early as the 1870's.[5] Formal tourist attractions like Cedar Point on Lake Erie and major urban centers with thriving arts and entertainment scenes like

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[2] This project will be considering navigation on the entirety of the Great Lakes – St. Lawrence Maritime Transport System (MTS) for a number of reasons, chiefly that: (1) the MTS is in many ways a single system from a geographic, geologic, and ecologic perspective; and (2) the entire MTS is governed under Canadian and/or U.S. federal law that applies to significant portions, or even the entirety, of the system.

[3] Mike Piskur, Management of the Great Lakes-St. Lawrence Maritime Transportation System, 42 CAN.-U.S. L.J. 228, at 229-230 (2018).

[4] *Id.* at 230.

[5] *See A History of Tourism*, NIAGARA FALLS NATIONAL HERITAGE AREA, http://www.discoverniagara.org/heritage/history-of-tourism/a-history-oftourism/#.XOAnSshKgjI (last visited May 18, 2019); *see* Laura Johnson, *A Quick History of Sandusky Industry, from Ice Harvest to Tourism*, ROCK THE LAKE (Feb. 21, 2018), http://www.rockthelake.com/buzz/2018/02/quick-history-sandusky-ice-harvest-tourism/; *see Victorian Era*, MACKINAC.COM, http://www.mackinac.com/about/history/victorian-era.

Chicago, Illinois, also became major vacation draws in that same period.[6]

These above attractions have remained popular destinations across the Great Lakes. These destinations continue to attract tens of thousands of visitors a year, and while the Great Lakes commercial fishing industry is now a ghost of its former self, recreational fishing has become a multi-billion dollar industry.[7] In terms of revenue, Great Lakes-wide income generated from tourism has grown steadily. For example, revenue generated from Great Lakes tourism has grown year-on-year since 2009.[8] A snapshot of the industry gathered in 2015 showed that Great Lakes tourism generated $492 million (U.S.) in revenue. Further studies project that, by 2020, revenue derived from the Great Lakes tourism industry will increase to roughly $632 million (U.S.).[9]

The current strength and continued growth in Great Lakes tourism presents growth opportunities for the commercial cruise industry as well. In fact, there is already a limited but robust flow of visitors through the Great Lakes' more than 100 ports and commercial docks.[10] In 2018, for example, Great Lakes waterways saw nearly 100,000 port visits by passengers.[11] In response, industry, NGO, and trade groups including the Great Lakes Seaway Partnership, the Conference of Great Lakes and St. Lawrence Governors and Premiers, and the Research and Traffic Group have also shown interest in exploring the future of Great Lakes commercial cruising. Recent reports show that industry groups consider the Great Lakes commercial cruise market to have a viable future and that there is market interest from consumers.[12]

More specifically, several developments indicate that industry groups are moving to capitalize on these opportunities. For example, industry stakeholders recently formed a consortium titled Cruise the Great Lakes in 2018 with the specific goal of creating "a new international partnership aimed at bringing more cruise passengers to the region."[13] This partnership seeks to increase the overall economic impact of Great Lakes cruising, by marketing not only to passengers, but also to potential tour operators.[14] This effort is underpinned by the realization that cruises on the Great Lakes of the United States and Canada are increasing in

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[6] *See Cedar Point*, Ohio History Connection, http://www.ohiohistorycentral.org/w/Cedar_Point (last visited May 18, 2019).

[7] *See* The Great Lakes Fishery: a World Class Resource, GREAT LAKES FISHERY COMMISSION, http://www.glfc.org/the-fishery.

[8] *Revenue of coastal and Great Lakes passenger transportation (NAICS 483114) in United States from 2009 to 2020* (in million U.S. dollars), STATISTA, https://www.statista.com/forecasts/409670/united-states-coastal-and-great-lakes-passenger-transportation-revenue-forecast-naics-483114 (last visited Mar. 30, 2019).

[9] *Id.*

[10] DAVID C. HACKSTON & GORDON ENGLISH, ENVIRONMENTAL AND SOCIAL IMPACTS OF MARINE TRANSPORT 2 (Research and Traffic Group, 2013), https://lakeerie.ohio.gov/Portals/0/GLRI/Environmental%20and%20Social%20Impacts%20Study.PDF.

[11] *Id.*

[12] Craig Clark, *Cruise the Great Lakes – Great Lakes St. Lawrence Governors & Premiers Launch Cruise the Great Lakes*, GLOBE NEWSWIRE (Aug. 30, 2018), https://www.globenewswire.com/news-release/2018/08/30/1563727/0/en/Great-Lakes-St-Lawrence-Governors-Premiers-Launch-Cruise-the-Great-Lakes.html.

[13] *Id.*

[14] *Id.*

popularity due to their easy access and lower costs associated when compared to other cruises.[15]

As such, major cruise operators are gearing up for expansion in the Great Lakes region, with European cruise line expected to enter the Great Lakes market in the 2019-2020 season. Specifically, French luxury cruise line Ponant is engaging in the Great Lakes area with new services.[16] German Hapag-Lloyd Cruises will be joining the venture as well.[17] Local and regional press have also reported that major cruise lines, including Viking Cruises, may be considering expansion into the Great Lakes for the first time.[18] Finally, major destinations are also working to ensure that they are competitive draws for the cruise market. For example, the Detroit/Wayne County Port Authority recently spent $21.5 million improving its port for security and to make it more appealing to cruises and tourists.[19]

III. Related Great Lakes Industries: Manufacturing and Shipping

The Great Lakes, as an overall economic unit, is one of the most productive on the planet. In 2015, the region accounted for nearly a third—30% in economic activity and 31% in employment—of combined Canadian and U.S. output, jobs and exports.[20] The total economic output (from both the Canadian and U.S. side) was estimated at $5.8 trillion (U.S.).[21] That number has now increased to over $6 trillion (U.S.) since 2017.[22] The two top trade exports in the Great Lakes Region have consistently been transportation equipment and machinery, with agricultural and food products, metals and chemicals playing secondary, but still prominent, roles.[23] Regarding cross-border trade between the U.S. and Canada, the region's trade linkages accounted for $235 billion of total trade in 2015.[24]

Regarding the shipping industry, the Great Lakes-St. Lawrence Seaway shipping industry, "supports 227,000 jobs, produces $35 billion of business revenue, and adds nearly $5 billion per year to federal, state and provincial revenues."[25] More than 160 million metric tons of manufactured products,

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[15] Lori Rackl, *The next cruising hot spot is closer than you think: Get ready for more ships on the Great Lakes*, CHI. TRIB., Apr. 2, 2019, https://www.chicagotribune.com/travel/sc-trav-great-lakes-cruises-0409-story.html.

[16] *Id*.

[17] *Id.*

[18] *Id.*

[19] Jonathan Oosting, *Cruise ship brings tourists to Detroit as officials tout economic potential of new $21.5M port*, MLIVE MEDIA GROUP (Jul. 19, 2011), https://www.mlive.com/news/detroit/2011/07/cruise_ship_brings_tourists_to.html.

[20] *Id.* at 3.

[21] *Id.*

[22] Martin Associates, *Economic Impacts of Maritime Shipping in the Great Lakes – St. Lawrence Region Executive Summary*, 2 (2018), http://greatlakesseaway.org/downloads/2018-glsls-executive-summary-en-hr.pdf.

[23] *Id.* at 7.

[24] *Id.*

[25] Robert Kavcic, *Connecting Across Borders: A Special Report on the Great Lakes and St. Lawrence Regional Economy*, BMO CAPITAL MARKETS, 7 (2016), https://www.gsgp.org/media/1818/2016-cglslgp-bmo-economic-report.pdf.

agricultural commodities, and raw material are moved on the Seaway annually.[26] In 2017 specifically, cargo transporting across the Seaway totaled 143.5 million metric tons valued at $15.2 billion U.S. dollars.[27] The commerce generated from this cargo transport supported 237,868 jobs and $35 billion U.S. dollars in economic activity.[28] The wages and salaries accumulated from these 237,868 jobs amounted to around $14.2 billion.[29]

The most common cargoes "include iron ore for steel production, coal for power generation, limestone and cement for construction, and grain for both domestic consumption and export."[30] The Seaway also provides a link between North America and more than 59 overseas markets.[31] Because of these benefits, ramping up on the Seaway's infrastructure will surpass $1.1 billion through 2018 thanks to a combination of public- and private-sector investments.[32] Clearly, the economic engine and infrastructure exists to support the growth of a Great Lakes cruise industry.

IV. Looking Ahead: General Economic Indicators

If the economic trends continue at the pace set in 2015, increased job and production opportunities will prevail across the Region. Real GDP expanded at a rate of 2.1% in 2015, "marking a second straight year of accelerating growth."[33] However, there has been a shift in the prominence of specific industries within the Regional market: manufacturing employment took a 17% decrease hit compared to a decade ago, while education, healthcare and professional services have increased between 17% and 21%.[34] This shift from high-productivity industries to service sector industries implies less use of shipments and exports on the Great Lakes in the future.

On the other hand, some recent reports indicate advantages to Seaway transport rather than land transport in the Region. First, there are fuel-efficiency benefits: Seaway transport can move its cargo 14% farther (or 14% more fuel-efficiently) than rail and 594% farther (or 594% more efficiently) than trucks.[35] Second, there are environmental concerns: compared to Seaway transports carrying one ton of cargo one kilometer, rail would emit 19% more greenhouse gas, and the truck mode would emit 533% more greenhouse gas than marine.[36] Finally, in regards to efficiency, the largest Seaway vessels "typically 1,000 feet in length, can carry 62,000 tons of cargo — equivalent to 2,340 trucks or 564 rail cars."[37]

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[26] HACKSTON, *supra* note 9, at 2.
[27] Martin Associates, *supra* note 21, at 6.
[28] *Id.*
[29] *Id.*
[30] HACKSTON, *supra* note 9, at 2.
[31] *Id.*
[32] Kavic, *supra* note 24, at 7.
[33] *Id.* at 3.
[34] *Id.*
[35] HACKSTON, *supra* note 9 at 6.
[36] *Id.* at 8.
[37] *Id.* at 12.

The concentration of manufacturing jobs in the Great Lakes Region is much higher than the American average (as of 2017).[38] However, there are fewer jobs in the leisure and hospitality industry, resulting in a lower average in the Great Lakes than the U.S. overall. Interestingly, manufacturing jobs in the Great Lakes region are only 1% higher than jobs in the leisure and hospitality industry.[39] In other words, when looking at only Great Lakes regional employment, manufacturing jobs make up 11% of the total jobs, while leisure and hospitality jobs make up 10%.[40] This data indicates that there is a lower percentage of leisure and hospitality jobs in the Great Lakes when looking at the labor force as a whole, and shows there is room for growth.

V. Possible Impediments to Growth

However, any projected growth in the Great Lakes commercial cruise industry is not without cost. Cruise line operators must comply with a plethora of regulatory obligations in order to gain market entry and maintain operations.Other regulations govern port operations vis-à-vis passenger cruises, often with associated costs in compliance measures and improved physical infrastructure. This project will closely examine the regulatory regimes for the major aspects of commercial cruising, including pilotage, safety and security, and cabotage in order to provide working information for industry stakeholders and other interested parties.

Image 1: The Great Lakes – St. Lawrence Maritime Transport System[41]

[38] Jeff Desjardins, *The Great Lakes Economy: The Growth Engine of North America*, VISUAL CAPITALIST (Aug. 16, 2017), https://www.visualcapitalist.com/great-lakes-economy/.

[39] *Id.*

[40] *Id.*

[41] PORT OF MONROE, *The Great Lakes Network*, https://portofmonroe.com/solutions/great-lakes-network/.

PILOTAGE AND GREAT LAKES COMMERCIAL CRUISE NAVIGATION

VI. Defining Pilotage

Pilotage is "one of the principal subdivisions of navigation—the science and art of directing the movements of a vessel from one position to another in a safe and efficient manner."[42] In essence, pilotage, or piloting, is "the use of landmarks, aids to navigation, and soundings to conduct a vessel safely through channels and harbors, and along coasts where depths of water and danger to navigation require constant attention to the boat's position and course."[43] In this context, the United States and Canada already have an established pilotage relationship necessitated by their shared use of the Great Lakes and St. Lawrence Seaway.

As a result of decades of cooperation on operational and regulatory matters, the two countries' pilotage schemes have converged in the areas of pilotage licensing and reciprocity, efforts to coordinate pilotage fees, and exceptions to pilotage requirements for inter-lake commercial travel. Currently, the strongest areas of cooperation exist where both countries have established statute-based alignment in pilotage regulation. In other areas, the two national pilotage systems retain regulatory discrepancies that impose differing compliance burdens on Great Lakes operators and will likely need innovation in order to support growth in a Great Lakes commercial cruise industry. While neither country is likely to sacrifice the autonomy of its individual regulatory systems, by expanding statute-based reciprocity and developing either joint or parallel systems, both countries would be able to benefit from a more seamlessly organized Great Lakes cruise industry.

VII. Current Regulatory Framework for Pilotage on the Great Lakes

In the U.S., Great Lakes pilotage is governed by Chapter 93 of Title 46, titled Great Lakes Pilotage.[44] The Canadian equivalent is the Pilotage Act, enacted in 1972.[45] While the Canadian Pilotage Act delegates powers to regulate Great Lakes pilotage to a series of local authorities, the US Great Lakes Pilotage statute reserves authority to the federal government through the USDOT, which subsequently delegated this responsibility to the USCG.[46]

A pilot is defined as "any person who does not belong to a ship and who has the conduct of it."[47] Furthermore, the concept of compulsory pilotage is defined as, "in respect of a ship, the requirement that the ship be under the conduct of a licensed pilot or the holder of a pilotage certificate."[48] One of the main tenants of

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[42] ELBERT S. MALONEY, *Chapter 16: Basic Piloting Procedures*, *in* CHAPMAN PILOTING AND SEAMANSHIP 556 (64th ed. 2003).

[43] *Id.*

[44] *Id.*, at 249, citing 46 U.S.C.A. § 9302 (West 1996).

[45] *Id.*, citing CANADIAN MARITIME LAW 730 (Aldo Chircop et al. eds., Irwin Press 2nd ed. 2016).

[46] *Id.* at 250, citing Paul G. Kirchner et al, *Unique Institutions, Indispensable Cogs, and Hoary Figures: Understanding Pilotage Regulation in the United States*, USF MARITIME LAW JOURNAL, Vol. 23 No. 1 (San Francisco)

[47] *Id.*, citing *Pilotage Act*, RSC 1985, c P-14, s 1.1 [hereinafter *Pilotage Act*].

[48] *Id.*, citing *Pilotage Act* s 2.

the pilotage regulations is the creation of compulsory pilotage districts – however, not all ports and harbors require pilotage, and even in compulsory pilotage areas, certain classes of vessels may be exempt.[49]

In the United States, Great Lakes pilots are required on "each vessel of the United States operating on register and each foreign vessel."[50] On waters designated by the President of the United States under §9302(a)(2), pilots "direct the navigation of the vessel subject to the customary authority of the master."[51] In all other waters, pilots are required to be on board and be available to direct the navigation of the vessel subject to the authority of the master.[52] Vessels may operate without a pilot only if: "(1) the master is notified that no registered pilot is available; or (2) the vessel or its cargo is in distress or jeopardy."[53] However, a "documented vessel" which operates regularly between the Great Lakes and St. Lawrence River is not required to obtain a pilot under §9302(a)(1).[54] Members of the complement of US registered vessels and Canadian vessels may serve as a pilot in all waters not designated under §9302(a)(2), if they are licensed to so do under §7101 of this title or equivalent Canadian law.[55] Pilotage reciprocity with Canada will continue until Canada stops granting reciprocity for US pilots.[56]

In the U.S., the Great Lakes – St. Lawrence System is divided into three pilotage districts. District 1 encompasses the Saint Lawrence Seaway and Lake Ontario, and is regulated by the Saint Lawrence Seaway Pilots Association.[57] District 2 encompasses the area from Lake Erie through the St. Clair Rivers, and is governed by the Lake Pilots Association.[58] District 3 encompasses Lakes Superior, Michigan, and Huron, as well as the St. Mary's River and the Soo Locks, and is governed by the Western Great Lakes Pilots Association.[59] States may not regulate pilots on the Great Lakes.[60] The Secretary of Transportation has established the Great Lakes Pilotage Advisory Committee to review and make recommendations on potential pilotage regulations.[61]

46 U.S.C. § 9302(a)(2) delegates Great Lakes pilotage authority to the President, and executive rule making has established as follows:

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[49] *Id*.
[50] *Id*., citing 46 U.S.C.A. § 9302(a)(1) (West 1996).
[51] *Id*., citing 46 U.S.C.A. § 9302(a)(1)(A) (West 1996).
[52] *Id*., citing 46 U.S.C.A. § 9302(a)(1)(B) (West 1996).
[53] *Id*., citing 46 U.S.C.A. § 9302(d) (West 1996).
[54] *Id*., citing 46 U.S.C.A. § 9302(e) (West 1996).
[55] *Id*., citing 46 U.S.C.A. § 9302(b) (West 1996).
[56] *Id*., citing 46 U.S.C.A. § 9302(c) (West 1996).
[57] *Id*., citing *Our Mission*, St Lawrence Seaway Pilots Assoc., http://seawaypilots.com/?page_id=7.
[58] *Id*., citing *About Us*, Lakes Pilots Association, Inc., http://www.lakespilots.com/.
[59] *Id*., citing *About Us*, Western Great Lakes Pilots Association, http://www.wglpa.com/about-us/.
[60] *Id*., citing 46 U.S.C.A. § 9306 (West 1996).
[61] *Id*., citing 46 U.S.C.A. § 9307 (West 1996).

Table 1: US Great Lakes-St. Lawrence Pilotage Districts[62]

DISTRICT	REGULATION	REQUIREMENT
District 1	Pilots required to be used on "all waters of the St. Lawrence River between the international boundary at St. Regis and a line at the head of the river running between Carruthers Point Light and South Side Light extended to the New York Shore."	Regulation requires licensed pilots to navigate vessels between the easternmost U.S. boundary in the St. Lawrence River, which begins near St. Regis, and where the St. Lawrence River opens into Lake Ontario, just south of Kingston.
District 2	Pilots required in all areas west of "Lake Erie [from one mile east] of … Sandusky Pierhead Light at Cedar Point to Southeast Shoal Light… [through the] St. Clair River."	Regulation requires licensed pilots to navigate vessels from just east of Sandusky through the mouth of Lake Huron.
District 3	Pilots required in all "waters of the St. Mary's River [and] Sault Sainte Marie Locks."	Regulation requires licensed pilots to navigate vessels from the end of Lake Huron through the beginning of Lake Superior.

In Canada, two local authorities established under the Pilotage Act regulate pilotage on the MTS.[63] The Laurentian Pilotage Authority is responsible for "all Canadian waters in and around the Province of Quebec, north of the northern entrance to St. Lambert Lock, except the waters of Chaleur Bay, south of Cap d'Espoir in latitude 48 degrees 25 minutes 08 seconds N., longitude 64 degrees 19 minutes 06 seconds W."[64] The Great Lakes Pilotage Authority is responsible for "all Canadian waters in the Province of Quebec, south of the northern entrance to St. Lambert Lock," as well as, "all Canadian waters in and around the Provinces of Ontario and Manitoba."[65]

The Great Lakes Pilotage Authority administers the compulsory pilotage areas within its boundaries, and determines what vessels must comply with its directives.[66] The compulsory pilotage areas, under the Great Lakes Pilotage Authority, are as follows: Cornwall District, International District 1, International District 2, International District 3, the Canadian waters of Lakes Ontario, Erie, Huron and Superior, as well as the navigable waters within the limits of the Port of Churchill, Manitoba.[67] Ships are subject to compulsory pilotage in these areas if they total more than 1500 gross tonnage, are not registered in Canada, and are over 35 m in length.[68] Ferries and tugboats are subject to different rules. Ferries that operate on a regular schedule are generally not required to use a pilot.[69]

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[62] *Id*., at 251 citing Proc. No. 3385, Designation of Restricted Waters, (codified as amended at 46 USC § 9302).

[63] *Id.*

[64] *Id*., citing *Pilotage Act*, *supra* note 47.

[65] *Id*., citing *Id.*

[66] *Id.*

[67] *Id*., citing *Great Lakes Pilotage Regulations*, CRC, c 1266, s 3 [hereinafter *GLP Regulations*].

[68] *Id*., citing *GLP Regulations* s 4.

[69] *Id*., citing *GLP Regulations* s 4.1.

Tugboats, even if smaller in size and tonnage than specified in the general rule, may be required to use a pilot depending on the type of ship being towed or pushed.[70]

The Laurentian Pilotage Authority establishes the following as compulsory pilotage areas: all the navigable waters of the St. Lawrence River between the northern entrance to St. Lambert Lock and a line drawn across the river approximately at latitude 48°N, longitude 69°W; all the navigable waters lying within the limits of any harbor situated within the area previously referred to; and all the navigable waters of the Saguenay River to the western limits of Baie des Ha! Ha!, and the Harbor of Chicoutimi.[71] These designated areas are further divided into different districts (i.e. District 1, District 1.1, and District 2) which are sometimes subject to different vessel qualifications.[72] Ships registered in Canada will generally require pilotage if they are over 70 m in length and 2400 gross tonnage (Districts 1, and 1.1); or over 80 m in length and 3300 gross tonnage (District 2).[73] On the other hand, ships that are not registered in Canada will require pilotage if they are over 35 m in length.[74] US pilots are recognized to some extent in Canadian legislation. The Great Lakes Pilotage Authority provides that where Canadian waters are contiguous with the waters of the United States, a ship subject to compulsory pilotage is permitted to be under the conduct of a pilot duly licensed by the appropriate US authority.[75] The Laurentian Pilotage Authority has not created an equivalent Canadian provision for U.S. vessels.[76]

The St Lawrence Seaway requires alternate procedures for foreign-flagged vessels.[77] A "notice-of-arrival" must be submitted to the Marine Communications and Traffic Service in Halifax, Nova Scotia, 96 hours before entering North American waters.[78] Once the vessel has entered the Seaway system, it must employ a licensed Canadian pilot during its travel through the boundaries of the Laurentian Pilotage Authority.[79] This area, extending approximately from Halifax to Montreal, is subject to compulsory pilotage under the Laurentian Pilotage Regulations, and specifies that the pilot must be accredited in Canada.[80]

Moving past the Montreal region, the vessel then moves into the boundaries of the Great Lakes Pilotage Authority, which extend to Duluth, Minnesota at the western end of Lake Superior.[81] This also marks the beginning of shared waters between Canada and the United States.[82] At this point, the vessel has the choice of

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[70] *Id*., citing *GLP Regulations* ss 4.2-4.3.
[71] *Id*., at 252 citing *Laurentian Pilotage Authority Regulations*, CRC, c 1268 Schedule I.
[72] *Id*., citing *Laurentian Pilotage Authority Regulations* Schedule II.
[73] *Id*., citing *Laurentian Pilotage Authority Regulations* s 4(1)(a).
[74] *Id*., citing *Laurentian Pilotage Authority Regulations* s 4(1)(b).
[75] *Id*., citing *GLP Regulations*, *supra* note 37 s 6.
[76] *Id*.
[77] *Id*.
[78] *Id*., citing William Baumgartner & John Oliver, *Conditions of Entry of Foreign-Flag Vessels into US Ports to Promote Maritime Security,* 84:1 INTL. L. STUDIES. SERIES 4, 49 (2008).
[79] *Id*.
[80] *Id*.
[81] *Id*.
[82] *Id*.

engaging either an American or a Canadian pilot.[83] If the vessel chooses to use a US pilot, they will have to employ three different pilots as the ship travels through the boundaries of the three associations that manage pilotage along the route to Duluth.[84] It may be simpler to use a Canadian pilot if travelling the full length of the waterway, to avoid switching between pilots frequently, considering there is only one authority regulating pilotage for the remaining length of the voyage.[85]

Overall, pilotage requirements are complex – spread across the two national sets of requirements and multiple pilot authorities and districts. This complexity creates an impediment to new users and, regardless, higher costs for all users as compared to a more streamlined system.[86]

VIII. Regulating Coordination between the U.S. and Canada on Pilotage

Under current regulations, both the United States and Canada have legislatively mandated reciprocal policy allowing each countries' pilots to operate in their respective waters. 46 U.S.C. § 9302(c) provides that:

> The authority extended under subsections (a) and (b) of this section to a Canadian registered pilot or other Canadian licensed officer to serve on certain vessels in United States waters of the Great Lakes shall continue as long as Canada extends reciprocity to United States registered pilots and other individuals licensed by the United States for pilotage service in Canadian waters of the Great Lakes.[87]

This reciprocity statute is mirrored by language in the Canadian Great Lakes Pilotage Regulations, ensuring that both statutes remain in effect.[88] Great Lakes Pilotage Regulations, SOR/2007-95, read in pertinent part:

> (1) Subject to subsection (2), where Canadian waters are contiguous with waters of the United States, a ship subject to compulsory pilotage may be under the conduct of a person who is duly authorized to have such conduct by an appropriate authority of the United States.
>
> (2) Subsection (1) does not apply unless persons holding licences or pilotage certificates under the Act and any regulations made pursuant to the Act are granted similar authority by the Government of the United States for the United States waters of the Great Lakes, their connecting and tributary waters and the St. Lawrence River as far east as St. Regis in the Province of Quebec.[89]

These statutes provide a substantial basis of coordination between the United States and Canada, and prevent either country from having to modify their pilot

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[83] *Id.*
[84] *Id.*
[85] *Id.* at 252.
[86] *Id.*
[87] 46 U.S.C. § 9302(c) (2018).
[88] Great Lakes Pilotage Regulations, SOR/2007-95 (Can.).
[89] *Id.*

licensing requirements to remain in compliance when entering the other's waters.

Canada and the United States Coast Guard have also produced two detailed "Memorandums of Understanding" – agreements stipulating areas of coordination and cooperation on Great Lakes policy and practice.[90] In 2002, the United States Coast Guard and Transport Canada issued the memorandum of understanding "Respecting Mutual Recognition of Domestic Mariner Qualifications."[91] This memorandum allows for the recognition of the regulatory hours of rest as well as personal certifications mandated by the U.S. and Canada in an effort to avoid violations during ship inspections that might hamper trade and travel between the two countries.

A further 2013 memorandum between the United States Coast Guard and the Canadian Great Lakes Pilotage Authority specifically addresses pilotage concerns.[92] The memorandum establishes a coordinated pilotage service between the United States and Canada, which created a register of authorized pilots, simplifying maritime operations between the two countries. The memorandum also arranges for cost sharing for facilities and/or services jointly provided by the countries for pilotage purposes. In addition, the memorandum establishes a pilot assignment system for all ships entering the Great Lakes that requires alternate assignments between Canadian and U.S. pilots.[93] As a part of this alternating system, the memorandum announced the intent to arrange for the establishment of regulations that impose "comparable rates and charges" based on the size and weight of the instant vessel.[94]

Since these joint efforts are already taking place, the possibility that the two countries would fail to meet a coordinated agreement is unlikely. Some of the issues with predictability on matters like pilotage fees, for example, arise from the differences between pilotage fees imposed on and by U.S. and Canadian pilots. Because the 2013 Memorandum of Understanding is a voluntary agreement that only dictates an intent to work towards consistency on issues like more

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[90] Although there are technically more than two Memorandums of Understanding on Great Lakes issues, the 2002 and 2013 memorandums are the only memorandums with a material effect on pilotage in the Great Lakes and Great Lakes maritime issues for these purposes. Other unrelated examples include the *Memorandum of Understanding for Approval of Personal Lifesaving Appliances*, stipulating joint efforts to regulate testing of new life-saving devices like life boats or life jackets for commercial vessels, and the *Memorandum of Understanding Between the United States Coast Guard Auxiliary and the Canadian Coast Guard Auxiliary*, coordinating efforts between the U.S. volunteer agency and the Canadian non-profit on issues of boating safety.

[91] MARINE SAFETY, TRANSPORT CAN., MEMORANDUM OF UNDERSTANDING BETWEEN THE U.S. COAST GUARD AND TRANSPORT CAN. RESPECTING MUTUAL RECOGNITION OF DOMESTIC MARINER QUALIFICATIONS (2002).

[92] U.S. COAST GUARD, MEMORANDUM OF UNDERSTANDING GREAT LAKES PILOTAGE BETWEEN THE UNITED STATES COAST GUARD AND THE GREAT LAKES PILOTAGE AUTHORITY, (2013).

[93] *Id.* There are some exceptions to this system of alternating pilots. Canada exclusively services the Welland Canal, and in District 3 waters (all of the waters of Lake Huron north of Latitude 43° 05' 30"N, Lake Michigan and Lake Superior, and the St. Mary's River) Canadian pilots are only to be assigned as often as to receive 18.9% of the total revenue of the district for the season.

[94] *Id.*

homogenous fees and other maritime regulations, there is no long-term guarantee that these memorandums will serve as effective influences on U.S. or Canadian policy. Cementing the terms of these memorandums in respective statutes would ensure long-term predictability in Great Lakes pilotage regulation, and the industry would not be subject to the risk of changing priorities in each country's respective pilotage agencies.

IX. Pilotage Fees and Requirements: Inconsistent Rules and Implementation

While the general Canada-U.S. paradigm for licensing and allocating pilotage has significant levels of convergence, pilotage regulations retain areas of divergence and ambiguity, particularly regarding fees and pilotage requirements for certain ship classes. While the 2013 Memorandum of Understanding detailed above calls for coordination on pilotage fees, United States pilotage fees remain considerably higher than Canadian fees, and are continuing to increase.[95] The United States calculates and updates their pilotage charges annually in accordance with the Great Lakes Pilotage Regulations, establishing an hourly pilotage rate for different districts on the Great Lakes. The Canadian Authority does so in yearly updated Regulations under the authority of the Pilotage Act, typically basing its rate on tonnage shipped and distance travelled.[96] Given that the U.S. rates are localized and based on a number of factors, and the Canadian rates are more standardized based on tonnage and distance, there can be considerable variation in pilotage fees depending on a ship's itinerary and ports of call.

Currently, the cost associated with pilot services on the Great Lakes are subject to varying rates from corporations and fees from each country's governing bodies. The American Great Lakes Ports Association, who represents commercial ports and port users, brought a lawsuit against the United States Coast Guard after pilot firms, who provide pilots to the Great Lakes, increased their rates. In the case, the nonprofit association challenged the Coast Guard's new rules that allowed for a 10% increase in pilot fees for international shippers.[97] While this case is pending appeal, the District Court's decision found that the U.S. Coast Guard had acted "arbitrarily and capriciously" in deciding on the above rate increase and in choosing a specific weighting factor in its rate calculations.[98] While the Court did find that the U.S. Coast Guard did act improperly, the court stopped short of instituting a judicial remedy regarding rates. So, there remains some uncertainty in the near term about possible pilotage rates at U.S. ports in the Great Lakes.

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[95] *See* John C. Martin Associates, *Analysis of Great Lakes Pilotage Costs on Great Lakes Shipping and the Potential Impact of Increases in U.S. Pilotage Charges* (2017), https://www.greatlakesports.org/wp-content/uploads/2017/09/Analysis-of-Great-Lakes-Pilotage-Costs.pdf.

[96] *See Great Lakes Pilotage Rates – 2019 Annual Review and Revisions to Methodology* (Oct. 17, 2018), https://www.federalregister.gov/documents/2018/10/17/2018-22513/great-lakes-pilotage-rates-2019-annual-review-and-revisions-to-methodology (U.S.); *Regulations Amending the Great Lakes Pilotage Tariff Regulations* (Dec. 15, 2018), http://gazette.gc.ca/rp-pr/p1/2018/2018-12-15/html/reg4-eng.html (Canada), respectively.

[97] *Am. Great Lakes Ports Ass'n v. Zukunft*, 296 F. Supp. 3d 27, 45 (D.D.C. 2017), case currently pending appeal.

[98] *Id.* at 56.

In another forum, some pilots have complained and legally challenged the U.S. Coast Guard's low rates. The Lakes Pilot Association claimed that, as the result of low rates, there was a lack of funding for pilot training and a large number of pilots leaving the Great Lakes to work in other waters around the U.S. and even abroad.[99] These issues raised concerns from a different perspective for the Great Lakes pilotage authority in Canada. As recently as 2016, the Director of Great Lakes Pilotage, Todd Haviland, was quoted as saying, "[w]e don't want to scare those crew ships out of the Great Lakes because of exorbitant pilotage fees."[100] In sum, the uncertainty surrounding pilotage rates and fees presents a major headache for commercial vessel operators on the Great Lakes. In order to aid a fledgling commercial cruise industry on the Great Lakes, it would behoove the U.S. and Canada to (1) resolve existing uncertainty with fees and rates, and (2) harmonize those regulations.

Another area where commercial cruise operators may encounter regulatory uncertainty is in determining when pilots are required for commercial cruise navigation on the Great Lakes. Under U.S. law, pilots are specifically required on "each vessel of the United States operating on register and each foreign vessel."[101] However, there is an exception to this general pilotage requirement, in that, "documented vessels" that operate regularly on the Great Lakes and St. Lawrence River are not required to obtain a pilot under §9302(a)(1).[102] Pilots on the Great Lakes are, however, required on all ocean-going ships.[103] In Canada, location, size of a vessel, and weight of cargo all play a factor in whether pilots are required, but any cruise ship would likely be subject to compulsory pilotage based on its size and weight alone.[104] However, Canada has waived compulsory pilotage in cases where vessels only navigate the Great Lakes and are under the conduct of a master officer or deck watch officer that has a certificate of competency issued by the United States.[105] This means that although Canada does not have its own exception for vessels that constrain themselves to Great Lakes travel, they effectively recognize the U.S. exception allowing as much.

Based on the above piloting requirements, cruise ships may be able to operate on the Great Lakes without a certified pilot if those vessels were limited in range to the Great Lakes, have a certificate of documentation, and are overseen by a master or deck watch officer certified by the U.S.[106] However, it is unclear if cruise

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[99] Stephen Kloosternan, *Higher Pilot Fees unpopular on the Great Lakes from freighters to Viking boat*, https://www.mlive.com/news/muskegon/2017/01/higher_pilot_fees_unpopular_on.html (last visited Mar. 21, 2019).

[100] Richard D. Stewart, *Regulations and Policies that Limit the Growth of the U.S. Great Lakes Cruising Market,* NAT'L CTR FOR FREIGHT & INFR. RES. & ED. (Apr. 4, 2019, 9:28 PM), http://www.wistrans.org/cfire/documents/FinalPaper_CFIRE0221.pdf.

[101] 46 U.S.C.A. §9302(a)(1) (West 1996).

[102] 46 U.S.C.A. §9302(e) (West 1996). *See* 46 U.S.C.A. § 12103 (detailing what constitutes a "documented ship", i.e. any U.S. flag vessel of 5 or more tons).

[103] *Great Lakes Marine Pilotage,* AM. GREAT LAKES PORTS ASS'N, http://www.greatlakesports.org/issues/short-sea-shipping/ (last visited Mar. 24, 2019).

[104] *Id.*

[105] Great Lakes Pilotage Regulations, SOR/2011-136 (Can.).

[106] 46 U.S.C.A. §9302(e)-(f) (West 1996).

ships that travel internationally would be able to operate under a similar arrangement, and would likely have to request an American or Canadian pilot to travel in the Great Lakes Region in order to operate without concern over regulatory discrepancies. As with pilotage fees, piloting requirements remain an area where a harmonized approach would aid commercial cruise operators in complying with the bi-national regulatory requirements.

X. Pending Regulatory and Oversight Changes

Pilotage on the Great Lakes is monitored by three pilotage agencies: (1) the Office of Great Lakes Pilotage, a U.S. agency that regulates the three U.S. Great Lakes pilot associations; (2) the Great Lakes Pilotage Authority, a Government of Canada non-agent Crown corporation established pursuant to the Pilotage Act that is the sole administer of pilotage regulation on Canadian waters; and (3) the Laurentian Pilotage Association, which specifically covers pilotage on the Saint Laurence River.[107] Together, these agencies regulate and mandate requirements on pilotage for their respective national waters as well as portions of the Great Lakes that are shared between both Canada and the U.S. These organizations also collectively provide all of the available pilots for travel on the Great Lakes.

One concern on the horizon with coordinated pilotage requirements is that recent reviews of Canada's Pilotage Act are suggesting a major change in the country's Pilotage Authorities.[108] The 2018 review proposed 38 recommendations to modernize the Pilotage Act including a complete amalgamation of the four existing Pilotage Authorities: the Atlantic Pilotage Authority, the Great Lakes Pilotage Authority, the Laurentian Pilotage Authority, and the Pacific Pilotage Authority.[109] The review also suggested eliminating the Authorities and creating a single not-for-profit pilotage corporation based on other existing models.[110] The implementation of these changes could have an impact on U.S.-Canada relations, which could create unpredictability for a newly established Great Lakes Cruise system. Fortunately, the review encourages more cooperation with the United States, although in vague terms. Like Canada, organizations in the United States have also proposed changes to the governance of the United States Pilotages Services in the Great Lakes.[111] As of the writing of this report, these discussions have not materialized into concrete legislation in either Canada or the U.S.

SAFETY & SECURITY AND GREAT LAKES COMMERCIAL CRUISING

XI. Current Regulatory Framework for Safety and Security

On Great Lakes waters under U.S. jurisdiction, the U.S. Coast Guard has primary jurisdiction over all aspects of safety and security for both commercial

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[107] *Analysis of Great Lakes Pilotage Costs*, supra note 95.

[108] Transport Can., *Pilotage Act Review Final Report*, DEP'T OF TRANSPORT, (Apr. 30, 2018), https://www.tc.gc.ca/documents/17308_TC_Pilotage_Act_Review_v8_final.pdf.

[109] *Id.*

[110] *Id.*

[111] See *Joint Letter to Congress* (July 10, 2018), http://www.gsgp.org/media/2085/coalition-pilotage-letter-7-10-18.pdf.

and private watercraft. Specifically, the U.S. Coast Guard's 9th District is responsible for all waters of the Great Lakes and St. Lawrence Seaway. Based in their general congressional authorizations, the U.S. Coast Guard, U.S. Department of Transportation, and St. Lawrence Seaway Development Corporation (SLSDC) have shared rule-making authority for safety and security regulations in the Great Lakes – St. Lawrence system. The U.S. Coast Guard then has primary enforcement responsibility for the rules and regulations promulgated by each agency.[112] While outside the scope of this project, the Federal Maritime Commission also has ancillary jurisdiction over commercial cruising in the U.S., particularly in areas of consumer protection and casualty insurance.[113]

On Great Lakes waters under Canadian jurisdiction, a similar framework exists. The Canadian Coast Guard has primary jurisdiction over all aspects of safety and security for both commercial and private watercraft, with shared rule-making authority with Transport Canada and the St. Lawrence Seaway Management Corporation (SLSMC). Safety and security in the commercial cruise industry implicates several interrelated operational areas, including fire safety of a vessel, passenger safety, and passenger screening.

A. Passenger Screening

Passenger screening, much like with air travel, is a primary means of ensuring safety and security on cruise ships, as well as ensuring adequate protections against entry of unauthorized persons at ports of entry. Most passenger screening activities occur at cruise ship terminals, facilities at various ports that function much the same way as commercial airport facilities operate for air travelers. In 2019, the U.S. government streamlined regulations for cruise ship terminals into the Terminal Screening Program (TSP). [114] The TSP dictates the requirements for cruise ship terminals in the United States. Under this regulation, terminals must, "…ensure all persons, baggage, and personal effects are screened at the cruise ship terminal prior to being allowed into a cruise ship terminal's secure areas or onto a cruise ship."[115] The TSP also provided an updated Prohibited Items List (PIL) that more closely mirrors TSA's prohibited items for air travel. The TSP also requires that all cruise terminal operators document both their procedures for passenger screening, as well as the results of screening each individual passenger.[116] The U.S. Coast Guard has primary responsibility for enforcing these regulations.

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[112] U.S. Coast Guard, "Ninth Coast Guard District Units" (11 January 2017), *US Department of Homeland Security*, https://www.uscg.mil/d9/units.asp. *See also*, *Cruise Industry Oversight: Recent Incidents Show Need for Stronger Focus on Consumer Protection: Hearing on S. Comm on Commerce, Science, and Transportation*, 113th Cong. 1 (2013) (statement of Rear Admiral Joseph Servidio, U.S. Coast Guard Assistant Commandant for Prevention Policy), https://www.dhs.gov/news/2013/07/24/written-testimony-uscg-senate-committee-commerce-science-and-transportation-hearing.

[113] *See generally* Federal Maritime Commission, *About Us*, https://www.fmc.gov/about-the-fmc/.

[114] *See generally* 46 C.F.R. §§ 70.1-1—80.40 (2010). *See also* Consolidated Cruise Ship Security Regulations, 83 Fed. Reg. 53, 12086-12104 (April 18, 2018) (providing guidance on the updated regulations contained in 33 C.F.R. §§ 101, 104, 105, 120, 128).

[115] 33 C.F.R. § 105.505(a)(1) (2019).

[116] Id.

Since the processing of passengers is the responsibility of the cruise ship terminal owner/operator (generally the port authority), the cost of adequate passenger screening, as well as any possible civil penalties for non-compliance, remains with that operator.[117] Additionally, in an attempt to prepare for the increase in cruises many ports are investing to improve their facilities. The cost of adequate facilities for passenger screening has been a deterrent for American ports in the past, but government streamlining of regulations, such as the Terminal Screening Program mentioned above, helps ports meet the requirements.[118] In its 2018 guidance on the TSP, the U.S. Coast Guard estimated that building a TSP from the ground up over the course of one year would cost $166,171 (USC), with $156,397 (USD) going toward designing and implementing the program (procedures and personnel) and $9,775 (USD) going toward updating the PIL (procedures and personnel training).[119]

Importantly, the U.S. Coast Guard's rulemaking in the TSP drew a marked distinction between cruise ship terminals and ports of call. Terminals, or the dock facilities where cruise lines first embark or finally disembark passengers, are covered by the more stringent security protocols similar to air travel. Ports of call, or short stay-over locations during a cruise itinerary, are specifically exempt from terminal screening procedures, and the cruise line's own on-board passenger verifications (also already mandated under U.S. Coast Guard rules) are considered acceptable security provisions.[120]

Regarding Canadian ports and passenger screening, "Facility owners and operators within the ports (i.e., terminals) are…responsible within their premises for meeting…regulatory requirements."[121] Under Canadian federal law,

> Transport Canada is responsible for implementing the marine security regulatory regime covering facilities, vessels and perimeter of ports and facilities within ports. Canada Port Authorities are responsible for putting in place and maintaining security measures to meet the requirements of the regulations (e.g., access controls, perimeter security).[122]

Unlike in the U.S., Canadian federal regulations allocate passenger screening responsibilities to the cruise ship operator.[123] Under this regulation, it is the cruise operator's responsibility to have a trained and certified security screener on staff, and to have that screener adequately check passengers for weapons, explosives, or

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[117] Consolidated Cruise Ship Security Regulations, 83 Fed. Reg. 53, 12086, 12092 (Apr. 18, 2018).

[118] Kayla Smith, *Great Lakes ports open their docks for cruise lines*, GREAT LAKES ECHO (Mar. 31, 2016), https://greatlakesecho.org/2016/03/31/great-lakes-ports-open-their-locks-for-cruise-lines.

[119] Consolidated Cruise Ship Security Regulations, 83 Fed. Reg. 53, 12086, 53,12098 (Apr. 18, 2018). It should also be noted that the TSP does not mandate hardware like x-ray machines or body scanners.

[120] *Id.* at 12098.

[121] Laureen Kinney, *Canada's Marine Security*, 4 CAN. NAVAL REV. 15, 17 (2009).

[122] *Id.* at 18

[123] Marine Transportation Security Regulations, SOR/2004-144 § 261 (Can.).

incendiaries before and during a voyage.[124] Failure to comply with this provision carries possible civil and criminal penalties including a fine of up to $5,000 (CAN) and six months imprisonment for individuals and a fine of up to $100,000 (CAN) for corporations.[125]

B. Fire Safety & Passenger Safety and Security

Cruise lines are also responsible for providing a safe and secure environment for their customers while on-board. Aside from general civil standards of due care, Canadian and U.S. federal regulations require specific actions on the part of cruise operators, with significant civil administrative penalties for non-compliance. In the U.S., 46 U.S.C. Ch. 32 details the passenger safety steps required of cruise vessels. The general safety requirement for passenger vessels apply to any U.S. vessel defined as a "passenger vessel" or "small passenger vessel" that is carrying more passengers than the prescribed minimum by U.S. Coast Guard rule (currently 6 passengers for any vessel under 100 tons).[126] Canadian vessels qualify as "Foreign Vessels", and are governed by 46 U.S.C. Ch. 32 if they are transporting more than 12 passengers.[127] Any discretionary rulemaking regarding applicability and particular standards is vested with the Secretary of the Department of Homeland Security (the supervising Secretary of the U.S. Coast Guard), or with the Secretary of the Department of Transportation in the case of St. Lawrence Seaway regulations.[128]

Regarding fire safety, 46 U.S.C. § 3503 governs all United States registered vessels with stateroom capacity for 50 or more passengers. In sum, any qualifying vessel must be constructed of fire-retardant materials, and have its propulsion, electrical, and fire suppression systems certified to meet U.S. Coast Guard regulations. Generally, without such certification, the U.S. Coastguard does not allow passenger vessels to operate commercially, can impose a civil penalty of $10,000 (USD) under 46 U.S.C. § 3504 for non-compliance, and can even impound vessels at ports of call under 46 U.S.C. § 3505. U.S. regulations appear to consider Canadian registered vessels as foreign under this scheme. All "Foreign Vessels" engaged in passenger cruising are required to comply with the International Convention for the Safety of Life at Sea (SOLAS), and if they fail to do so, they also are subject impoundment.[129]

Under Canadian federal law, the Shipping Act of 2001, paragraph 35(1)(d) and subsection 120(1), provide the Minister of Transportation authority to promulgate regulations for vessel safety.[130] For fire safety, Consolidated Regulation SOR/2017 Vessel Fire Safety lays out the applicable standards for all

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[124] *Id.*

[125] Marine Transportation Security Act, S.C. 1994, c 40 § 5(2) (Can.).

[126] 46 U.S.C. § 3202(b) (2018). *See also* PREVENTION DEP'T VESSEL INSPECTION, U.S. COAST GUARD SECTOR N.Y., SMALL PASSENGER VESSEL GUIDE 5, https://homeport.uscg.mil/Lists/Content/Attachments/1926/Small%20Passenger%20Vessel%20Guide%20NY%20published.pdf.

[127] 46 U.S.C. § 3202(a) (2018).

[128] 46 U.S.C. § 70031(2) (2018).

[129] 46 U.S.C. § 3505 (2018).

[130] Canada Shipping Act, S.C. 2001, c 26 § 35(1)(d) (Can.).

vessels either registered in Canada or operating out of Canadian ports.[131] Importantly, with the Shipping Act of 2001, Canada brought its legislation and regulations in continuing compliance with SOLAS as noted in SOR/2017. Much like with applicable U.S. regulation, Canadian ships and those visiting Canadian ports must have proper construction of its propulsion, electrical, and fire suppression systems, and be constructed of proper fire retardant materials. The penalties for operators of vessels (both individuals and corporations) for non-compliance can reach a maximum of $1 million (CAD) and up to 18 months imprisonment.[132]

Under U.S. law, the requirements for passenger safety under Title 46, Chapter 35, cover a number of areas ranging from stateroom safety to on-board video monitoring and law enforcement assistance. Notably, the 2010 Cruise Vessel Safety and Security Act (CVSSA) expanded the security responsibilities of cruise operators greatly, and instituted civil and criminal penalties for non-compliance. The following requirements and penalties under the CVSSA apply to passenger vessels capable of carrying 250 or more passengers overnight and embarks or disembarks passengers in the United States.[133]

Table 2: United States Cruise Ship Passenger Safety Requirements[134]

Operator Allocation	Requirement	Purpose
Passenger Staterooms	Peep hole or other ID means	Maintain secure guest quarters
	Security Latches	
	Time sensitive key technology	
	Security guide	
External Deck Areas	Passenger overboard system	Monitor guest security, aid in rescue/recovery
Common Areas	Public communication system	Emergency communication
	Video surveillance system	Crime detection and investigation
	Ship railings	General passenger safety
Medical Facility	Sexual assault treatment	Response to sexual assault incidents
	SANE LPN on-staff	
Crew & Crew Areas	Crew stateroom access policy	Crew policy and education, crime investigation, and crime reporting
	Incident log book	
	Criminal and safety laws	
	Invest-trained crew member	
Exterior	Acoustic/visual warning system	Communication w/other vessels

[131] Vessel Fire Safety Regulations, SOR/2017-14 (Can.).
[132] Canada Shipping Act, S.C. 2001, c 26, § 121 (Can.).
[133] 46 U.S.C. § 3507(k) (2018).
[134] 46 U.S.C. §§ 3506, 3507, 3508 (2018).

Website	Security Guide	Public notice on safety and security
	Incident Information	

46 U.S.C. § 3506, **46 USC § 3508**

Table 3: United States Civil and Criminal Penalties for Non-Compliance

Statute Violation	Violation Classification	Possible Fine	Other Action
46 U.S.C. § 3506	Civil – strict liability	$200	NA
46 U.S.C. § 3507	Civil – strict liability	$25,000-$50,000	Denial of Entry
	Criminal – willful violation	Max. $250,000	Prison max. 1 year
46 U.S.C. § 3508	Civil – strict liability	$50,000	Denial of Entry

Canadian safety and security regulations for commercial cruising are authorized by the Marine Transportation Security Act (S.C. 1994, c 40) and are contained in the Marine Transportation Security Regulations (SOR/2004-144).[135] Under the MTSR, "cruise ships" are any non-exempt vessel that can carry 100 more persons in sleeping facilities.[136] Cruise Ships, under Part 2 of the MTSR, are required to follow a number of requirements for safety and security ranging from proper ship safety certification to personnel composition and training to vessel alert systems and ship security inspections.

Table 4: Canadian Cruise Ship Passenger Safety Requirements[137]

Operator Allocation	Requirement	Purpose
Headquarters	Company Security Officer	Establish & oversee security plan
Crew & Crew Areas	Vessel Security Officer	Implement and maintain security plan, respond to emergency contingencies
	Vessel Security Personnel	
	Vessel security plan	
	Safety & training certificates	
Exterior	Security alert system	Communication w/other vessels
Common Areas	Public communication system	Emergency communication

[135] Marine Transportation Security Act, S.C. 1994 c 40 (Can.); Marine Transportation Security Regulations, SOR/2004-144 (Can.).

[136] Marine Transportation Security Regulations, *supra* note 123, § 1.

[137] Marine Transportation Security Regulations, *supra* note 123, §§ 202, 203, 204, 207, 210, 213, 261.

Failure to comply with these provisions carries possible civil and criminal penalties including a fine of up to $5,000 (CAD) and six months imprisonment for individuals and a fine of up to $100,000 (CAD) for corporations.[138] Canadian law also requires that all foreign vessels visiting Canadian ports maintain proper safety documentation in compliance with SOLAS, and that the documented compliance is commensurate with actual compliance in ship conditions and policies.[139]

XII. Regulatory Coordination between the U.S. on Safety and Security

Based on the above-described regulatory measures, there does not appear to be any overt regulatory harmonization between U.S. and Canadian federal governments on cruise vessel safety and security. However, this does not mean that cruise vessel operators are subject to two differing standards when operating on the Great Lakes. Importantly, the U.S. and Canada are signatories to SOLAS, and both countries are in substantial compliance from a regulatory perspective with SOLAS guidelines for cruise ships.[140] Canadian safety and security regulations specifically state that they adhere closely to the SOLAS guidelines, and the U.S. safety and security regulations state that the U.S. is a signatory, and carves out expectations to several requirements for SOLAS compliant foreign vessels. Operators should therefore feel comfortable in satisfying the majority of both Canadian and U.S. safety and security regulations should they follow SOLAS recommendations for their vessel class.

XIII. Safety and Security Regulations: Areas of Divergence and Conflict

However, there remain areas were U.S. and Canadian regulations diverge, resulting in possible added costs and additional regulatory compliance measures for operators. First are the law enforcement requirements contained in 46 USC §§ 3507 and 3508 and outlined in Table 2 above. These regulations effectively make cruise vessel personnel organs of law enforcement, with precisely defined areas where operators must take concrete investigative steps and cooperate with all U.S. federal law enforcement. There exists no analogous requirements imposed under Canadian law, and it appears these United States regulations apply to some Canadian flag cruise vessels operating on the Great Lakes, i.e. any vessels capable of carrying 250 or more passengers overnight and that embark or disembark passengers in the United States.

Though no analogous requirements exists under Canadian law, MTSR SOR/2004-144 Part 2 requires that vessels allocate security personnel and conduct training in all relevant security competencies that apply to their vessel class.[141] While there are substantial pieces of U.S. vessel security and operations law that mirror these requirements, there do not appear to be identical requirements in U.S. law for the broad range of training and preparedness competencies mandated under Canadian law. Given that the two countries' regulatory schemes contain such

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[138] Marine Transportation Security Act, S.C. 1994, c 40 §5(2) (Can.).

[139] Vessel Certificates Regulations, SOR/2007-31 (Can.) (citing Canada Shipping Act, S.C. 2001, c 26 §§ 35(1)(d), 120 (Can.)).

[140] 46 U.S.C. § 3505 (2018); SOR/2007-31, *supra* note 139.

[141] Marine Transportation Security Regulations, *supra* note 123, § 1213.

provisions that are not contained in their counterpart laws, these discrepancies represent possible areas where cruise operators may encounter added cost and duplicitous efforts.

CABOTAGE LAW ON THE GREAT LAKES

XIV. Review of International Cabotage Law

The international community has yet to ratify one universally accepted definition of cabotage that is binding upon all states.[142] In fact, while international law has long recognized the customs, practices, and unspoken rules of cabotage, cabotage has never been defined under international law. One might think it incapable of precise delineation since, even today, regional and national definitions vary widely.[143] For centuries, cabotage was understood by the international community to refer to the carrying on of trade, transport of cargo, or transport of passengers between two or more ports within the same country.[144]

Under the law of nations, the maritime and trade customs known today as 'cabotage' were premised upon the right of every sovereign to remain, "absolutely free and independent with respect to all other men, all other nations, as long as [the sovereign had] not voluntarily submitted to them," subject only to the limits of the natural law and tolerance of its citizenry.[145] Under this regime, a nation exercised complete dominion and control over its territory and the administration of its affairs. This includes matters of self-governance, such as the regulation of its economy and right to monopolize its commercial engagements, and international relations, particularly diplomacy, foreign policy, and treaties with other nations.[146]

The territory of a single nation included its land, coast, shores, ports, harbors, and vessels. The State retained exclusive domain, "even in parts of the sea subject to a foreign dominion" on the theory that extraction, not place of birth, was the

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[142] SEAFARERS' RIGHTS INTERNATIONAL, CABOTAGE LAWS OF THE WORLD (2018), available at https://seafarersrights.org/seafarers-subjects/cabotage/.

[143] *Id.*

[144] *Cabotage*, *in* BLACK'S LAW DICTIONARY (10th ed. 2014), Westlaw.

[145] EMER DE VATTEL, THE LAW OF NATIONS, OR PRINCIPLES OF THE LAW OF NATURE, APPLIED TO THE APPLIED TO THE CONDUCT AND AFFAIRS OF NATIONS AND SOVEREIGNS, WITH THREE EARLY ESSAYS ON THE ORIGIN AND NATURE OF NATURAL LAW AND ON LUXURY 3, 72 (Cambridge Univ. Press 2011). See also, BLACK'S LAW DICTIONARY (11th ed. 2019), which defines International Law as, "The legal system governing the relationships between countries; more modernly, the law of international relations, embracing not only countries but also such participants as international organizations and individuals (such as those who invoke their human rights or commit war crimes). — Also termed public international law; law of nations; law of nature and nations; jus gentium; jus gentium publicum; jus inter gentes; foreign-relations law; interstate law; law between states (the word state, in the latter two phrases, being equivalent to nation or country)"

[146] *See Gibbons v. Ogden*, 22 U.S. 1, 67, 6 L.Ed. 23 (1824) (explaining that the law of nations confers imperfect rights which can become "perfect only by treaty; the effect of which, is to secure to a nation rights of commerce or intercourse, which it before enjoyed at the will of another" and the right of traveling, entering into, and residing in one nation by the citizens or subjects of another depends on the same principles of international law" and a nation possessed the right to control its borders, based entirely in particulars: by foreign subjects in particular cases, under particular circumstances, or as to particular individuals, and for particular purposes, or may prohibit entrance altogether, and annex what conditions to place on permission to enter").

more determinative factor.[147] The State also retained exclusive domain to all sea "within cannon-shot of the coast" under the law of nations.[148] It was over this territory that a nation possessed the right, not duty, to oversee home trade and engage in foreign trade, which was conducted exclusively through treaties.[149] Freedom of contract was paramount in such treaties: every commercial treaty, "which does not impair the perfect right of others, is allowable between nations; nor can the execution of it be lawfully opposed."[150] For instance, if a nation engaged to another that it would sell certain merchandise or produce to the latter only, it could no longer sell it to any other nation, and "[t]he case is the same in a contract to purchase certain goods of that nation alone."[151]

By the law of nations, a country possessed the absolute right to control its trade and commerce.[152] Unlike the foreign sovereign, a private citizen was amenable to the jurisdiction of another nation for violations of municipal law. While only enforceable within the limits of that nation's territory, the practice officially recognized as lawful the prosecution of the foreign citizen who, in the course of "spread[ing] themselves through another [country] as business or caprice may direct, mingling indiscriminately with the inhabitants of that other" happened to break the law.[153] This concept also applied to private vessels, including *privateers* and "merchant vessels enter[ing] for the purposes of trade."[154]

Such jurisdiction was based on the belief that it would be inconvenient, or even dangerous, to society if individuals or merchants did not owe temporary and local allegiance, and to opt otherwise would subject the laws to continual infraction and, consequently, the government to degradation.[155] As applied to cabotage, if a private person or vessel undertook mercantile activities in another country that affected its local and national trade (whether by impeding its treaties to buy or sell goods with another, transporting its citizens between places or ports within that country, or otherwise) such insubordinate acts would have been committed in violation of the law of nations and the national or municipal law.[156] In addition, it may have posed a threat to national security and international

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[147] VATTEL, *supra* note 145 at 131.

[148] *Id.* at 158.

[149] *Id.* at 3; *see also id.* at 72-73 (stating that under the law of nations, the people of a nation owed the duty to make home trade flourish, while the nation was obliged to promote and carry on foreign trade).

[150] *The Schooner Exchange v McFaddon*, 11 U.S. 116, 144, 3 L. Ed. 287 (1812). *See also Nathan v. Com. of Virginia*, 1 U.S. 77, 1 L. Ed. 44 (Pa. Com. Pl. 1781) (explaining that "if a sovereign state turns merchant, and draws or accepts bills of exchange, its property ought in like manner to be subject to the law merchant, and answerable in the state where it happens to be imported").

[151] VATTEL, *supra* note 145 at 172.

[152] WILLIAM BLACKSTONE, COMMENTARIES ON THE LAW OF ENGLAND OF ENGLAND IN FOUR BOOKS 4 (1753).

[153] The Schooner Exchange v. McFaddon, supra note 150.

[154] *Id.*; *See Hudson v. Guestier*, 10 U.S. 281, 283, 3 L.Ed. 224 (1810) (explaining that "a seizure, beyond the limits of the territorial jurisdiction, for breach of a municipal regulation, is warranted by the law of nations").

[155] *Id.*

[156] *See* BLACKSTONE, *supra* note 152 at 4.

relations on grounds of breach of contract or "trading with the enemy."[157] Undoubtedly, the modern concept of cabotage mirrors these roots. At present, over 91 member-states recognize and regulate cabotage.[158]

XV. Review of Cabotage Law in the United States and Canada

Across many sectors, Canada and the United States have liberal trade intentions contained within their trade agreements. However, this liberal trade policy did not result in a liberal cabotage policy.[159] The United States' policy, contained within the Jones Act, restricts cabotage. It states that cargo may not be transported between two U.S. ports unless the vessel transporting it was built in the U.S. and owned by U.S. citizens.[160] This allows domestic vessels to be protected from foreign competition without receiving direct subsidies.[161]

These laws have effectively created a barrier between domestic and international shipping, as it makes it difficult for ships who are qualified to operate internationally to operate domestically, and vice versa.[162] The Jones Act provides the U.S. Navy with vessels to move cargo in case of war. The U.S. military relies on the availability of a U.S. commercial fleet to supplement its ships to transport cargo during war.[163] This should also provide professional crew for U.S. cargo vessels for the military in times of war. If the Jones Act did not exist, there may not be U.S. crew available to support the military in times of war.[164] The Jones Act also helps keep the U.S. shipbuilding industry for oceangoing commercial vessels afloat.[165]

Under the Merchant Marine Act of 1920, or the Jones Act, foreign-flagged vessels are generally prohibited from engaging in the coastwise transport of passengers and freight of goods.[166] The Jones Act is applicable to all 41,009 kilometers of the United States' waterways (19,312 kilometers of which are used for commerce) containing eleven cargo ports and five cruise departure ports, in

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[157] *Id. See also The Santissima Trinidad*, 20 U.S. 283, 338, 5 L.Ed. 454 (1822).

[158] CABOTAGE LAWS OF THE WORLD, *supra* note 142 at 52.

[159] J. R. F. HODGSON & MARY R. BROOKS, CANADA'S MARITIME CABOTAGE POLICY: A REPORT FOR TRANSPORT CANADA, Marine Affairs Program Dalhousie University 60 (2004), https://www.researchgate.net/profile/Mary_Brooks/publication/255970572_Canada%27s_Maritime_Cabotage_Policy_A_Report_for_Transport_Canada/links/004635212827919ce7000000/Canadas-Maritime-Cabotage-Policy-A-Report-for-Transport-Canada.pdf?origin=publication_detail [hereinafter CANADA'S MARITIME CABOTAGE POLICY].

[160] *Id.*

[161] Loren Thompson, *Why Repealing the Jones Act Could be a Disaster for the U.S.*, FORBES (Oct. 17, 2017), https://www.forbes.com/sites/lorenthompson/2017/10/17/maritime-security-five-reasons-the-jones-act-is-a-bargain/#6ade9a43d960 [hereinafter *Repealing the Jones Act*].

[162] J.R.F Hodgson & Mary R. Brooks, *Towards a North American Cabotage Regime: A Canadian Perspective*, 1 CAN. J. TRANSP. 19, 30 (2007).

[163] Repealing the Jones Act, supra note 161.

[164] *Id.*

[165] *Id.*

[166] 46 U.S.C. § 55102, 55103. *See Chicago Convention on International Civil Aviation*, arts. 1-4 (Dec. 7, 1944), https://www.icao.int/publications/documents/7300_orig.pdf. *See generally Convention on the International Maritime Consultative Organization*, Chapter XII, Vol. 2 (Mar. 6, 1948).

addition to the 3,611 United States-owned commercial vessels and myriad of foreign-flagged vessels that tread into U.S. waters on an annual basis.[167] At a minimum, and with limited exceptions, the Act imposes two preconditions for a ship to lawfully carry cargo between two points in the United States; (1) the ship must have been "built in the United States," and (2) the ship must be "wholly owned by the citizens of the United States."[168]

By supporting merchant marines, shipbuilding and repair facilities, the Jones Act serves dual purposes. First, to promote the national defense and second, to aid in the development of U.S. commerce at all levels.[169] The United States shares the Saint Lawrence Seaway of 3,769 km, including the Saint Lawrence River of 3,058 km, with Canada.[170] The United States is not alone in its Jones Act provisions. At least 40 countries have similar exclusionary cabotage laws that use national preference as the basis for permitting entry into their domestic waterborne trade, 37 countries have sovereign ownership provisions, 17 countries have "some sort of domestic fleet subsidy," and 13 countries provide indirect subsidies.[171]

Canada has implemented the Coasting Trade Act and the Customs Tariff. The Coasting Trade Act allows only ships registered in Canada, and either built in Canada or who have paid the import duty, to have unrestricted access.[172] Shipping companies must apply for permission to operate a non-Canadian flagged vessel between Canadian ports.[173] Often, the companies that make these requests are Canadian companies that wish to use their foreign flagged vessels within Canada, or to charter a foreign vessel for a period of time.[174] If they are approved, they can operate in Canadian waters under the flagged country's labor rules with their crew being granted foreign worker permits.[175]

In Canada, the Coasting Trade Act (S.C. 1992, c.31) and the Canada Shipping Act (S.C. 2001, c.26), govern cabotage.[176] Coasting trade, or cabotage, refers to "the carriage of goods by ship, or by ship and any other mode of transport, from one place in Canada or above the continental shelf of Canada, either directly or by way of a place outside of Canada but, with respect to waters above the continental shelf of Canada, includes the carriage of goods only in relation to the exploration, exploitation, or transportation of the mineral or non-living resources of the

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[167] *World Factbook* (CIA), (last visited Mar. 26, 2019), https://www.cia.gov/library/publications/resources/the-world-factbook/rankorder/2108rank.html.

[168] 46 U.S.C. § 12112(a)(2)(A), 55102(b)(1). See 46 U.S.C. § 12112(a)(2)(B) (explaining that a vessel captured and construed as a prize of war, a vessel acquired as a result of civil forfeiture, or a qualifying wrecked vessel may also receive a coastwise endorsement).

[169] 46 U.S.C. § 50101.

[170] *World Factbook, supra* note 167.

[171] CABOTAGE LAWS OF THE WORLD, *supra* note 142 at 46.

[172] Canada's Maritime Cabotage Policy*, supra* note 159 at 65.

[173] Peter Ziobrowksi, *Shipping News: Canadian ship owners manipulate cabotage rules*, THE CHRONICLE HERALD (Sept. 26, 2018), https://www.thechronicleherald.ca/business/shipping-news-canadian-ship-owners-manipulate-cabotage-rules-244585/.

[174] *Id.*

[175] *Id.*

[176] CABOTAGE LAWS OF THE WORLD, *supra* note 142 at 16.

continental shelf of Canada."[177] In contrast to the United States, Canada's cabotage laws govern roughly 4,000 kilometers of inland waterways, including the Saint Lawrence Seaway that it shares with the United States, thirteen ports and terminals, as well as 657 Canadian-owned commercial vessels.[178] Since the Treaty of Paris in 1763, all British ships (all vessels registered in the Commonwealth) have been permitted to engage in the Canadian coasting trade whether registered in Canada or elsewhere in the Commonwealth.[179]

The United States' cabotage goals with any country are to further the purposes articulated under the Jones Act. Namely, to enhance domestic commerce, provide for the national defense, and minimize risk to national (including border) security.[180] Specifically with Canada, the United States strives to promote education and awareness of coastwise laws on both sides of the border, so that both countries' cabotage protocols are consistently enforced.[181] Unlike the United States, Canada's cabotage policies are set out in various parliamentary reports. Similar to the United States under the Jones Act, Canada's cabotage policies recognize the merits of governmental control of shipping, which include financial security and stability (collateral bargaining), stability of trade and shipping services, promoting national defense, and promoting the domestic shipbuilding and repairing industry in Canada.[182] The goals of Canada-U.S. cabotage include peaceful resolution of their transnational maritime boundary disputes, promoting trade consistent with international policies, and encouraging the free flow of trade while protecting their borders.[183]

XVI. Regulatory Interplay between Canada and United States Cabotage Laws

Shipping in the Great Lakes creates a confluence of U.S. and Canadian private and public sectors. The private sectors in each country own most of the ships and terminals within the ports. Short sea shipping in the context of the United States and Canada is often defined as "a multi-modal concept involving the marine transportation of passengers and goods that does not cross oceans and takes place with and among Canada, the United States, and Mexico."[184] Short sea shipping is

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[177] *Id.* at 57.

[178] TRANSPORT CANADA, MARINE TRANSPORTATION ANNUAL REPORT (2011), http://www.tc.gc.ca/eng/policy/anre-menu-3019.htm

[179] ROYAL COMMISSION ON THE COASTING TRADE, REPORT OF THE ROYAL COMMISSION ON THE COASTING TRADE (Dec. 9, 1957), http://publications.gc.ca/collections/collection_2016/bcp-pco/Z1-1955-40-1-eng.pdf. *See generally*, U.S. Office of the Trade Representative: North American Free Trade Agreement (1994) (stating that the purpose and scope of NAFTA is to allow the free movement of goods across the border for international activities, but not to facilitate access to the domestic labor market).

[180] U.S. Dept. of Homeland Security office of U.S. Customs and Border Protection*, CBP furthers partnership with cruise industry*, (Jul. 13, 2018), https://www.cbp.gov/newsroom/local-media-release/cbp-furthers-partnership-cruise-industry.

[181] *Id.*

[182] CABOTAGE LAWS OF THE WORLD, *supra* note 142 at 73.

[183] *See generally id.*

[184] Riad Mustafa, Ming Zhong & Michael Iracha, *Short Sea Shipping in Canada Regulatory and Policy Issues,* CANADIAN TRANSPORTATION RESEARCH FORUM 1, 4 (last visited Mar. 28, 2019), https://ctrf.ca/wp-content/uploads/2014/07/24MustafaZhongIrchaShortSeaShippinginCanada.pdf.

beneficial for many of the companies as "on average, one sea vessel can replace about 870 trucks or 225 rail cars."[185] The Canadian and U.S. governmental agencies are responsible for making sure that the waterways are open, and that trade can flow through them. A ship on the Great Lakes involved "in cross border trade will have to comply with approximately thirty sets of U.S. and Canadian regulations that are administered by ten different departments on the federal and provincial level alone."[186]

The U.S. cabotage laws, the Jones Act and the Passenger Vessel Services Act, require that, "vessels be built in the U.S., that U.S. citizens own a majority of its stock, and that it is crewed by U.S. citizens."[187] This requirement applies to any vessel engaged in trade (in merchandise or passenger transport) between two ports of call in the U.S.[188] The Canadian Coasting Trade Act of 1992 requires that only Canadian flagged vessels crewed by Canadian citizen carry freight or passengers between two contiguous Canadian ports.[189] It is important to note that the Jones Act only applies to the U.S. ports that originate and receive merchandise or passengers – a vessel is permitted to travel between two shipping and/or receiving U.S. ports with foreign stop-overs in between.[190] Likewise, if the vessel traveling between two Canadian ports stops in the U.S., it is not subject to the Canadian Coasting Trade Act.

When considering how cabotage impacts Great Lakes commercial cruising, it is worth remembering that restrictive cabotage regulations in both Canada and the United States were envisioned to protect commercial shipping markets. More specifically, these cabotage laws were designed to protect national oceangoing commercial fleets. Their purpose and substance did not consider the intricacies that would later present themselves on the Great Lakes in the commercial cruising context. It is in this context that possible exceptions to general cabotage requirements could be beneficial to the cruising industry, while at the same time leaving the stated regulatory goal of protecting national merchant marine fleets intact.

CONCLUSION: MOVING FORWARD WITH REGULATORY AND LEGISLATIVE INNOVATION

The Great Lakes themselves and all their related attractions will continue to be compelling destinations for vacationers from North America and beyond. Great Lakes tourism remains strong and is poised to grow further, presenting opportunities for the commercial cruise industry. However, as with any industry, any projected growth in the Great Lakes commercial cruising faces hurdles. In

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[185] *Id.* at 2.

[186] Richard D. Stewart, *Great Lakes Marine Transportation System,* MIDWEST FREIGHT CORRIDOR STUDY 1, 4 (last visited Mar. 28, 2019), http://wupcenter.mtu.edu/education/great_lakes_maritime/lessons/Grt-Lks-Maritime_Transportation_System_Report_Stewart.pdf.

[187] *Id.* at 10.

[188] 46 U.S.C. § 55102, 46 U.S.C. § 55103.

[189] Stewart, *supra* note 186 at 10.

[190] *Id.*

order to gain market entry and maintain operations, cruise line operators must comply with a plethora of regulatory obligations, often in both Canada and the United States. In this context, long-standing maritime regulations such as cabotage, passenger screening and security, and pilotage present complex legal and regulatory challenges as defined throughout this work. These requirements result in added compliance and operating costs for potential cruise operators.

When discussing pilotage, commercial cruise operators face regulatory uncertainty across the border in the following: variation in pilotage fees depending on a ship's itinerary and ports of call; and, possible necessity of engaging multiple pilots for a complete Great Lakes transit. These issues can and should be addressed by the relevant governing bodies in both Canada and the United States. Specifically, the Department of Homeland Security and Transport Canada have the rule-making authority under the acts discussed above to enact regulations that will both (1) remain true to the legislative intent of Congress and Parliament, and (2) alleviate the regulatory burden on a fledgling industry.

Regarding safety and security, alleviating possible disjoints in regulation (particularly in passenger screening and passenger safety and security) may present a more difficult task. Since several of the regulations at issue are contained in federal law itself, and not simply agency rule making based on federal authority, further legislation would be necessary. However, given a concerted effort on the part of all stakeholders, the proper changes would likely be reasonable and palatable for lawmakers.

Regarding cabotage, the prohibition on foreign vessels effecting transport between Canadian and United States ports certainly can present an impediment to certain desirable itineraries. Again, since this prohibition is contained in both countries' federal law, a legislative effort would be necessary to fully rectify the issue. Given a concerted effort on the part of all stakeholders, the proper changes would also likely be reasonable and palatable for lawmakers, as a workaround could be crafted that does not undermine the original intent of both countries' protective cabotage laws.

A final, more holistic solution may also be possible, one that would allow the United States and Canada to examine the Great Lakes as a whole – a Great Lakes Navigation Treaty.[191] This solution would have many benefits, chiefly that it would allow the two countries to examine the Great Lakes – St. Lawrence Maritime System as the unit it truly is, and come to mutual agreement on how best to both use and steward a unique and precious resource. While the scope of such an agreement would undoubtedly reach well beyond the confines of commercial cruising, cruising would be one major area of discussion and joint policy making during such an endeavor.

[191] Piskur, *supra* note 2 at abstract.