

Canada-U.K. Colloquium 2016

THE TRANSITION TO A LOW-CARBON ECONOMY



24 Nov - 26 Nov
Fairmont Hotel Macdonald, Edmonton



2016 CANADA-UK COLLOQUIUM REPORT

November 24-26, 2016 ▪ Edmonton, Alberta
“The Transition to a Low-Carbon Economy”

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1. Preface

We are delighted to share the report of discussion held in Canada in November 2016 about the dynamics of getting to a low-carbon economy both in the UK and in Canada. The role of the Alberta Premier Rachel Notley in the briefing day for all attendees was of paramount importance and extremely helpful, as well as the role played by various ministries and key participants from industry, civil society, academia, and research communities.

The discussions on the briefing day at the Government House in Edmonton, as well as the colloquium and break-out sessions all took place under the Chatham House rule.

This report presents the key conclusions and recommendations reached at the colloquium, with appendices featuring an overview of all participants, break-out session reports, sponsors, and the official programme.

The ability of Britons and Canadians to work together on the key issues of concern should not be underestimated. The quality and insights of the 2016 CUKC discussions underline the importance of the collaborative and pragmatic nature of our bilateral relationship.

As co-hosts we very much appreciate the support we have received for this colloquium from our sponsors.

The Hon. Hugh D. Segal & Philip J. Peacock
CUKC 2016 Co-Chairs



2. Letter of Welcome from Prime Ministers



PRIME MINISTER · PREMIER MINISTRE

Canada and the United Kingdom (UK) are likeminded allies that enjoy a longstanding robust bilateral relationship built upon strong historic and people-to-people ties. Prime Minister May and I are fully committed to further expanding and deepening this relationship.

The annual Canada-UK Colloquium is one mechanism by which we foster this relationship. This year's event in Edmonton will focus on "The Transition to a Low-Carbon Economy." Delegates will consider ways in which Canada and the UK can cooperate and learn from each other on achieving our targets for greenhouse gas emissions.

Canada is showing leadership in the fight against climate change, along with key partners such as the UK. A clean environment and sustainable economy go hand in hand, and we have an opportunity to innovate and share solutions with the world. Canada has made the transition to a low-carbon economy a priority. Canada is working with provincial and territorial governments to develop a Pan-Canadian Framework for Clean Growth and Climate Change that will help achieve our emission reduction targets and set the country on a path towards low-carbon economic growth. Canada is also working with partners through the Carbon Pricing Leadership Coalition.

We look forward to further international cooperation in this sector and hope your discussions will help to identify potential further synergies between the UK and Canada.

It is with great pleasure that I welcome all participants of the 2016 Canada-UK Colloquium, and wish you a successful event. I would also like to take this opportunity to welcome you to Edmonton, which in addition to being a gateway to the North, is a leading centre for research and innovation leading towards a low-carbon economy.

Sincerely,



10 DOWNING STREET
LONDON SW1A 2AA

THE PRIME MINISTER

Britain and Canada are natural partners, and Prime Minister Trudeau and I are fully committed to making the most of the strong relationship between our two countries. The Canada-UK Council, with its annual policy conferences, is an important vehicle for this. These meetings not only help to build networks of expertise, but also develop practical policy proposals in specific areas.

This year's meeting, taking place in Edmonton, Alberta, is devoted to 'The Transition to a Low-Carbon Economy'. The UN Paris Agreement on climate change last year was a global breakthrough, but it only set the framework for international action. The focus now shifts to delivery of the "nationally determined contributions" to which each country is committing.

Big questions remain: how, in practice, can Canada and the UK fulfil these commitments in a way that contributes to economic development? What joint initiatives might we take to achieve this? And what successful action in one country might usefully be replicated in the other?

The challenges are formidable but both the UK and Canada are already deeply engaged with this agenda. I have no doubt that we can learn a great deal from one another through the forum of this year's conference.

I wish the 2016 Canada-UK Colloquium every success in exploring even closer cooperation between our two countries as we address these vital, and urgent, questions.

November 2016



3. CUKC Overview & Key Objectives

**THE 2016 Canada – U.K. Colloquium
“The Transition to a Low-Carbon Economy”
November 24-26, 2016**

Edmonton, Alberta, Canada

Chair: The Honourable Jean Charest

OVERVIEW

In December 2015, the Paris Agreement was adopted by 196 governments at the 21st Conference of the Parties. It limits average global warming to 2°C above pre-industrial global temperatures — and seeks, as an aspirational target, to limiting warming to 1.5°C. The focus now shifts to the efforts of individual countries to make “nationally determined contributions” to the global effort.

The 2016 Canada-UK Colloquium will focus on ways in which Canada and the United Kingdom could cooperate and learn from each other on achieving their “nationally determined contributions.” How does each national economy propose to manage the transition to a low-carbon economy in accordance with the ambitious timetables to which they are committed?

OBJECTIVES

The objectives of the Canada-UK Colloquia have evolved over the years to focus closely on the current policy priorities of our two countries.

Our key objectives include:

- Building up contacts between leading experts in the two countries;
- Contributing to the development of public policy in both countries;
- Identifying ways in which Britain and Canada can work together in an international context to meet their objectives in specific policy areas;
- Finding ways of achieving positive outcomes from the events and encouraging follow-up; and
- Encouraging active participation of promising young people to ensure that the benefits of the exchanges are carried forward into the future.



4. Summary of the Briefing Day

“The Transition to a Low-Carbon Economy: Alberta’s Innovation through Implementation”

Government House, Edmonton, Alberta

The colloquium was preceded by a full-day briefing hosted by the Government of Alberta and key experts, aimed at providing Canadian context for this year’s topic and examining Alberta’s leadership on climate change.

Until the oil price meltdown of 2014, Alberta was Canada’s fastest-growing economy, fuelled by investment in carbon-intensive oil sands production and heavily reliant on coal-fired electricity. The province was one of the only jurisdictions in North America to offer no energy efficiency programs for homeowners or business. That fact underscores the prevalent assumption that access to seemingly endless supplies of coal, oil and natural gas could be counted on to ensure the province’s prosperity.

The Alberta government faces a challenge in winning approval from its citizens for its climate action. The policy, established in 2015, consists of:

- a carbon tax, which will rise to \$30 a tonne in 2018,
- the phase-out by 2030 of coal-fired power which now provides most electricity in the province;
- a target of 30% renewable energy for electricity generation by 2030;
- a 100 megaton annual limit on GHG emissions from oil sands production by 2030 (from a current level of around 80 MT – thus forcing emissions reduction as a pre-requisite for significant growth).

It is therefore no coincidence that some 45 per cent of Albertans are currently sceptical of consensus science in climate change. Cross-Canada polling consistently shows that the provinces which have the most to lose also exhibit the lowest acceptance of the science and least support for action, and vice versa. A representative from the Alberta Climate Change Office presented the province’s Carbon levy which they hope will provide \$9.6 billion in public funds.

A civil society representative recognized the importance of Alberta’s leadership in moving swiftly to present and implement a climate action plan. This is especially crucial as Alberta’s economy accounts for 34% of Canada’s emissions, reflecting the challenge to support economic growth while addressing climate change.



There were public concerns raised about the government's initiatives and the speaker mentioned how 45% of Albertans doubt the science of climate change. In due time, public perception will shift as well, though action on climate change in Alberta may remain a highly partisan issue. To address public concerns, the Alberta government is leading a public education campaign in conjunction with their climate action plan.

In Canada, and Alberta in particular, Indigenous communities are leading initiatives that empower members and utilize renewable energy. A powerful example is the Green Arrow Renewable Energy Corporation founded by members of the Montana First Nation. Speakers discussed several solar power installations and infrastructure retrofits led by First Nations groups. These contracts resulted in training of indigenous peoples to install renewable energy technology and provided sustainable energy for several First Nations communities. Together, such projects have trained over 32 First Nations members and installed over 160 kW of renewable power sources. This reflects a model which should be encouraged and supported in future policy.

In conjunction with training First Nations communities on renewable technology, another major issue is training the labour force from carbon-intensive industries so that they may transition to jobs in a low carbon economy. One speaker stated that the focus should be on training installation and maintenance workers through re-training and certification programs, which lower entry barriers but ensure a high standard of quality.

Training a workforce ready for a low carbon economy remains a key challenge for the future of carbon pricing across Canada. Canada's provinces are diverse in that some have implemented cap-and-trade, carbon taxes and some nothing at all. However, the federal government has mandated that all provinces must implement some form of carbon tax by 2018, which is encouraging but also requires an economic understanding of such policy changes. One speaker raised several questions including how does public and economic policy deal with regional price differentials, what should national strategy be looking towards past 2022 (date current federal plan extends to) and how will policy cover industries central to different regions' economies.

One representative from the Government of Alberta provided a detailed overview of Alberta's electricity system. Notably there is a 16,000 MW capacity with demand regularly around 10,000 MW. In Alberta, most demand originates in industrial and commercial sectors. The province is unique in having no public debt for its electrical generation and infrastructure. Future strains will come from matching coal phase-out with increased production in renewable and alternative sources by 2030. To balance changes in electricity sources, another speaker offered an overview of integration of renewable sources to the electrical grid in a way that manages fluctuating supply and demand appropriately.

Over the special luncheon hosted by the Government of Alberta, the Honourable Rachel Notley, the Premier of Alberta delivered a keynote address, emphasizing the leadership within the province to mitigate climate change while supporting economic growth.



Alberta's key goal is to balance the province's economic strengths with social responsibility on climate action. The Premier put forward the argument that climate action was necessary for three reasons: to win greater social acceptance for the province's oil exports, to diversify the economy, and to do the right thing for the global environment.

However, colloquium participants were given a vivid illustration of how difficult it can be to "sell" climate leadership to a sceptical population. Two-thirds of respondents in Alberta oppose the carbon tax and are very wary of the prospect of higher electricity prices from the coal phase out and renewable programme. *(Please see Appendix II for the full text of her speech.)*

A speaker from Alberta Energy Regulator discussed encouraging technological innovation so that regulations do not block new technologies from entering the energy market. The speaker focused on technologies that lower methane as it contributes strongly to CO₂ emissions, aiming for a 45% reduction in methane release through regulation changes. Another speaker discussed an investment fund targeted on accelerating technological development that reduces greenhouse gas emissions. They have provided \$320 million for projects that by 2020 will reduce emissions by 7 MT. They are trying to balance funding between demonstration of technologies, and the research and development of new technologies. Intellectual Property from supported projects stays with the inventors to spur innovation. The main stipulation for funding is that projects must reduce emissions.

Following this, another speaker discussed federal and provincial politics of climate action in Canada. The speaker noted that the last 10 years was a time when the federal government's mandate was to align with the United States policy. Now the priority appears to create progressive policy, not mimicking the US. Also new is a Federal-Provincial-Territorial approach to climate action policy, working towards a pan-Canadian strategy. However, there are some regional challenges, most notably Saskatchewan, that will need to be resolved. Additionally, industry stakeholders will want to weigh in on policy, which remains to be seen. A representative from Cenovus Energy discussed their collaboration on the Climate Leadership Plan with the Government of Alberta, focusing on the importance of public-private partnership for progressive policy development.

The co-chairs of the CUKC delivered closing remarks and thanked the Government of Alberta for hosting this briefing day.



5. Rapporteur's Report by Shawn McCarthy

INTRODUCTION

This report attempts to capture the highlights of three days of intensive discussion across the broad landscape that climate change touches. It is not exhaustive in the representation of either points of view or individual recommendations that participants brought to the table. The Colloquium was structured around the following topics:

- Targets and goals
- Carbon pricing and eco-fiscal policy
- Fossil fuels in a low carbon economy
- Mobility energy
- Financing policy initiatives
- Demand side policy
- Measurement, management and transparency
- Building public and political consensus

Climate change has often been called the greatest challenge of our generation, and the 53 participants at the Canada-UK Colloquium did not dispute that characterization. Unless the governments, businesses and civil society summon the necessary will to act, one speaker warned, we and our children face a dystopian future of environmental collapse, famine, inundations of islands and coastlines, sometimes exacerbated by storm surge, climate refugees and war.

Among the colloquium participants, there was a sense of optimism that we have turned a corner with momentum for a transition to a low-carbon economy. Pace is now the key issue. Smart policy could accelerate the pace and avert the worst impacts of global warming while ensuring that the poor, indigenous peoples, or the regions that have relied most heavily on fossil fuels, don't get left behind. Political, corporate, academic, and civil society leaders must focus on bringing citizens with them through election and economic cycles. The alternative is a populist backlash that will frustrate the effort to implement smart policies.

STAKEHOLDER COLLABORATION

At the beginning of the CUKC deliberations, the Chair noted some key differences between Canada and the UK regarding climate policy. The United Kingdom has a central government, and its economy is not primarily driven by resources. It was the first country in the world to adopt a statutory emission reduction target (under the Climate Change Act 2008) and a system of 5 year 'carbon budgets' (or emission ceilings) with oversight from an independent expert body (the Committee on Climate Change). Also climate change and energy policy is an area of European Union competence and this has had a significant influence on UK policy.



Canada's federation is decentralized and diverse with significant provincial differences that complicate federal policy making. Provinces have ownership of, and jurisdiction over, natural resources and there are differences in carbon-intensity and climate policy among them.

Canada has a positive legacy of acting on environmental issues such as acid rain and the elimination of CFCs (*cf* the Montreal Protocol). It is possible to find solutions, the Chair concluded. The biggest challenge is in the design: adopting policies that are both politically attractive and economically effective and sustainable. One speaker in emphasising the importance of collaboration, pointed to the Alberta example in which Premier Notley had the support of major energy company CEOs, environmentalists and indigenous leaders when she announced her climate leadership plan. Finding common ground is not easy, but is essential for the long-term success of her policy, according to Premier Notley.

TARGETS AND GOALS

We should not confuse targets with goals, another speaker warned. The goal is a liveable planet; the targets, including the Nationally Determined Contributions (NDCs), are mileposts that can be adjusted as circumstances require. Thus, the 2% emissions target set at the Paris COP21 meeting is not the goal but the target and was the best judgement beyond which it was increasingly difficult to reach the goal of a managed climate. Measurement, transparency and accountability are key.

BUILDING PUBLIC AND POLITICAL CONSENSUS

In pursuing climate policy, we need to take consumers, investors and citizens with us and in return demonstrate transparency and accountability. Understanding the impacts of climate change that people suffering under in the UK (eg through flooding) helps citizens understand the importance of dealing with climate change – both mitigation and adaptation imperatives, one speaker noted. An arm's-length, quasi-governmental agency that draws on experts from business and civil society would lend credence to climate-related actions and highlight efforts to adjust to impacts. Canada had such an agency in the National Roundtable on the Environment and Economy. A version of this could be revived.

The political risks of addressing climate change are falling. The costs of the low-carbon alternatives are dropping to levels that make them competitive with fossil fuel energy in some areas. We have moved from a focus on constraint, to opportunity. Political leaders should put less emphasis on “how to stop people from doing something,” to the more positive, “how to encourage people to do something”.



Whilst decarbonisation is the central issue in the transition process, it is important to appreciate the need to take a holistic approach, one that considers the infrastructure needs of the economy alongside the specific needs associated with decarbonisation. This has been recognised in the UK by the creation of a National Infrastructure Commission separate from the Committee on Climate Change to provide independent advice to government and lend much needed legitimacy to important policy decisions.

It is also worth remembering that the UK and Canada have to date relied heavily on fossil fuels to drive their respective economies and to raise tax revenues, particularly from the North Sea in the case of the UK, are likely to rely on fossil fuels for some years, especially if in the UK shale gas extraction succeeds economically.

DEMAND SIDE POLICY

The colloquium acknowledged the need for a “just transition” from a largely fossil fuelled economy to a low-carbon energy system. In Canada, indigenous and remote communities suffering from energy poverty are eager to access low-cost sources of power, but also want clean energy and an equity stake in projects that provide it. In the UK, some villages have taken the lead in providing their own clean energy solutions. Participants agreed that governments need to pursue mechanisms that promote energy democracy and public engagement, while acknowledging that many citizens simply want to “flip a switch” to obtain their required energy. Distributed power sources represent a viable and affordable option in many geographical areas. This may have a knock-on effect on the business model of some utilities.

Participants noted that government must take great care to ensure that climate policies do not have a regressive impact on the poor. Subsidies for home energy renovations and electric vehicles, for example, are rarely accessible by low-income households and can amount to subsidies for the upper-middle class. The boom in urban real estate markets has often forced people of more modest means to live in suburban areas where they rely more heavily on cars. Additional carbon taxes on motor fuels can be steeply regressive.

CARBON PRICING AND ECO-FISCAL POLICY

The colloquium had a spirited discussion on the benefits and drawbacks of carbon pricing. It was generally agreed that carbon pricing is a powerful tool to incentivise carbon mitigation and energy innovation. The existing price and the promise of rising levels over time send signals to the market with regard to decisions on investment, as well as future supply and demand. However, price signals can be less effective where regulations and market power of incumbent technologies prevent adjustment. It is also important for economies to be globally carbon competitive if carbon leakage is to be avoided.



One speaker gave the example of Californian regulations that prevent concrete companies from adopting low-carbon innovation. It was emphasised again that carbon pricing is a regressive tax, hitting the poorest citizens the hardest. The government must also keep exceptions and exemptions to a minimum to maintain the efficacy of the measures.

One speaker suggested the overall effort should be aimed at decarbonizing the power system and shifting as much of the economy as possible to electricity generated through other means. Some industries will have trouble making that transition, including for example, cement and oil refining. Carbon capture and storage technology (CCS) remains an important option for those industries where it is not feasible to decarbonise.

Policymakers need to be aware of the knock-on effects of their efforts. Success in driving down oil demand will mean a lower price which will encourage consumption. Complementary policies to carbon pricing should aim to eliminate market inefficiencies and enhance the power of pricing. At its core, carbon pricing, whether through tax or a cap-and-trade model, is a lever to influence the allocation of capital and reduce carbon emissions. To drive the long-term global transition, the power of a carbon price, whether through a tax or trading system, to direct capital flows, should not be under-estimated, a speaker noted.

FINANCING POLICY INITIATIVES

Several participants stressed the critical importance of capital markets in quickening the pace of transition to a low carbon economy. Speakers noted the work of the G20 Financial Stability Board (FSB) chaired by Bank of England Governor Mark Carney and its initiative to establish the Task Force on Climate-Related Finance Disclosures (chaired by Michael Bloomberg) which in its report urges corporations and institutional investors to adopt a voluntary system of rigorous and comparable carbon-risk disclosure. Their message, which was echoed in the colloquium: Climate change represents a systemic risk to the global economy.

In some cases, asset owners will look to re-weight their portfolios to reduce their carbon risk. In other cases, asset owners and shareholders will use disclosure to engage with corporate boards and management to encourage them to set and meet targets for emissions reductions. One speaker stressed that decarbonisation of investment portfolios was not about divestment but about working with companies to understand their lower carbon transition. Firms need to be held accountable for the resilience of their business models over the longer-term. Another financial market participant said investors are eager to finance clean technology opportunities, but many projects cannot get funding in part because scale-up risks are high. It is important to give policy clarity and certainty. Investment will go where there is policy stability.



One speaker pointed to an innovative product, a Government-issued Climate Performance Bond that is gaining traction in continental Europe. The approach is designed to say, *we mean to implement targets and we will issue performance bonds against those targets*. The bond enables hedging against policy implementation risk.

MOBILITY ENERGY

Speakers also addressed the importance of personal transportation in climate change. General Motors is making a major bet on electric vehicles (EVs), as governments across North America invest in charging stations. However, for the moment EVs remain a money-losing proposition for carmakers. It is not certain that they will provide cost-effective emissions reduction, as the efforts to increase the fuel efficiency of the internal combustion engine are also making great strides. There has been a 50-70% growth in car sales but EVs still account for less than 1% of total car sales in North America. According to Bloomberg New Energy Finance by 2040, some 13 million barrels of oil per day will be displaced by electric vehicles — equivalent to 14% of estimated global crude oil demand in 2016 estimated by the US Energy Information Administration (EIA). With its higher density and shorter travel distances, the UK may see a faster adoption of EVs than Canada (but the main driver for manufacture and adoption will be China).

Canada's low-emissions electricity system does however make the EV option attractive. Several speakers in the plenary session and in a breakout group noted that the turn-over in the auto fleet is slow and policies may need to be deployed to encourage the early retirement of aged vehicles (such as the scrappage scheme that has been successfully run in the UK to boost new car sales). There may also be value in financing schemes to underwrite the residual value risk of EVs to assist leasing packages.

FOSSIL FUELS IN A LOW CARBON ECONOMY

A long-term decarbonisation agenda aims for a zero-emission (carbon-neutral) electricity system with associated electrification of transportation and heating. Electrification should be encouraged by improvement in the cost effectiveness for domestic heating and cooling and transport. Participants pointed to broader trends in personal transportation that contribute to increased energy productivity. It is estimated that currently a vehicle sits in a driveway or parking spot for 90 per cent of the time, and often has only one passenger per trip. The decline in vehicle ownership, the growing use of bicycle transportation, the emergence of Uber, car sharing and driverless cars all point to a fundamental shift, at least in urban areas. Some car manufacturers are moving away from a business model based on car sales to one based on mileage sales. For freight, there should be opportunities for a modal shift from road to rail.



Energy efficiency is a critical piece of the transition puzzle. In some ways, it is more challenging than supply issues. Energy production is dominated by a relatively small number of larger players, while every household and business is involved in decisions regarding energy consumption. For businesses energy efficiency measures often represent a viable outlay with early return on investment.

There was no consensus among the group on how responsive the broad population might be to exhortations regarding energy use and climate change. One speaker said most people do not want to think about their energy use, and resist technology like smart meters that require them to be more actively engaged in energy consumption. Another speaker showed satellite imaging from an Alberta program known as MyHeat.com, which challenges homeowners to view the heat loss from their homes and to find ways to reduce it. A speaker noted rates of home ownership are an important factor: where renters pay utility bills, there is little incentive for either tenant or landlord to invest in home energy efficiency. Revised local government regulations could solve this problem by incentivizing landlords to maximize energy efficiency and tenants to minimize energy use. The breakout group on demand management stressed two critical elements: engagement and trust. Product labelling schemes which indicate energy efficiency and carbon footprint are emerging and are very useful in raising consumer awareness and potentially influencing purchasing decisions.

Carbon pricing adds incentives in the market for consumers at all levels to use less fossil fuel-based energy. However, higher energy prices create a political backlash. Consumers are also often confused by the variety of sources of information on energy efficiency and programs and the disparity between them. The Canadian government's Energy Star program for appliances is a recognized standard and could be expanded to other areas. Efficiency Nova Scotia is a trust "one-stop shop" that provides and certifies partners and provides "advisors."

At the grid level, demand response programs have proven effective in shaving peak demand, reducing the need for fossil-fuel plants to serve high-demand times. The regulatory system does not always adequately value those services. Similarly utilities can make it difficult for system operators to add storage technology.

The UN Paris agreement on Climate Change adopted in December 2015 and effective in November 2016 resulted from an unprecedented convergence of governments, both national and sub-national, business leaders and civil society, in agreeing on the pressing need for global action. It was, one speaker suggested, a plateau long in the making that will provide the base for the next plateau. However, the election of Donald Trump, an avowed climate change sceptic, suggests greater political consensus will be hard to win and the hitherto existing consensus even harder to sustain. Climate action must be viewed and communicated as a core value, not a set of issues. Citizen engagement is challenging due to long time frames.



The view that Canada, for example, contributes less than 2 per cent of global emissions and therefore costly action is unwarranted leads to a *tragedy of the commons*. It is hard to demonstrate any causal link between climate change, individual extreme weather episodes and events like the Fort McMurray forest fires. The important issues for communities are jobs, security and prosperity, one speaker said, and climate policy must be put in that context. Elements of civil society can be helpful in reinforcing the notion of climate action as a civic value.

MEASUREMENT, MANAGEMENT AND TRANSPARENCY

Transparency and accountability remain critical tools for public engagement and smart government policy-making. In international agreements, national commitments need to be transparent, measureable and verifiable. Government climate data should be accessible in its format and available to business, civil society and the public. Independent institutions may be a more trusted source for the dissemination of climate data than government departments which serve political masters. Financial institutions and regulatory agencies will also be critical sources of climate-related data, as relates to asset values, investment risk and rates of return for competing higher-carbon and lower-carbon options. A closer examination of the connection between cleaner air from lower emissions and better health would provide persuasive arguments for the self-interest in implementing low carbon (and also low nitrogen) policies.



6. Conclusions & Key Recommendations

With limited time and with such a vast canvass it was inevitable that certain areas would not receive the attention due to them, such as the role of agriculture, air and freight transportation, cities, the Arctic and nuclear energy. Through informed and sometimes challenging discussion, the colloquium participants nonetheless identified the principles and strategies they believed would accelerate the shift to a low-carbon future with public support for a just transition. It was agreed that smart policy drives down the cost of climate action while enhancing the political support.

Key recommendations

- ❖ In Canada, federal and provincial governments must engage in a collaborative partnership to ensure a successful, long-term policy.
- ❖ Collaboration among government, business, civil society, local communities and indigenous people must continue after decisions are made to ensure they are implemented and adjusted as required.
- ❖ While policies must be designed to withstand election cycles, actors must maintain their focus on the goal: a carbon neutral energy system by the middle of the century.
- ❖ Taking the UK's climate change law which has withstood changes in government as its cue, Canada would benefit from a federal law that makes reference to targets and establishes institutional reviews and independent oversight to track progress.
- ❖ Canada should institute and the UK should maintain support for a specialist stakeholder group such as the UK's Committee on Climate Change to provide advice on carbon budgets and adaptation.
- ❖ Governments should consider adopting transition policies as part of a wider economic infrastructure programme suited to the requirements of the country.
- ❖ Governments should recognise that a successful transition will in practice take 20 or so years to achieve which in turn necessitates putting down key enablers, particularly in the area of education and generational attitudes, rather than pursuing short term fixes.
- ❖ Governments should support efforts by local government and communities, including indigenous people in Canada, to develop their own clean and affordable energy sources and to break down barriers to downstream initiatives.
- ❖ Governments should ensure that any carbon pricing system is designed to recycle revenue to poorer households in order to offset the regressive nature of such levies.
- ❖ Governments should put in place a schedule of rising carbon prices with as few exemptions as possible.
- ❖ Governments must address institutional barriers that prevent carbon markets from working most efficiently in order to reduce cost of emission reductions.
- ❖ To make carbon pricing politically saleable and ensure fairness, governments should recycle revenue to offset higher energy costs especially to low-income households.
- ❖ Governments should support research and demonstration of CCS technology.



- ❖ Governments should follow up on the work of the FSB Task Force by encouraging their capital markets participants to adopt clear and systematic disclosure regimes.
- ❖ Governments should set a favourable fiscal regime for technology commercialisation and adoption, and maintain a consistent system to give the market an opportunity to respond.
- ❖ Governments should encourage experiments among local governments and financial institutions with innovative financial products, including green bonds and climate performance bonds
- ❖ Governments should investigate the best use of subsidies to encourage the adoption of electric vehicles, perhaps through support for charging networks.
- ❖ Governments should also focus more on enhancing ‘energy productivity’ in transportation and not solely in promoting a specific technology (such as EVs). Subsidies should be targeted and decline as the cost of clean-energy options falls; ‘soft policies’ should be used including access to High Occupancy Vehicle (HOV) Lanes, parking preferences, graduated license fees.
- ❖ Government should work with industry to consistently upgrade building codes and appliance standards in order to drive efficiency gains.
- ❖ Governments and utilities and civil society must find innovative ways to engage with citizens and gain their trust on energy management strategies.
- ❖ Governments and business should establish single-window, “trusted partners” that dispense information and advice without sales pressure.
- ❖ Governments must work with regulators to ensure innovation is not thwarted by outdated regulations.
- ❖ Governments should constantly endeavour to achieve multi-party, multi-stakeholder support for climate action in order to preserve policy measures through election cycles.
- ❖ Governments should continue to work internationally to ensure commitments on transparency and accountability contained in the Paris agreement are fully met.
- ❖ Governments should work with international financial institutions, regulators, banks and other players in the private sector to harmonize climate-related data reporting.
- ❖ Governments should encourage more public support for necessary climate change measures by emphasizing the link with the need to curb toxic emissions of all kinds to improve air quality and safeguard public health, especially among the most vulnerable such as children, the asthmatic and the elderly.
- ❖ Local governments in urban areas should enforce controls on drivers who leave vehicle engines idling. Although some new vehicles have automatic cut-out devices to deal with this problem, the bulk of the British and Canadian vehicle fleet do not. Some cities have begun to levy fines to stop this highly polluting practice.
- ❖ Governments should do more to publicize opportunities for scientific and technological exchanges and joint research promoting the transition to a low-carbon and low-nitrogen economy, where British and Canadian academics and businesses could achieve enhanced cooperation.
- ❖ Greater efforts should be made to explain the reasons for the new environmental policies at primary and secondary school level, so as to diffuse understanding and support for a green approach to all of the coming generations from the earliest realistic age.



APPENDIX I: Agenda of the Briefing Day (Government of Alberta)

“The Transition to a Low-Carbon Economy: Alberta’s Innovation through Implementation”
 Government House :: 12845 - 102 Avenue NW :: Edmonton, Alberta T5N 0M6

THURSDAY, NOVEMBER 24, 2016		ROOM
<ul style="list-style-type: none"> • Master of Ceremonies: Matthew Machielse, Assistant Deputy Minister, Trade and Investment Attraction, Economic Development and Trade • Moderator: Phil Burke, Senior Director, Intergovernmental Relations, Europe, Economic Development and Trade 		
8:30 a.m. to 8:45 a.m.	Welcoming Remarks <i>By The Honourable Shannon Phillips, Minister of Environment and Parks and Minister Responsible for the Climate Change Office</i>	Alberta Room, 3 rd Floor
8:45 a.m. to 9:45 a.m.	Alberta’s Climate Leadership Plan (CLP) <i>By Karen Young, Executive Director, Engagement and Intergovernmental Relations, ACCO</i> How Alberta is Demonstrating Climate Leadership <i>By Simon Dyer, Alberta Associate Regional Director, Pembina Institute</i>	Alberta Room, 3 rd Floor
9:45 a.m. to 10:45 a.m.	Economic Opportunities for Indigenous People in a just transition to a low-carbon economy: A Community Perspective <i>By Councillor Brad Rabbit, Montana First Nation & Ms. Vickie Wetchie, General Manager of Green Arrow Renewable Energy Corporation</i> Transitioning the Labour Force to a Low Carbon Economy <i>By Jim Sandercock, NAIT, Alternative Energy Futures</i>	Alberta Room, 3 rd Floor
10:45 a.m. to 11:10 a.m.	Carbon Pricing Across Canada <i>By Chris Ragan, Chair, Canada’s EcoFiscal Commission</i>	Alberta Room, 3 rd Floor
11:10 a.m. to 12:10 p.m.	Alberta’s Electricity Overview <i>By Christine Lazaruk, Executive Director, Strategy and Integration Branch, Alberta Energy</i> Alberta’s Electricity Sector: Supply/Demand Outlook and Renewable Electricity Program <i>By Nicole LeBlanc, Director of Analytics and Forecasting, Alberta Electricity System Operator</i>	Alberta Room, 3 rd Floor
12:10 p.m. to 12:15 p.m.	Room Transition	



12:15 p.m. to 1:30 p.m.	<p>Luncheon <i>Keynote Address by The Honourable Rachel Notley, Premier of Alberta.</i></p> <p><i>(Introduced by Mr. Eric Denhoff, Deputy Minister, Alberta Climate Change Office)</i></p>	Dining Room, Main Floor
1:30 p.m. to 1:45 p.m.	Networking Break / Room Transition	
1:45 p.m. to 2:15 p.m.	<p>Alberta's Methane Emissions Reduction <i>By Mark Taylor, Vice President, Climate Policy Assurance, Alberta Energy Regulator</i></p>	Alberta Room, 3 rd Floor
2:15 p.m. to 2:45 p.m.	<p>Investing in Technologies for a Low Carbon Future <i>By Steve Macdonald, Chief Executive Officer, Emissions Reduction Alberta (ERA)</i></p>	Alberta Room, 3 rd Floor
2:45 p.m. to 3:00 p.m.	Health Break	Primrose Room, 3 rd Floor
3:00 p.m. to 3:30 p.m.	<p>The Politics of Climate Action: A Federal/Provincial Perspective <i>By Shawn McCarthy, National Correspondent, Globe and Mail</i></p> <p>Balancing a Clean Energy Economy with Responsible Oilsands Development <i>By Jon Mitchell, Vice President, Environment and Sustainability, Cenovus Energy Inc.</i></p>	Alberta Room, 3 rd Floor
3:30 p.m. to 4:00 p.m.	<p>Closing Remarks <i>Philip Peacock, Chair, Canada-United Kingdom Council</i> <i>Mel Cappe, Professor, University of Toronto</i> <i>Matthew Machielse, Assistant Deputy Minister, Trade and Investment Attraction</i></p>	Alberta Room, 3 rd Floor
4:00 p.m.	Adjournment	



APPENDIX II: 2016 CUKC OFFICIAL AGENDA*

Thursday, November 24, 2016

- 8am – 5pm: **Briefing day at the Government House, Edmonton**
- 6-7pm: **Welcome Reception at Fairmont Macdonald Hotel**
- 7-9pm: **Networking Dinner**

Friday, November 25, 2016

- 7:00am-8:00am: Breakfast
- 8:00am-8:15 am: **Opening Remarks by the Hon. Hugh Segal & Mr. Philip Peacock**
- 8:15am-8:30am: **Welcome Remarks from the Hon. Jean Charest (Chair)**
- 8:30am-10:00am [Session 1] **Targets and Goals**
- 10:00-10:30am: Coffee/Tea Break
- 10:30am-12:00pm [Session 2] **Carbon pricing and Eco-fiscal policy**
- 12:00pm-1:00pm: Networking Luncheon
- 1:00-2:30pm [Session 3] **Fossil fuels in a low-carbon economy**
- 2:30-3:00pm: Coffee & Tea Break
- 3:00-4:30pm [Session 4] **Break-out groups**
 - 1) *Mobility Energy*
 - 2) *Financing Policy Initiatives*
 - 3) *Demand Side Policy*
 - 4) *Measurement, Management and Transparency*
- 6-7pm: **Networking Reception**
- 7-9pm: **Alberta Heritage Dinner & Post-Dinner Informal Panel Discussion**

Saturday, November 26, 2016

- 7:00am-8:00am: Breakfast
- 8:00- 9:30am [Session 5] **Reports from break-out groups (by co-chairs)**
- 9:30- 10:00am: Coffee & Tea break
- 10:00 - 11:30am [Session 6] **Building Public and Political Consensus**
- 11:30 am- 12:30pm: Networking Luncheon
- 12:30pm- 1:45pm: **Summary from the Rapporteur & Interactive Discussion**
- 1:45- 2:00pm: **Closing Remarks from the Hon. Jean Charest (Chair)**

**NB: The Chatham House Rule will be in effect for the full duration of the CUKC.*



APPENDIX III: Session overviews

[Session 1] Targets and Goals

The UK has undertaken that its GHG emissions will be 50% below 1990 levels by 2025. Canada is committed to 30% below 2005 levels by 2030. How should these targets condition policy so that they are more than aspirational? What shorter term targets and goals will be needed to realise the ambitious commitments that have been entered into? It will be a formidable challenge to align policy between the many sectors implicated (as well as between domestic and international actors). How is that task best approached? Might the UK approach of 5-yearly ‘carbon budgets’ be worth considering in Canada? The ‘nationally determined contributions’ agreed so far are insufficient to deliver on agreed warming targets. What are the implications for policy? The intention of this session is to set up the parameters of the conversation for the Colloquium.

[Session 2] Carbon Pricing and Eco-Fiscal Policy

What fiscal instruments are the two countries using to price carbon into the economy and are these likely to be effective in achieving the targets? If not, what more may be needed with regard both to taxation and emissions trading? How should sub-national differences be taken account of in the development of a coherent national approach? What did the Working Group on carbon pricing mechanisms established at the First Ministers’ meeting in Vancouver in March recommend and how should that work be carried forward?

[Session 3] Fossil Fuels in a Low Carbon Economy

What will be the place of fossil fuels both during the transition, and in the new equilibrium of a low carbon economy? How will the economies of fossil fuel producing regions (Alberta, Saskatchewan, Newfoundland, Nova Scotia and North Sea/UK Continental Shelf) have to adapt? How are fossil fuels currently subsidised, and how can these subsidies best be phased out? Governments need to work with big business during the transition, drawing on the experience, research and capital available in the private sector. How will it be possible to avoid a confrontational dynamic (of the kind promoted by some NGOs?)

[Session 4] Break-out sessions

BOG1: Mobility Energy

How will mobility, in particular autos, but also trains, planes and ships have to adapt to the low carbon economy? What is the role of public policy in accelerating the decarbonisation of transportation? What balance needs to be struck between infrastructural investment and the new technologies that will thrive when it is in place? How will autonomous vehicles alter the adaptation? How is the public to be brought along?



BOG2: Financing Policy Initiatives

How should R&D, demonstration and deployment of renewables be funded? Do the same considerations apply to other non-traditional technologies (including geoenvironmental initiatives)? What about nuclear? Are innovative financing instruments required, and what has been the UK experience with the Green Investment Bank? What are the respective roles for different levels of government and markets / private financing initiatives in stimulating the transition? How is the public to be brought along?

BOG3: Demand Side Policy

What mechanisms are being used to shift consumption patterns? Are there examples of best practice that might be adopted by either country from the other? Building regulations? Smart metering? Can incentives be devised so that energy companies have an interest in seeking to reduce sales per customer? What is the best approach towards energy intensive sectors such as cement, steel and agriculture, where it may be very difficult to reduce demand?

BOG4: Measurement, Management and Transparency

How will progress be measured and communicated in each country? Is it possible to use transparency to encourage competition and promote best practice, identifying those areas in which there is most opportunity for gain during the transition? What will be the implications of the climate risk disclosure rules being prepared by the Bloomberg Taskforce under G20? Can transparency allow the regulatory and investment communities, as well as the general public, to have a greater real-time sense of where progress is being made, and where it is not?

[Session 5] Reports from break-out sessions

[Session 6] Building Public and Political Consensus

What more could be done to build public consensus for the transformation that is required? Do people accept a responsibility to act despite ‘the tragedy of the commons’? Because the time-lags are so long between what we are doing today and its consequences for the planet, it is necessary to act on the basis of risk rather than scientific certainty. Is this widely understood? What is the role of NGOs in promoting consensus? How should sub-national entities (cities, provinces, etc.) contribute to the necessary consensus? What is the responsibility of individuals?

How is it possible to sustain long-term political commitment when (as is inevitable) the going gets tough, and carbon/climate policy is blamed for rising prices and/or job losses and other economic pain? Has the UK Climate Change Act succeeded in taking the issues out of partisan politics? Has too much weight been placed on GHG reductions to limit global warming and climate change, when there are equally important links to species extinction and other consequences of current policies?



APPENDIX IV: Transcript of Premier Rachel Notley's Keynote Address

THURSDAY, NOV. 24, 2016

GOVERNMENT HOUSE

12845 102 AVE. NW, EDMONTON, ALBERTA

Thank you, and good afternoon, everyone.

It's a pleasure to be here on traditional Treaty Six territory for this important gathering.

Greetings, Consul General [*Caroline Saunders*], government colleagues, distinguished guests.

I'd like to extend a warm Alberta welcome to all the delegates from across Canada and the UK who have travelled long distances to discuss one of the most critical issues of our time.

And thank you to the organizers on both sides of the Atlantic who worked so hard to put this event together, and to the many sponsors who helped make it happen.

This year's Canada-UK colloquium is certainly timely, given the UN Climate Change Conference in Morocco earlier this month.

And, of course, it's a wonderful opportunity to continue the dialogue on such a pressing global issue, following the framework agreement Alberta and the UK signed in March to work together to grow low-carbon economies in both jurisdictions.

These kinds of discussions are a reflection of our collective moral responsibility to limit climate change for the health of future generations. And I'm delighted that this year's colloquium is being held in Alberta.

Our province hasn't always been viewed around the world as leaders on the climate change issue. Frankly, our province's lack of action on this significant challenge – and an undertone of climate change denial in our former policies – hurt us.

Negating scientific evidence about the dangers of climate change – and sticking your head in the sand – has consequences, because the world moves on. If you don't move with it, you become an outlier in an increasingly competitive globalized marketplace.

And it becomes increasingly difficult to grow your economy if the world you're trying to engage with thinks you have no respect for the health of the planet.

Well, things have changed in Alberta.

This province is now playing a leading role in addressing climate change.

Our children and grandchildren will judge us on the actions we take to ensure a better quality of life for all.



Alberta is committed to building a greener, more diversified and sustainable economy, while being a world leader in environmentally responsible energy development.

This morning, you were given an overview of our Climate Leadership Plan. So I won't reiterate what you've already heard. But I do want to emphasize that our plan is one of the most progressive climate frameworks in the world. It provides a roadmap for much of what we are doing to diversify Alberta's economy while helping lower greenhouse gas emissions. And we are confident that it will erase any doubts about Alberta's environmental reputation.

We can't please everyone. But we can do the right things for the right reasons with input from diverse voices in the community.

We consulted widely as we developed our Climate Leadership Plan – because good public policy should be as inclusive as possible.

I know that my Ministers Shannon Phillips, of Environment and Parks, and Margaret McCuaig-Boyd, of Energy, as well as our Climate Leadership panel, worked extremely hard developing the plan.

And we are confident we struck the right balance – because it has broad support in the public, private and non-profit sectors.

I know that such an outcome is hard to envisage. But when you open the door to discussion and listen with respect to all sides, you build bridges, look for realistic solutions, and find consensus.

That is what progressive governments do.

It is how Alberta is fighting climate change, and how we intend to build a sustainable, prosperous economy for the 21st century.

And we are taking careful and strategic action to diversify the economy as we transition to a greener, low-carbon future.

As you heard earlier, our Climate Leadership Plan involves four key actions:

1. A carbon levy, which begins in January;
2. Phasing out coal-fired electricity generation by 2030;
3. Limiting oil sands emissions; and
4. Decreasing methane emissions by 45 per cent from 2014 levels by 2025.

This approach reflects our commitment to addressing climate change while diversifying the economy and developing innovative energy solutions for the 21st century.

Now, while Alberta is committed to taking real, effective action to green the planet, the reality is that global energy demand is expected to rise by 36 per cent over the next two decades.

Although there is greater use of renewables, fossil fuels are still essential to meeting the world's growing energy needs.



Alberta is home to the world's third-largest oil reserves. We are developing them sustainably and responsibly. And we need access to global markets.

I'm talking, of course, about breaking the landlock for Alberta oil that is preventing us from getting full value for our energy exports.

We cannot effectively diversify the economy, create new jobs and build a greener future without the means to fund these measures.

Keep in mind that the energy industry accounts for 20 per cent of Canada's GDP. So the oil and gas industry is vital not only to Alberta's prosperity, but to the economic health of the entire country.

And so we need new pipelines to expand our market access.

My friends, Alberta is one of the most environmentally responsible energy producers in the world.

And in the 18 months since our government was elected, we have shown our commitment to protecting the planet while laying the groundwork for an innovative, sustainable new economy.

In short, new pipelines are essential to our future prosperity. They will spur economic growth, enhance our quality of life, and provide the seed money, if you will, for the economy of the future.

Politicians are often accused of focusing only on the short term – and the next election.

I can tell you that our government's policies and programs are designed for the long term to ensure the well-being of Albertans, Canadians – and our planet – long into the future.

That's why, for instance, we will reinvest revenues from our carbon levy into the economy so we can successfully transition to a low-carbon future.

Some folks have told us that while we should act to achieve a low carbon future we shouldn't be trying to do it now given the state of the economy.

Frankly, opponents of taking action on climate change will always have an argument for why this isn't the right time.

In our case we know the slower economy means families are struggling.

That's why our plan includes a rebate to sixty per cent of Albertans. Families earning 95 thousand dollars a year or less will receive the average cost of the levy back through a rebate.

This will mean they can actually come out ahead if they use less carbon.

We're proud that our carbon levy will help fund initiatives like large-scale renewable energy, green infrastructure, and research and development to grow a cleaner, greener economy.

How do we envision the economy of the future?



It will be one in which, for instance, technological innovation enables Alberta's essential energy sector to thrive while reducing emissions.

And if you think that people with different perspectives can't sit down and examine how to combat climate change, imagine this scenario...

Industry, environmental groups, Indigenous and non-Indigenous communities putting their heads together to devise ways to reduce greenhouse gas emissions.

I'm describing Alberta's Oil Sands Advisory Group.

As you may have heard earlier, this diverse panel was set up in July to advise our government on the oil sands aspects of our Climate Leadership Plan.

Its focus includes recommending how best to invest the carbon levy revenue in new technologies to reduce the emissions intensity of energy production.

Such collaboration truly reflects the community-minded values of Albertans and the determination that built this province into a key economic driver of Canada.

We also envision the economy of the future as one in which the potent combination of: research, innovation, and incentives ...boosts the growth of the renewable energy industry – creating good, green jobs.

And it is one in which every initiative we undertake to help strengthen and diversify the economy starts with the question: Does this contribute to a sustainable, healthy future?

As a matter of fact, Alberta just updated its building code to include energy efficiency improvements that align with our Climate Leadership Plan.

And our government recently announced funding for the installation of solar panels at 36 schools.

These are just a couple of examples of our government's ongoing efforts to build a broader, greener, more resilient economy - one that creates new jobs, opens up exciting opportunities and sustains our quality of life for the long term.

Now, as you might imagine, since the U.S. election, I've been asked many times if a potential change in the American approach signals a potential change in Alberta's approach.

The short answer to this question is no.

Our Climate Leadership Plan is a made-in-Alberta plan and we're committed to implementing it for three reasons.

One is that we believe climate change is real, and we have an obligation to protect our environment, and the health and safety of ourselves and our children.

The second reason is that we have more than one market. It's not just about the United States for us.



We have markets all over the world, and we're looking to grow those markets and develop new ones. Our reputation matters, if we are to be successful in doing this.

Thirdly, we see the Climate Leadership Plan as an important tool to diversify our economy which, for far too long, has been far too dependent on one commodity and one market.

So we have some very compelling reasons to move forward with our plan, and that's exactly what we're going to do.

My government is determined to play a leading role in addressing climate change. It's the right thing to do, and the right thing for Alberta.

We consulted broadly with the community on this issue and we have made a point of seeking advice from a diverse range of voices as we move forward.

That's because climate change affects all of us, and we all have a responsibility to be part of the solution.

Together, we have a tremendous opportunity to shape a healthier, greener world for our children and grandchildren.

Looking at the impressive and diverse expertise in the room today, I am confident we are on the path to a more sustainable future.

So I encourage you to use this time to strengthen our partnerships, and explore new ways we can work together.

Thank you for your commitment to such an important cause. I wish you a productive and enjoyable event.



Appendix V: Summary for the Break-out Session #1 [Mobility Energy]

Context: Significant differences exist in geography, population density, and use of rail when comparing the prospects for mobility energy in Canada and the UK. However, there is a common touching point for both countries in the urban environment, although here also some of the challenges may be different.

Discussion: The discussion centred around eight questions which addressed a range of issues, from targets and incentive schemes to the use of ‘soft’ measures to facilitate change in consumer behaviour. The discussion focused on land transport - aviation and shipping were not addressed. Ambitious or stretch targets play a very important role by incentivising action. Fuel standards already exist and help accelerate desired changes but they alone are not enough; they do have the advantage of being technology neutral and cost effective to implement.

When it comes to decarbonising the sector, there is a need to consider different policies for urban and rural environments. Improvements to public transport are needed but the focus should be on an inter-modal approach. For example, it is important to create incentives that encourage freight to move from road to rail and an inter-modal system could be created where rail is used for long distances between ‘hubs’ and trucks for local delivery. Also, it may be appropriate to incentivise the retirement of old, less efficient vehicles.

Incentives for hybrid-electric and electric vehicles have proved very effective and should continue because adoption will slow, if not stop altogether without such incentives; however, they should decline over time as adoption gathers pace and costs declined.

‘Soft’ incentives encourage changes in behaviour. For example, the fact that electric vehicle owners have access to High Occupancy Vehicle (HOV) lanes in California is a big driver of sales. Other ‘soft’ incentives include free parking, free charging, graduated license fees, preferential road taxes, and differential insurance premiums. ‘Hard’ incentives such as congestion charging should also be considered but with due regard to the needs of the disabled.

It would also be valuable for both countries to share “lessons learned” from driverless cars and of new urban public transport experiments, such as electrified railway where power is only used when the vehicle moves. An overarching ambition should be for a process to reduce delays in delivering new transport infrastructure.

Recommendations

1. Establish a credible independent body to make recommendations on infrastructure taking a holistic approach to energy use.
2. Differentiate between policies for urban and rural environments.
3. Look for opportunities to modal-shift from trucks to rail for freight.
4. Electric and Hybrid Electric car incentives should continue but decline in line with costs.
5. Encourage retirement of older vehicles.
6. Encourage use of new technology to simplify consumer use of public transport.
7. Encourage use of “soft” policies to change consumer behaviour.
8. Create a unified and simpler planning process for low-carbon transportation infrastructure.



APPENDIX V: Summary for the Break-out Session #2 [Financing Policy Initiatives]

Defining the Discussion Topic: Some around the table interpreted “financing policy initiatives” as financing government policy. Others interpreted the discussion as financing policy outcomes. N.B.: There is an enormous amount of private sector financing that can be supported by policy.

Private Financing: Every project has risks (i.e. completion risk). We may be applying policies to the wrong people. E.g.: coal vs. gas prices imposes a risk on a wind producer. First principle: get the underlying market and policy right. We want private finance when it’s going to motivate private actors. Private finance is more expensive when you can borrow at 2%. Should government guarantee 4% given the bond-like nature, versus 9%?

Public Funding: The role of public funding initiatives has much to do with time scales (affecting the weighted cost of capital). Below a *minimum efficient scale* nothing will get started; it’s a license to lose money. The government’s role is to take that risk and be the first mover. Subsidies for EVs are related to the project reaching scale (e.g. scale of the customer base). A leap in battery technology will only come when there are enough people investing in it. On the other hand: what creates incentive for someone to establish a giga-factory is more important. The goal is not to get people to buy in to the notion of batteries but to convince individuals to establish the factory in the first place. Moving from 1 to 5 giga-factories will reduce average cost of production.

- *Example:* 50% of vehicles bought in the UK are fleet vehicles owned by the company for employees, heavily taxed based on CO2 emissions. A small intervention will create a secondary market faster where people get new cars, reducing the capital premium. If there’s no one to price second-hand electric vehicles they cannot be leased. Proposed solution: underwrite the minimum value. When there’s a minimum value you can structure leasing contracts.

Prioritizing Investment: Ms. Saunders is involved in the New Climate Economy, which has produced three reports since 2014 about government impact. Identifies 3 key drivers to shift to a low carbon economy: innovation, investment, and efficiency. Identifies 3 key areas: energy, cities, and land-use. A 3x3 matrix used to prioritize investment and plan for government intervention: energy, cities, and land-use on one hand, and innovation, investment, and efficiency on the other. The matrix is used to observe intersections.

Financing in Middle-Income and Developing Countries: Currency hedging is a problem. E.g. wind is capital-intensive. You’ve taken a 20-year investment and that adds about 30% to the cost per kWh in India.

But that’s a false difference because it’s financed in rupees. In dollar terms the difference is much smaller. Proposal: using aid money to create concessional finance in the developing world and financial hedging instruments to facilitate long-term hedging. Oftentimes it’s not about money, but rather risk capital: you need to reduce the risk of the project and help countries set up credible institutions that will not be targets for patronage.



De-risking Deployment of Carbon Tech: In the UK on general R&D there are 2 mechanisms. The first is cost-based: R&D tax credits that defray costs at an operating level, which can be focused on environmental issues. However, this mechanism is not return-based so may encourage spending rather than action on the issues.

The second are patent-box schemes, wherein a corporation tax is lower on revenue lines and patents are used as proxy for invention. We need to find the environmental equivalent of a patent with an environmental good metric.

The Decentralized Economy: One member called for a forum for small business to obtain financing for environmental initiatives. This speaks to the big changes in the labour market.

Green bonds: Initiatives by stock exchanges such as London and Toronto to raise environmentally friendly finance through so-called “Green Bonds” were to be welcomed. Ethically minded institutional investors were showing a growing appetite for innovative financial instruments of this kind.

PPP and Co-financing: the UK’s extensive experience in Public Private Partnerships, (originally a UK innovation in 1983), could prove an appropriate model for many forms of environmental investment. There need not be a clear line between public and private finance. Co-financing is another example, where the private sector can offer competitively priced finance for short and medium maturities, leaving the longest maturities for public sector finance or guarantees.

Debated point: *“Shouldn’t public financing be focused on public financing goods, rather than on patenting or commercializing?”*

The crucial difference between climate change and most industrial policy is that the latter tries to maximize the wealth of the economy: the government should not pick winners because the economy will pick the most productive. However, climate change requires an immediate solution; you need to pick winners and you need to avoid market failure. We cannot afford policy failure in climate change otherwise we won’t have an economy to worry about. Some breakout session members stated that financing policy initiatives should be purely about risk and incentives.



APPENDIX V: Summary for the Break-out Session #3 [Demand-side Policy]

The session began with the two co-chairs describing the very different energy situations in the United Kingdom and Canada. In the United Kingdom, energy efficiency has never formed part of the public policy discourse. Householders have been left to make their own arrangements and have expressed a preference, for example, for solar panels over insulation, without regard to which is actually the more energy efficient. Smart meters are being rolled out, without any plan for actually using them. Commercial and industrial consumers have been more successful in managing demand.

In Canada, it is extremely hard to generalize about demand management for the country as a whole, since the energy picture varies so widely from province to province. For example, Canada has five provinces where hydro is dominant, three provinces which have or have had nuclear power, and coal is important in four provinces. In the case of Ontario, as in the United Kingdom, demand side management has worked better at the industrial and commercial level than with individual households.

In the discussion which followed, the focus was on households and how greater conservation and efficiencies could be achieved, since this seemed to be a common challenge in both countries.

The group began by identifying communities which have been successful in introducing household conservation and energy efficiency programs: the Scottish island of Eigg, the town of Fintry near Stirling, and communities in Germany and Denmark. The common features for these successful projects were community engagement and involvement, a sense of pride and ownership, and, most of all, a sense of trust in the process and in the institutions delivering the service. It was crucial to present local energy-saving options with varying price-tags to the community so that citizens felt truly empowered to make decisions.

Successful programs resulted from being straight with the population and not overpromising results. Simplicity of design was important. Another feature was that good programs harnessed price signals to produce creative but simple and understandable financing arrangements rather than offering rebates.

The group was left with a final question: how could programs which had been successful in smaller communities with high levels of social capital be scaled up to cities?



APPENDIX V: Summary for the Break-out Session #4

[Measurement, Management & Transparency]

The challenges of securing valid and reliable measures that reflect our transition to a cleaner energy economy became amply clear in this dialogue session. With a variety of audiences to satisfy including but not limited to capital market managers, industry leaders, the UNFCCC, ordinary citizens and non-governmental organizations, no real convergence was obtained.

In part, the dilemma is couched in the lack of a compelling vision of energy democracy, security, ecological integrity, efficient design and inclusive prosperity. In popular discourse, the adjectives ‘low carbon’ have not enrolled enough inspiration and while parts per million of CO₂ may work for some audiences; its heuristic value is limited.

“If we don’t paint a picture of the future that is attractive, then people will not want to join us on the journey”

Still, some initiatives are of interest that have a more enrolling message such as the Oberlin Partnership. Also worthy of consideration and evolution toward a compelling climate action story and policy data base included:

- Sustainable Development Goals;
- Genuine Progress Indicators;
- Future Fit Business Benchmark;
- Green Jobs;
- Bloomberg Task Force on Climate Resilient Financial Disclosure;
- Sustainable, Responsible and Impact trends;
- Environmental, Social and Corporate Governance;
- Strategic Investors Initiative;
- Wealth adjusted GDP;
- Gross National Happiness (e.g. Bhutan, Denmark);
- Transition Pathway Initiative.

And others need bolstering in scale or quality:

- Macroeconomic indicators, particularly prosperity and stability measures, asset valuation and how money is moving in the markets;
- Profiles of *all* greenhouse gases and not just carbon;
- The cost of doing nothing (e.g. insurance rates and claims) with simple framing of climate risks and the impact on human lives
- Transparency in supply chain emissions profiles;
- UNFCCC emissions data; and,
- Smart metering (e.g. Opower), footprint labelling and other measures with demonstrated impact on behaviour.



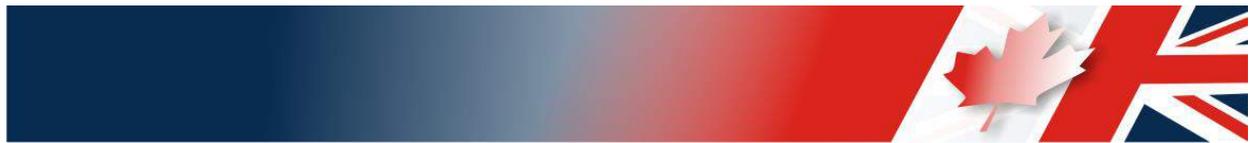
Popularizing the climate conversation has to extend beyond COP cycles to engage smaller communities. Jobs, waste management opportunities and the psychological social pressures related to the climate discourse would all have significant public appeal. Similarly, attention must be paid to the right messenger for the message. In the end, the opportunities that the climate challenge presents have not been communicated positively and effectively at all levels (e.g. community and regional levels)

Canada is still struggling from a data drought and it might take time for us to catch up with the UK's Office of Climate Change that is taking a whole of government approach to developing solid information for decision making. In any case, it is clear that our messages must be tailored to the audience, convey opportunity and find value for scientific, financial, public audiences in a way that illuminates promising practices at subnational levels yet creates solid evidence for national and international decision making.



APPENDIX VII: 2016 CUKC Participants - The Canadian Delegation

- **James Auld**, Senior Manager, Corporate Development, Canadian National Railway
- **Elizabeth Beale**, Commissioner, Canada's Ecofiscal Commission
- **Grant Bishop**, Associate Consultant, McKinsey & Company
- **Jennifer Bonder**, Ph.D. Candidate, History Department, University of Toronto
- **Dr. Paul Boothe**, Managing Director, Trillium Network for Advanced Manufacturing
- **Phil Burke**, Senior Director, Intergovernmental Relations, Europe, Middle East, India and Africa, Alberta Economic Development and Trade
- **Dr. Mel Cappe**, School of Public Policy & Governance, University of Toronto
- **Karen Clarke-Whistler**, Chief Environment Officer, TD Canada
- **The Hon. Jean Charest**, Former Premier of Quebec & Deputy Prime Minister
- **Dr. Steve Dew**, Provost & Vice-President (Academic), University of Alberta
- **Linda Duncan**, Member of Parliament (NDP), Edmonton-Strathcona, Canada
- **The Hon. John Godfrey**, Special Advisor for Climate Change, Government of Ontario
- **Dr. Larry Kostiuk**, Associate Vice-President (Research), University of Alberta
- **Brian Livingston**, Executive Fellow School, Public Policy University of Calgary
- **Shawn McCarthy**, National correspondent, *The Globe & Mail*
- **Velma McColl**, Managing Principal – Ottawa, Earnscliffe Strategy Group
- **Dan McDougall**, Assistant Deputy Minister, Environment Canada
- **Jon Mitchell**, VP of Environment & Sustainability, Cenovus
- **Prof. Kim Nossal**, Professor, Centre for International and Defence Policy, Queen's University
- **Prof. Nicholas Rivers**, Institute of the Environment, University of Ottawa
- **Tina J. Park**, Executive Director, Canadian Centre for the Responsibility to Protect
- **David Paterson**, Vice President, Corporate & Environmental Affairs, General Motors
- **Bianca Ponziani**, Junior Fellow, Massey College
- **Dr. Chris Ragan**, Chair, Canada's Ecofiscal Commission
- **Kim Scott**, Director of Research & Policy Coordination, Assembly of First Nations
- **Prof. Stephen Scharper**, School of Environment, University of Toronto
- **The Hon. Hugh Segal**, Master of Massey College
- **Patrick Steadman**, Junior Fellow, Massey College
- **Arlene Strom**, VP Sustainability & Communications, Suncor Energy Inc.
- **Scott Vaughan**, President and CEO, International Institute for Sustainable Development
- **Karen Young**, Executive Director, Engagement and Intergovernmental Relations, Alberta Climate Change Office



APPENDIX VII: 2016 CUKC Participants – The British Delegation

- **Dr. Chris Anastasi**, Special Adviser, Engie
- **Tom Burke**, Chair e3g
- **Anthony Cary**, Hon. President, CUKC
- **Anjou Dargar**, Head of Public Policy & Emerging Markets, Thomson Reuters
- **James Donald**, Graduate Research Assistant, University of Victoria
- **Jonathan Flint**, Former CEO, Oxford Instruments
- **Lucien Georgeson**, Post-graduate student, UCL
- **Robert Gould**, Head of Programme Management Office, International Climate and Energy Directorate
- **Tom Heap**, Journalist, BBC News
- **Emma Howard-Boyd**, Chair, UK Environmental Agency & Vice-Chair, Future Cities Catapult
- **Zoe Knight**, Head of Climate Change Centre of Excellence, HSBC Investment Bank
- **Dr. Alastair Martin**, Founder & Chief Strategy Officer, Flexitricity Ltd.
- **Nicholas Maclean**, CUKC Member
- **Sir Mark Moody-Stuart**, Chair of Hermes Equity Ownership Services & former Chair of Shell and Director of Accenture
- **David Nelson**, Executive Director, Energy Finance, Climate Policy Initiative
- **Jeremy Nicholson**, Director, Energy Intensive Users' Group
- **Prof. Matthew Paterson**, School of Social Sciences, University of Manchester
- **Philip Peacock**, Chair, CUKC
- **Adrian Rimmer**, CEO European Environmental Markets
- **Caroline Saunders**, British Consul General, Calgary
- **Dame Fiona Woolf**, DBE DL Partner CMS Cameron McKenna, and former Lord Mayor of the City of London



Appendix IX: List of co-hosts & co-sponsors

(Listed alphabetically)

Alberta Government
Canada's Ecofiscal Commission
Canada - United Kingdom Council
Canadian National (CN)
Centre for European, Russian and Eurasian Studies at Munk School of Global Affairs
Dadco
Environment Canada
Foreign & Commonwealth Office
Global Affairs Canada
GM Canada
Massey College
McCord Travel Management
Munk School of Global Affairs at the University of Toronto
School of Public Policy and Governance at the University of Toronto
Suncor Energy
TD Canada Trust
Thomson Reuters
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