

Commission for Environmental Cooperation (CEC) of North America

Joint Public Advisory Committee Regular Session 08-02 North America 2030: An Environmental Outlook

Government Conference Centre 2 Rideau St Ottawa, ON

Summary Record¹

The Joint Public Advisory Committee (JPAC) of the Commission for Environmental Cooperation (CEC) of North America held an environmental outlook conference on 25 June 2008, and held its second regular session on 26 June 2008. The main objective of the conference was to identify and assess the major trends that will have an impact on North America's shared environment in the coming decades.

This Summary Record reports on each agenda item, records all decisions made by the Committee and identifies action items and responsibilities. (See Annex A for the agenda, Annex B for the list of participants and Annex C for copies of the panel presentations).

Previous summary records, advice from JPAC to Council and other JPAC-related documents may be obtained from the JPAC Liaison Officer or through the CEC's website at http://www.cec.org>.

Outlook Conference, 25 June 2008

Welcome and Opening Remarks by Jane Gardner, JPAC Chair

The JPAC Chair welcomed the participants and gave a brief overview of the structure and function of the Joint Public Advisory Committee. She also mentioned that the entire conference would be broadcast live via webcast in English, French, and Spanish, making the session accessible to anyone with an internet connection.

Adrián Vázquez, CEC Executive Director

Mr. Vázquez explained that the purpose of the conference was to look forward to 2030 to predict the state of our environment and to identify action that must be taken now to preserve it. He mentioned the broad uncertainty inherent in environmental forecasts and enumerated a number of environmental indicators from 1986 to illustrate how much can change in 22 years. He stressed the connection between environmental wellbeing and socio-economic stability, and

¹ Disclaimer: Readers should be advised that although this summary was prepared with care and has been approved by JPAC members, it has not been reviewed nor approved by the interveners and therefore may not accurately reflect their statements.

concluded by reiterating the message that the future of our environment is not pre-ordained. The health of our environment in the coming decades will be largely dependent on the policy decisions we set today in areas like energy use, urban density, water pricing and product design.

Thomas Homer-Dixon, George Ignatieff Chair of Peace and Conflict Studies, Trudeau Centre for Peace and Conflict Studies, University of Toronto

Mr. Homer-Dixon said that he wanted to put the drivers of environmental change into a larger context to broaden the purview of the conference. 2030 is an ambitious goal, but we should be looking even further into the future. The decisions we're making today will have strong impacts for centuries because of the enormous time lag inherent in systems like the global climate. He also pointed out the significant gap in knowledge between the academic community and the general public, and he said that far too often, policy makers' knowledge most closely resembles that of the ill-informed public.

He opened his discussion of the growing environmental crisis by explaining the key concepts of convergence, synergy, and complexity. Convergence refers to the threat of multiple stresses (population growth, environmental damage, energy scarcity, etc.) developing simultaneously. As the number and intensity of these stresses increase, there is a similar increase in the chance that our coping mechanisms will fail. These stresses often exhibit synergy, meaning that they reinforce each other. Population growth, for example, increases the consumption of resources, thereby augmenting the rate of resource depletion and environmental damage. Finally, he explained that we tend to view the world as being made up of machines, which exhibit predictable behavior that can be fully understood and explained. More often, however, the world is made up of complex systems, which have multiple equilibria and exhibit highly unpredictable behavior. Our mechanistic ontology has contributed to a strong faith in the sustainable management of natural resources, as well as the neoclassical economic belief that resource availability is a linear function of price.

Mr. Homer-Dixon then applied these concepts to the issue of climate change. This particular problem is characterized by strong positive feedbacks in areas like carbon sinks and melting sea ice. These feedback loops are self-reinforcing and fundamentally destabilizing. Projections for future warming cover quite a broad range of scenarios, but if anything, we have underestimated the rate of change. There is general agreement on a temperature increase of 0.8–1°C to 2029, but trends farther in the future will be strongly affected by policy changes today.

He then turned to the subject of energy, saying that we are probably near the peak global output of conventional oil. The energy cost of oil is rising quickly, which appears to be driving a shift toward more carbon-intensive fuels. We face a significantly reduced energy return on investment for many prospective energy sources, making easily extractable options like coal increasingly attractive, despite the associated environmental damage. Changing trends in energy sources and levels of consumption have caused global fossil fuel emissions to exceed even the most pessimistic projections in recent years, and new data also show that carbon remains in the atmosphere for much longer than we'd originally thought. Many scientists believe that we have already exceeded a safe concentration of carbon in the atmosphere, and they are now calling for a complete elimination of carbon emissions as soon as possible. Mr. Homer-Dixon noted that our ramp-down rate will ultimately depend on our perception of the risks of climate change. A perception of manageable risks will lead to very different solutions from a perception of catastrophic ones.

We won't be able to adapt to a world of unconstrained carbon emissions, so we need a mix of adaptation and mitigation measures. Most importantly, Mr. Homer-Dixon advocates placing a significant price on carbon that will eventually exceed \$100/ton. He suggested an array of other solutions, ranging from the conventional to the radical, including the use of efficiency and conservation measures, renewable energy, coal with carbon capture and storage, nuclear power, unconventional technologies like underground coal gasification or stratospheric windmills, atmospheric carbon capture, and geo-engineering. He also referred to a shift away from the traditional definition of societal growth. As the global economy and population continue to expand, we will eventually have to acknowledge the fact that we live on a planet of finite resources. Mr. Homer-Dixon stressed that we need to start working on these problems right away. If we continue to delay as much as we have on climate change so far, it may be too late to stave off catastrophic effects.

Questions and comments

- The climate has been changing all throughout the history of the planet. Can you address the question of uncertainty with regard to humankind's influence in current trends?
 - Response: The climate is subject to natural variations, but it's been changing much faster than it ever has before. The anthropogenic contribution to climate change is now established fact. The rate of change is the critical factor here because all human institutions are adapted to the climate as it used to be, and we will have to adjust everything (including long-term or even permanent features of our infrastructure) to a rapidly changing climate.
- There is a consistent gap between the amount of environmental protection demanded by citizens and the amount of protection offered by their supposedly democratic governments. Why is this and what can we do to address it?
 - Response: Our hierarchical democracy has not been very effective at finding creative solutions. In times of crisis, we tend to hand over a lot of power to a centralized authority, so if we perceive the environment as a critical threat, then we may see a trend toward more authoritarian environmental governance. This is a reactive measure, however. We should strive to use democratic, distributive governance to solve these problems before they become crises.
- Discuss the impact of rising energy prices, particularly in terms of their effect on global and domestic inequality.
 - Response: We should expect to see a reduction of high-intensity suburban living, which will increase urban agglomeration, and we are already seeing a reduction in economic growth, which has helped to smooth over class conflict in the past. We will need large-scale resource and technology transfers from rich to poor, both in terms of individuals and nations, if we are to achieve equality. The less fortunate will need assistance maintaining their standard of living in a world of rising energy prices, and they will also need financial backing if they are to implement expensive, environmentally friendly technologies and processes.

- What are we doing to prepare for regional variations in climate change?
 - Response: We're shifting our focus away from regional variability and more toward extreme weather incidents, which have much larger implications for the economy and human safety. The frequency and intensity of these events have been increasing, and we need to increase our resiliency.

A copy of the presentation can be found at the following link: http://www.cec.org/outlook/>.

Rob Visser, Deputy Director, OECD Environment Directorate

Mr. Visser's talk focused on the Organisation for Economic Co-operation and Development (OECD) Environmental Outlook, which was created to help local decision-makers with short-term mandates by providing long-term and global projections, raise awareness of the urgency of environmental challenges, and provide potential policy solutions. The Outlook covers economic trends, environmental consequences, and policy solutions. It also identifies four priority areas for urgent action (climate change, biodiversity loss, water scarcity, and the health impacts of environmental pollution), and Mr. Visser discussed each of them in turn.

The "business as usual" projections for climate change display a continued rise in emissions, particularly among developing nations. The policy solutions are available and affordable, however, especially if we work with all major emitters. World GDP is expected to rise by 100% by 2030, and implementing a plan to cap atmospheric carbon at 450 ppm would cost only 0.5% of that growth. Specific policy instruments include putting a price on greenhouse gas emissions, promoting eco-innovation and research, and supporting developing countries in their efforts to grow sustainably.

In terms of biodiversity, further losses are expected, due primarily to agriculture and climate change. To combat this, the OECD Outlook suggests measures like the proper pricing of resources, the assignment of property rights, and educational programs to better integrate biodiversity concepts into agriculture, resource extraction, infrastructure decisions, etc.

Water scarcity is expected to become an increasingly prevalent problem in the coming decades, potentially affecting as much as half the population in some regions. We can mitigate this trend with water pricing measures that promote efficient use and motivate technological improvements, as well as with increased support for water supply and sanitation infrastructure and better practices in agriculture and industry.

Urban air pollution is likely to emerge as one of the major threats to environmental health, due to aging populations and increased urbanization. OECD countries currently devote 6–16% of their GDP to health costs, but if they spent this money upstream on environmental problems like air and water quality, they could significantly reduce downstream health expenditures. Possible market-based solutions include green taxes, emissions trading, prices on pollutants, the removal of harmful subsidies, etc. Mr. Visser noted that we should focus on putting a price on environmental "bads" rather than subsidizing environmental "goods."

He then presented an example policy package that would reduce agricultural subsidies, tighten air quality regulations, and introduce a carbon tax. It would only cost 1% of GDP growth to 2030, and would reduce key air pollutants by one-third, curtail the growth of greenhouse gas emissions, and significantly improve air and water quality. The environment ministers can't accomplish a plan like this alone, however; they need the support of finance and economy ministries, who provide financial backing and guide structural economic shifts, sectoral ministries, who institute specific policy reform, and other major stakeholders like business owners, trade unions, and NGOs.

Mr. Visser stressed the fact that timing is critical. There are currently huge investment opportunities in rapidly growing economies in the developing world, and we can avoid irreversible damage to the environment if we help them invest in sustainable long-term infrastructure now. Environmental policy solutions are achievable if we start early, use least-cost policies, and engage global cooperation, and they are affordable when put in the context of expected economic growth and when compared to the high cost of inaction, both now and for future generations.

Questions and comments

- One of the suggested solutions was eco-labeling, but that seems like a way to advertize specific products rather than a way to achieve broad change.
 - Response: Eco-labeling provides consumers with more information about their products. If consumers start to demand certified environmentally friendly products, more companies will start producing them.
- Governments have short-term electoral mandates, so how can we persuade them to act now in the interests of long-term environmental preservation?
 - Response: We must emphasize the importance of the future, helping politicians to educate voters on the necessity of bearing relatively small costs today to avoid catastrophic losses in the future.
- The OECD policy solutions emphasize market-based initiatives, but what about democratic environmental law, which can be much more broad and enforceable?
 - Response: Market-based initiatives can be very efficient and are much easier to implement. Binding policy is very important, but the democratic process can be slow and does not always produce optimal results.
- Could you elaborate on the OECD's proposed solutions for water scarcity?
 - Response: It comes down to promoting more efficient water use and making sure we keep water needs in mind when choosing sites for agricultural or constructional development.

A copy of the presentation can be found at the following link: http://www.cec.org/outlook/>.

PANEL I: CONTINUED GROWTH AND INTEGRATION OF NORTH AMERICAN SOCIETIES

Ellen Kraly, William R. Kenan Jr. Professor of Geography; Director of the Upstate Institute, Colgate University

All three countries are expected to see a demographic shift that results in a more balanced distribution between the different age groups, as well as an increase in urbanization as people shift toward major metropolitan centers. North America attracts migrants from all around the world, and communities are affected in different ways by the arrival of permanent emigrants, short-term migrants who arrive as students or temporary workers, and refugees.

Isabel Studer, Director of the Center for Dialogue and Analysis on North America, *Instituto Technológico y de Estudias Superiores de Monterrey*

Dr. Studer discussed the ever increasing integration among Canada, Mexico, and the United States. Unlike Europe, North America is unlikely to develop a transnational government to guide the integration process, which puts greater emphasis on national governments, businesses, NGOs, and intraregional migration. This results in a more chaotic de facto integration process rather than a formalized system like the European Union. North America has already achieved a high degree of integration, but as of yet, there has been no crisis to force the three governments to officially institutionalize the process.

Dr. Studer then identified three factors that will have an impact on the future of North American integration. First of all, the three governments might use regional integration to defend themselves against increasing international competition, particularly from rising economic superpowers like China and India. Second, demographic changes may prompt increased migration, most noticeably to fill shortages in the labor market caused by an aging population. Finally, efforts by the national governments to coordinate their policies could substantially bolster the integration process.

Rodolfo Lacy, Research coordinator of energy and environment projects, Mario Molina Center for Strategic Studies on Energy and the Environment

Mr. Lacy discussed transportation's impact on the environment. The transportation sector represents over 20% of global carbon emissions, and the combustion of fossil fuels also generates black carbon particles and increases ground-level ozone, both of which are harmful to human health. Megacities play a major role because they consume so much energy, and they are all interlinked with highways, waterways, and airways.

We have many opportunities for environmentally sound changes in transportation infrastructure, as well as in decisions about spatial planning and land use. Areas for improvement include a reduction in total transportation, a shift to cleaner travel modes, an improvement in vehicle efficiency, alternative transportation fuels like electricity, hydrogen, or biofuels, and fairer technology across North America.

Martin Adelaar, Principal, Marbek Resource Consultants, Ltd.

Mr. Adelaar focused on the environmental impact of the built environment, which consists of all the elements that make up how we live and work (dwellings, commercial buildings, transportation, neighborhood infrastructure, etc.). He outlined the lifecycle of the built environment, from the extraction of raw materials through to the end of life when it is repaired and then eventually replaced. He noted that the operating stage in the middle of the lifecycle accounts for the vast majority of environmental impacts, with dwellings in the outer suburbs creating an impact almost twice as large as their urban counterparts.

Mr. Adelaar then discussed the AIA-RAIC 2030 Challenge of achieving a carbon-neutral endstate for newly constructed buildings by 2030 as well as substantial carbon reductions in existing buildings. It is possible to meet and even exceed this target using existing technologies, so it is a reasonable goal. We must simply make sure not to pass up any opportunities for sustainable development; we have to build new buildings, so we should do our utmost to ensure they are designed to be as energy efficient as possible.

Questions and comments

- Our discussion of climate change tends to focus primarily on carbon, leaving out greenhouse gases like methane and ethane. Not only do they contribute to climate change far more than carbon dioxide, but recapturing them with existing technology would allow us to use them as natural gas for our own energy consumption.
- Will further integration of the three North American nations have an effect on our response to climate change?
 - The integration process can be harnessed to produce strict environmental standards for industry across the three countries.

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PANEL II: GLOBAL ENVIRONMENTAL CHANGE; THE CHALLENGE FOR NORTH AMERICA

Gordon McBean, Professor of Geography, University of Western Ontario; Chair for Policy at the Institute for Catastrophic Loss Reduction

Not only is the climate changing, but it is changing at an increasingly rapid rate. We are already committed to a set rate of warming through 2030, but trends afterward will depend on our emissions in coming years. There are currently three main avenues for us to pursue: we must reduce emissions, implement adaptation strategies, and reduce scientific uncertainty.

In North America, climate change will most likely bring warmer winters with increased precipitation and hotter summers with decreased precipitation. The Arctic is one of the most vulnerable regions on the planet, and climate change has already started to take its toll on local ecosystems and human communities. Of particular concern are the permafrost layer and the hydrology of the region, which could play into positive feedback loops and increase the rate of ecosystem change.

Climate change will increasingly affect our socioeconomic wellbeing through effects like rising sea levels, extreme weather events, and heat spells. If anything, our predictions are probably overly optimistic, both in terms of the intensity of anticipated effects and what a safe level of warming would be, so we must prepare ourselves for an uncertain future. We should invest now to prevent much greater losses in the future.

Victor Magaña, Professor of Atmospheric Science; Head of the Department of Meteorology, Center of Atmospheric Science, National Autonomous University of Mexico (UNAM); and member of the IPCC

Dr. Magaña's presentation focused on Mexico, which is just as vulnerable to climate change as Canada and the United States, despite its lower level of industrialization and urbanization. We are already seeing some effects, including particularly hot summers with consequences for health, soil moisture, and forest wellbeing. One of the most critical issues for Mexico will be the availability of water; increasingly frequent heat waves simultaneously reduce the availability of water and drive up consumption. This problem will be particularly acute in the densely populated central region as well as the highly agricultural northern region of the country.

Other effects of climate change include damage to wetlands, one of the country's greatest regions of biodiversity, and an increase in the frequency and severity of extreme weather events like rainstorms and hurricanes, soil erosion, and mud slides. Repairing the damage from climate change–induced effects is incredibly expensive, and some damage cannot be undone. Therefore, we must shift from reactive policy to preventive policy. There is still much uncertainty as to the repercussions of climate change, so we need to galvanize our efforts to estimate the socioeconomic and ecosystem risks. We must also engage in more region-specific analyses so as to design fully informed and locally appropriate adaptation strategies.

Jorge Soberón, Professor at the Division of Ornithology, University of Kansas

Dr. Soberón talked about the effect climate change will have on biodiversity in North America, which is one of the richest regions of biodiversity in the world. In the north, ice will melt and the tundra ecosystem will be radically disrupted, while in the south, everything will likely get hotter and dryer. Climate change will affect the distribution of species across the landscape, including many endangered or invasive species, as well as species with great socioeconomic importance like pollinators, vectors of disease, and agricultural pests.

We can predict the effects of climate change to a certain extent if we devote sufficient efforts and resources to ecological niche modeling, but there are hundreds of millions of data records that still need to be compiled and digitized. We can expedite the process by sharing data records among the three countries, but this requires active participation from everyone because missing records leave the database incomplete.

There are three types of action we can take: advocacy, mitigation, and adaptation. There is a multiplicity of stakeholders among the public and in various levels of government, however, and the issue is complicated still further by the different systems of property rights, land use regimes, and legal frameworks.

Large uncertainties remain in our discussions of climate change, and any errors in our research will build on each other. Incorporating this information with complex economic or social data compounds the problem still further. With this in mind, we must maximize our adaptability by incorporating a tremendous amount of flexibility into our institutions, including the structure of our landscapes and our agricultural methods. We can't assume that any one solution will prove lasting or effective, and we will need to engage in constant monitoring to determine how well our current policies are working.

Climate change will affect all the ecosystems in North America, and we must be prepared to deal with these changes in each nation. Preserving biodiversity is important because it safeguards genetic diversity and is intimately linked with human welfare. Shared ecosystems and migratory species mean that whatever policies one country decides to implement will affect its neighbors, so we must work together.

Kristie L. Ebi, Independent consultant (ESS, LLC), and a lead author for the human health chapter of the IPCC Fourth Assessment Report

Health impacts permeate every discussion of climate change, ranging from direct effects like heat waves and extreme weather events to more indirect effects like an increase in the reproduction of dangerous pathogens, the spread of vector-borne diseases, heightened water scarcity, and increased susceptibility to airborne pollution. The magnitude of these health impacts ultimately depends on geographic factors, innate biological sensitivity, and socioeconomic factors, which may increase the likelihood of exposure to harmful agents or reduce the ability to adapt. There may be some health benefits resulting from a changed distribution pattern for vector-borne diseases and a reduction in cold-related deaths, but the overall impacts of climate change are expected to be overwhelmingly negative, encompassing consequences like malnutrition and diarrheal diseases in addition to those already mentioned.

Extreme weather events have been increasing in frequency, intensity, and duration, but recent incidents have proven that we are ill-prepared even for non-extreme events. We drag our feet when it comes to paying the costs of heightened preventive standards, even though repairing the damage afterward always ends up being much more expensive.

By and large, health officers agree that climate change is and will continue to be a serious problem, but most of them do not feel prepared to address the associated health implications. We have a variety of health assessment programs, but we need to start incorporating the effects of climate change into our models and forecasts. We must evaluate the effects ahead of time and set up monitoring and evaluation processes when new policies are set in motion, to avoid being caught unaware. We must also increase the resilience of our public health systems, providing uniform data indicators and data systems, creating decision support tools for climate change and health, and explicitly incorporating climate change into transboundary cooperation for air toxics and vector-borne diseases.

Questions and comments

- From the panelists: We need to acknowledge our uncertainty when it comes to climate change, but we also shouldn't ignore the knowledge we already have. It's a very complicated issue, but we know enough to make a relatively informed decision about immediate actions that urgently need to be taken. We just need to make sure that our systems are flexible so we can continue to update them as our knowledge improves.
- What effect will climate change have on biodiversity conservation strategies based on protected areas?
 - Response: Protected areas aren't so much a concern as non-protected spaces with a lot of biodiversity. Policies on forest management and land conservation are

going to have a much greater impact than changes in the regulation of protected spaces.

- We have heard a lot about how climate change will affect specific sectors, but this is a broad issue that will have synergistic impacts on all areas. Can you offer any more holistic suggestions?
 - Response: The complexity of the problem necessitates a diversity of responses, and we need a lot of specific research and targeted responses within each sector. We will also need a more integrated, holistic response, which will require a great deal of collaboration and networking, and hence a lot of financial backing. Academia tends to organize itself into enclaves of specialists, so we need to promote efforts that bring together interdisciplinary groups of experts to pool information and share strategies. We should stop dealing with economic, health, and environmental issues one by one and find integrated solutions that address several existing and potential problems at once.
- Oil is running out, coal is bad for the environment, and bio-fuels contribute to the global food crisis. None of the panelists today has addressed the need to drastically alter our lifestyle so as to reduce consumption, which I think is the simplest and most effective solution.

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PANEL III: ENVIRONMENTAL SECURITY

Hamid Arastoopour, Henry R. Linden Professor of Energy, Department of Chemical and Biological Engineering, Illinois Institute of Technology (IIT)

Dr. Astaroopour mentioned that his presentation would center on providing a positive outlook by focusing on possible solutions to our energy difficulties rather than belaboring our current problems. Our mission is to improve the quality of life while preserving our natural resources and the environment for future generations, and this effort ties in the important issues of the economy, the environment, and national security.

Current trends indicate continued increases in population growth, per capita energy consumption, the depletion of oil and gas resources, and public concern over environmental impacts. We must engage in a least-cost strategy to find reliable, secure, and affordable sources of energy, improve energy efficiency and conservation, continue decarbonization to stave off the worst effects of climate change, and minimize wastes and pollutants.

In the short term, we can focus on providing energy from alternative sources like nuclear power, wind, clean coal, biofuels, and waste materials. We should use available carbon sequestration technology, and enhance the efficiency of transportation vehicles, as well as all systems for converting, distributing, and using energy. Sustainable buildings offer great potential because wind and solar energy can be generated at the point of use, reducing the monetary and energy costs associated with transmission infrastructure.

Education and outreach are very important because these strategies are only effective if they are widely employed. We must get the message out to everyone, from members of academia to children in elementary schools. Everyone needs to know how these new technologies work and how effective they really are.

In the long term, we will need to derive most of our energy from renewable sources. Hydrogen will likely be the dominant transportation fuel, and we must strive toward sustainable cities that use environmentally friendly materials and place a heavy focus on recycling. These efforts must be complimented by comprehensive energy and environmental policies.

Jatin Nathwani, Ontario Research Chair in Public Policy and Sustainable Energy Management; Executive Director, Waterloo Institute for Sustainable Energy (WISE), University of Waterloo

There are currently three fundamental energy challenges: dependence on liquid fuels for transport, damage to the global environment, and lack of access to modern energy services by the world's poor. Mr. Nathwani addressed the first two in his presentation, with specific reference to the transportation sector. Our current upward trends in energy consumption exhibit a tenacity that is difficult to overcome. So far, improvements in fuel efficiency have not proven very effective at reducing consumption or lowering emissions because they tend to be more expensive. Unless we make them legally mandated or reduce their cost, they may not provide a very effective answer.

If we can't reduce our consumption of gasoline with higher fuel efficiency, then an alternative solution would be a paradigm shift toward an entirely new source of energy, like electricity. We need a lot of electricity at peak hours, but we don't use very much during off-peak hours, so we could potentially use those hours to charge electric cars. Historically, we have often shifted from primary fuels to electricity, and pricing carbon will only strengthen this trend. Overall, the convergence of the power and transportation sectors is a promising path toward enhanced energy security, cleaner air, sustainable development, and efficient infrastructure utilization.

Deborah Popper, Visiting lecturer, Princeton Environmental Institute (PEI), Princeton University

Mrs. Popper began with a brief overview of historical trends in North American agriculture, including the confinement of animals, which deprives the fields of their manure, the overuse of water, which reduces water tables, and the use of artificial pesticides and fertilizers. By way of contrast, she explained the concept of the Buffalo Commons, which promotes sustainable agriculture in the Great Plains using appropriate measures designed specifically for local ecosystems.

She then presented three potential approaches to agriculture, all of which will continue to be present to varying degrees. The "business as usual" scenario is characterized by large-scale energy and chemical use and is driven by markets and government regulation. This style of agriculture will be greatly affected by climate change, and its harmful environmental effects could be reduced if we start to factor ecosystem services into our cost-benefit analysis. The "Buffalo Commons" scenario is based on small-scale entrepreneurship that caters to the growing demand for localized, sustainable agriculture. It focuses on native species and crops with low

inputs, and likely involves collaborations between public, private, and not-for-profit organizations. Finally, the "between North America's arteries" scenario involves heavy investment and development along the region's edges driven by trade and coastal global warming threats. It has possibilities for ignoring, improving, or exploiting the grasslands between the major corridors of transportation.

Important policy issues to consider for the future include water availability and use, especially as climate change worsens these conditions, rising energy costs, which make intensive agriculture and its attendant transportation networks increasingly expensive, energy development projects, and food subsidies. Foods produced through low efficiency in nutrition conversion, like red meat, remain popular because of subsidies, but there have been increases both in international demand for these foods and in the calls to end subsidies.

Sylvain Charlebois, Associate Dean, Kenneth Levene Graduate School of Business, University of Regina

The United States and Canada waste billions of tons of food while millions of people in the southern hemisphere live in conditions of abject poverty and starvation, illustrating the dichotomy between food issues in the two regions. In the northern hemisphere, we tend to suffer from agricultural myopia: we subsidize certain foods without considering the macro-effects for the economy or domestic diet. As has been mentioned, water will continue to be a pressing issue. Mounting consumer pressure for animal rights ends up raising food prices, as does speculation on the international market. Demand for local consumption may shift patterns of production, especially since current highways and corridors are proving inadequate for the transportation of food. Finally, food safety is becoming an increasingly prevalent issue as it becomes clear that our current security systems are woefully inadequate at identifying and preventing contamination. Food safety is a challenge for the southern hemisphere as well. As these nations develop, they also exhibit a greater demand for high-energy foods like red meat, which creates more demand for food overall by increasing the need for final products and animal feed products.

The northern hemisphere outlook for 2030 includes a steady increase in retail food prices driven largely by rising energy and fertilizer costs, as well as by increasing demand. Depending on pricing incentives, biofuels could potentially convert arable crop land away from food production or provide a productive use for inefficient land. Further changes will be based on shifts in consumer demand toward things like sustainable, organic, or localized agriculture. The southern hemisphere will likely see greater inclusion in international trade due to events like the Doha trade talks. The more we engage in the transfer of knowledge and technology, the closer we will come to attaining equality and fairness.

Armand B. Peschard-Sverdrup, Senior Associate, Americas Program at the Center for Strategic and International Studies (CSIS)

North America will face a variety of threats over the coming decades, including terrorism, intercontinental missile attacks, economic shocks, diseases and pandemics, energy scarcity, environmental pressures, and natural disasters. These threats will test the capacity of our institutions and pose a serious risk to citizens' welfare. We must expand the traditional view of security to include things like natural disasters and other environmental catastrophes, diseases

that threaten public health and contaminate or limit the food supply, and water scarcity. Even if the direct damage is only regional or national, the effects will be felt internationally through economic impacts or increased political instability.

Climate change in particular represents a growing threat. We must try to mitigate it, but even with strict policies, it will take decades for the system to stabilize, so we must also invest heavily in adaptation measures. The effects of climate change (drought, natural disasters, etc.) will pose a mounting challenge for public health and food production, with implications for economic and political stability, as well as migration patterns. Mr. Peschard-Sverdrup raised some examples of these new types of security threats, including conflicts over water use in the Mexico-US border region and the geopolitical issues surrounding melting ice in the Arctic. He concluded with the message that creating an integrated response to climate change would represent the first real attempt by the North American governments to collaborate in a genuine spirit of cooperative transnational policy.

Questions and comments

- From the panel: The reason we have such cheap food is the large body of subsidies for the production and transportation of food products. We could reduce energy inputs, but farmers do not currently economize because of the structure of incentives. Shifting to localized food production would greatly reduce energy inputs, and many farms are moving in this direction. Food costs are currently on the rise because of increasing energy prices and mounting concerns over food safety, so this will force consumers to start prioritizing in terms of the types of food they buy.
- From the panel: Large developing nations like China play an enormous role in global resource use. If we engage in heavy technology transfers during their formative years, we can help them to build sustainable infrastructure that will benefit everyone in the future.
- The panelists talked about a number of alternative energy solutions, but nobody mentioned biomass energy, hydroelectricity, or solar energy.
 - Response: Those resources are all very important, but time constraints prevented the panelists from discussing them. Small-scale hydro in particular offers benefits for dispersing energy production, thereby reducing energy transmitting costs.
- Our national governments seem to have an outdated approach to environmental and energy policy. How can we overcome the impediments to policy action?
 - Response: Our government systems are plagued by strong, inflexible institutions and a lack of foresight. At the end of the day, lower levels of government may end up driving change and spurring higher-level action.
- From the chair: None of the panelists discussed the role of the private sector in solving environmental problems, but they can be as much a part of the solution as they have been part of the problem
 - Response: This is very true. Businesses react to economic pressures and are capable of changing much more quickly than governments. They can also help environmental efforts by providing access to capital and resources.

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Irene Henriques, JPAC member

Ms. Henriques exhorted the audience to move away from feelings of despair and paralysis and toward an outlook of hope and change. We must all to take responsibility for our actions, since we are all part of the problem. She then offered a few conclusions from each of the three panels.

The first panel showed the environmental benefits of an integrated North American transportation sector, warned us about a potential influx of migrants who have been displaced by environmental problems, and challenged us to stop pointing fingers and instead show leadership by taking action. The second panel stressed the need to respond to climate change with a combination of adaptation and mitigation, as well as a combination of international cooperation and local action. We must not allow scientific uncertainty to stymie policy action, and we must prepare for the converging risks of a changing climate and an aging population. The third panel proved that security is no longer a purely military concept. Fears over energy security may cause environmental damage as we search for new sources of power, and food security may be threatened by climate change and the increased production of biofuels. These problems are all interrelated, so we should seek holistic, integrated solutions.

JPAC Meeting, 26 June 2008

Welcome and Opening Remarks by Jane Gardner, JPAC Chair

Ms. Gardner explained that several JPAC members were unavailable, so there was no quorum for the meeting. The JPAC members who were present all introduced themselves and approved the agenda for the meeting. Ms. Gardner then explained the purpose of the National Advisory Committee (NAC) and the Governmental Advisory Committee (GAC). She noted that the Canadian NAC was discharged in 2006 and that a new one had yet to be convened, and then invited representatives from the two other countries to speak.

US NAC Representative

In the last letter of advice to the US government, the NAC emphasized three main areas: trade and environment, with a focus on outreach efforts and symposia; competitiveness, with a focus on small and medium enterprises; and the Enforcement Working Group, with particular reference to the Trade and Environment Working Group's efforts on regulating the international transportation of hazardous materials.

The NAC supports the CEC's recent shift toward long-term involvement in the issue of climate change, and urges the government to use the materials the CEC has produced, including the Green Building Report, the Mosaic Report and its environmental report cards, and biodiversity documents like the Vaquita Action Plan.

US GAC Representative

The US GAC's letter of advice was very similar to the NAC's, touching on the following issues: outreach, economic and environmental sustainability, import safety, and the Green Building Report. The GAC has also met with Administrator Stephen Johnson of the EPA and discussed a potential role for the CEC in carbon emissions standards, monitoring, and reporting, as well as in the expanding field of biofuels and technology. The representative concluded by encouraging the Canadian government to reconvene a NAC and a GAC as soon as possible.

Mexican NAC Representative

The NAC has been guiding the Mexican Ministry for Environment on issues like the preservation of the monarch butterfly, the regulation of toxic chemicals, deforestation, water quality, and water availability. It has also provided an avenue for public participation in decision-making in environmental protection and sustainable development. The new members of the Mexican NAC will be appointed shortly, with the leaders of the regional councils comprising six of its members and the rest chosen from a diverse group of individuals from academia, NGOs, and indigenous groups.

JPAC Questions and comments

- JPAC asked the US NAC and GAC representatives to expand on their suggestions to the US government in terms of recommending a greater role of the CEC.
 - Response: This issue has been raised a number of times in recent years, most often in the context of a climate registry and a green credit certification mechanism for alternative energy. In terms of the climate registry, the CEC could play a role in establishing a robust and transparent set of protocols for monitoring and reporting greenhouse gas emissions, as well as in the standardization of regulations across the three jurisdictions.

Potential advice to Council

Ms. Gardner encouraged JPAC to take all the public feedback into account, since JPAC's role is to facilitate communication between the Council and the general public. All the members agreed that JPAC should definitely issue advice based on the conference because of the important issues raised by the various speakers. They expressed the opinion that the United Nations is not up to the task of global environmental management, meaning that we must engage transnational organizations, national governments, and individual people to address the problems we currently face.

Concrete suggestions for Council include defining a greater role for the CEC that will allow for proactive action. The most important message from the conference was the need to act immediately, stressing the importance of a timely response. Global institutions are critically important, but we can't wait for them to finish their lengthy deliberations. Still, the CEC has a limited budget that is unlikely to be increased in the near future, so we must evaluate how these new responsibilities might be accommodated with available resources.

Questions and comments

- If the CEC is to add to the global environmental debate, it will need to hold more provocative sessions. Talking about 2030 is important, but we should be talking about what we need to do today.
- The Submissions on Enforcement Matters (SEM) process has been rendered impotent by increasing interference from the Council and delays or even failures by the Secretariat in making decisions. Government representatives are getting in the way, and citizens are starting to give up on the process. This mechanism was meant to separate the CEC from other environmental groups, and if we don't take steps to protect its integrity, the CEC may become irrelevant.
- The European Union is taking action on climate change that will eventually affect North American companies by imposing taxes and tariffs. The CEC should help to organize similar regulations in North America to protect domestic companies from receiving a competitive disadvantage in the future.

Approved by JPAC 8 September 2008



Commission for Environmental Cooperation (CEC) of North America

Fifteenth Regular Session of the CEC Council

and meetings of the Joint Public Advisory Committee (JPAC)

25–26 June 2008

Government Conference Center 2 Rideau Street Ottawa, Canada

Preliminary Program of Public Events

Tuesday, 24 June 2008

19:00–20:00 Registration of Participants

Wednesday, 25 June 2008

| 7:50-8:50 | Registration of Participants – Ante Room | |
|------------|--|--|
| 8:50–17:30 | "North America 2030: An Environmental Outlook" – Main Hall | |
| | 8:50-8:55 | Welcoming remarks by Jane Gardner, JPAC Chair |
| | 8:55–9:05 | Overview presentation – Trends Driving the Environmental Agenda: Adrián Vazquez, CEC Executive Director |
| | 9:05–9:50 | Keynote address: Thomas Homer-Dixon, George Ignatieff Chair of Peace and Conflict Studies at the Trudeau Centre for Peace and Conflict Studies at University College, University of Toronto ² |
| | 9:50-10:20 | Question and answer period |
| | 10:20–10:45 | OECD Global Environmental Outlook (2030): Robert Visser, Deputy- Director, Environment Directorate, Head - Environment, Health and Safety Division, Organization for Economic Cooperation and Development |

² As of total 1, he will be the houser of the chair of Flobals years s, centre for international foremance innovation at the Balsille School of International Amarks in w arendo, canada.

- 10:45–11:00 Break
- 11:00–11:45 Panel I: Continued Growth and Integration of North American Societies

Topics/Issues:

• Population and economic growth: the implications of demographic change and migration patterns

Ellen Kraly, William R. Kenan Jr. Professor of Geography, Director of the Upstate Institute, Colgate University

• Deeper economic integration (NAFTA+): the environmental consequences of increasing/shifting consumption, production and trade within North America

Isabel Studer, Director of the Center for Dialogue and Analysis on North America, *Instituto Tecnológico y de Estudios Superiores de Monterrey* (Mexico City campus)

• Urbanization and transportation: the implications of continuing urbanization, the built environment and an integrated just-in-time North American economy and infrastructure

Rodolfo Lacy, Research coordinator of energy and environment projects, Mario Molina Center for Strategic Studies on Energy and Environment

• North America's built environment: the environmental footprint of and potential energy performance improvements in North American building markets

Martin Adelaar, Principal, Marbek Resource Consultants, Ltd.

- 11:45–12:15 Moderated discussion led by Jane Gardner, JPAC Chair and member for the United States
- 12:15–13:15 Networking lunch *Main Lounge*
- 13:15–14:00 Panel II: Global Environmental Change; the Challenge for North America

Topics/Issues:

• Climate change and its expected impacts upon North America: Mitigation and adaptation challenges

Gordon McBean, Professor of Geography, University of Western Ontario and Chair for Policy in the Institute for Catastrophic Loss Reduction **Victor Magaña**, Professor of Atmospheric Science and head of the Department of Meteorology, Center of Atmospheric Science, National Autonomous University of Mexico (UNAM), and member of the Intergovernmental Panel on Climate Change

• Climate change and the biodiversity implications for North America's marine and terrestrial habitats

Jorge Soberón, Professor, Division of Ornithology, University of Kansas

• Anticipated impacts of climate variability and change on human health at a North American scale

Kristie L. Ebi, independent consultant (ESS, LLC), and a lead author for the human health chapter of the IPCC Fourth Assessment Report

- 14:00–14:35 Moderated discussion led by Eduardo Rincón, JPAC member for Mexico
- 14:35-14:50 Break
- 14:50–15:45 Panel III: Environmental Security

Topics/Issues:

• Energy security, supply and use: possible scenarios with different environmental and economic implications, choices concerning technologies/policies (carbon capture sequestration, biofuels, renewable energy)

Hamid Arastoopour, Henry R. Linden Professor of Energy, Department of Chemical and Biological Engineering, Illinois Institute of Technology-IIT

Jatin Nathwani, Ontario Research Chair in Public Policy and Sustainable Energy Management, Executive Director Waterloo Institute for Sustainable Energy (WISE) at University of Waterloo

• Food security: environmental issues and impacts of food production and commerce, including competition for land and water, land for biomass, water for agriculture, and land and water for biodiversity

Deborah Popper, Visiting lecturer, Princeton Environmental Institute (PEI), Princeton University

Sylvain Charlebois, Associate Dean, Kenneth Levene Graduate School of Business, University of Regina

• Physical security: the environmental implications of thicker boundaries, the challenges for conservation, synergies for enforcement

Armand B. Peschard-Sverdrup, Senior Associate, Americas Program at the Center for Strategic and International Studies (CSIS)

- 15:45–16:25 Moderated discussion led by Gordon Lambert, JPAC member for Canada
- 16:25-16:30 Wrap-up by Irene Henriques, JPAC member for Canada

16:30–17:30 Networking Session for the Public

The public is invited to meet and exchange views on North American environmental issues. JPAC members will attend as observers. Participants should appoint the chair of this session, who will present the results at the public portion of the Council Session on 26 June.

19:00–20:30 Welcoming Reception and Official Opening of the 15th Regular Session of the Council (public) - (Department of Foreign Affairs and International Trade, 125 Sussex Drive, 9th floor)

- Opening remarks by John Baird, Canadian Environment Minister
- Remarks by Stephen L. Johnson, Administrator, US Environmental Protection Agency
- Remarks by Juan Elvira Quesada, Mexican Secretary for Environment and Natural Resources
- Remarks by Jane Gardner, JPAC Chair
- Remarks by Adrián Vázquez, CEC Executive Director

Thursday, 26 June 2008

8:00–9:00 Registration of Participants – Ante Room

- **9:00–11:15** Council Session (open to the public) *Main Hall*
 - 9:00–9:15 Adoption of the agenda by Council and report by Adrián Vázquez, CEC Executive Director, on accomplishments of the CEC
 - 9:15–11:15 Presentations and Council discussion on the following themes:
 - NAFTA and the North American environment
 - Cooperation for environmental results in North America
 - Conserving North America's biodiversity
 - Risk management for toxics the new Sound Management of Chemicals initiative
 - Eliminating environmental threats from non-compliant imports entering North America
 - Accelerating market-based environmental progress
 - Green building in North America: opportunities and challenges
 - Greening the North American auto sector
 - Reporting on the state of the North American environment

11:15-11:30 Break

11:30–12:15 JPAC Regular Session 08-02 (with the public as observers)

| 11:30-11:35 | Overview by Jane Gardner, JPAC Chair, and approval of the provisional |
|-------------|--|
| | agenda |
| 11:35–11:45 | Report from the National and Governmental Advisory Committee representatives |
| 11:45-12:00 | JPAC discussion on a potential advice to Council |
| 12:00-12:15 | Observer' comments |

12:15–14:15 Lunch [included] – Main Lounge

14:15–15:45 Council Public Session – Main Hall

- Introduction on the conduct of the session by Jane Gardner, JPAC Chair
- Reports on the JPAC Environmental Outlook Conference/Regular Session and on the results of the Networking Session
- Statements by pre-selected presenters
- Comments by Council members

15:45 End of Session

Final Participants List \ Lista Final de Participantes \ Liste finale de participants

Fifteenth Regular Session of the CEC Council \ Decimoquinta Sesión ordinaria del Consejo de la CCA \ XVe session ordinaire du Conseil de la CCE. Ottawa, 25 - 26 June 2008.

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Fifteenth Regular Session of the CEC Council

and meetings of the Joint Public Advisory Committee (JPAC)

"North America 2030: An Environmental Outlook"

25–26 June 2008

Links to access the panel presentations

Keynote address: **Thomas Homer-Dixon**, George Ignatieff Chair of Peace and Conflict Studies at the Trudeau Centre for Peace and Conflict Studies at University College, University of Toronto

http://www.cec.org/files/pdf/JPAC/Homer-Dixon%20CEC.pdf

OECD Global Environmental Outlook (2030): **Robert Visser**, Deputy-Director, Environment Directorate, Head - Environment, Health and Safety Division, Organization for Economic Cooperation and Development

http://www.cec.org/outlook/files/Visser_OECD_Wed_1030.ppt

Panel I: Continued Growth and Integration of North American Societies

Population and economic growth: the implications of demographic change and migration patterns: **Ellen Kraly**, William R. Kenan Jr. Professor of Geography, Director of the Upstate Institute, Colgate University

http://www.cec.org/outlook/files/Kraly_CEC_June25.ppt

Deeper economic integration (NAFTA+): the environmental consequences of increasing/shifting consumption, production and trade within North America: **Isabel Studer**, Director of the Center for Dialogue and Analysis on North America, Instituto Tecnológico y de Estudios Superiores de Monterrey (Mexico City campus)

http://www.cec.org/outlook/files/Studer_CEC_June25.ppt

Urbanization and transportation: the implications of continuing urbanization, the built environment and an integrated just-in-time North American economy and infrastructure: **Rodolfo Lacy**, Research coordinator of energy and environment projects, Mario Molina Center for Strategic Studies on Energy and Environment

http://www.cec.org/outlook/files/LACY_CEC_Urbanization%20and%20Transport.ppt

North America's built environment: the environmental footprint of and potential energy performance improvements in North American building markets: **Martin Adelaar**, Principal, Marbek Resource Consultants, Ltd.

http://www.cec.org/outlook/files/Adelaar_CEC_June25.ppt

Panel II: Global Environmental Change; the Challenge for North America

Climate change and its expected impacts upon North America: Mitigation and adaptation challenges:

Gordon McBean, Professor of Geography, University of Western Ontario and Chair for Policy in the Institute for Catastrophic Loss Reduction

Victor Magaña, Professor of Atmospheric Science and head of the Department of Meteorology, Center of Atmospheric Science, National Autonomous University of Mexico (UNAM), and member of the Intergovernmental Panel on Climate Change

http://www.cec.org/outlook/files/McBean_Wed_CEC_1355.ppt

http://www.cec.org/outlook/files/Magana_CCE_June25.ppt

Climate change and the biodiversity implications for North America's marine and terrestrial habitats: **Jorge Soberón**, Professor, Division of Ornithology, University of Kansas

http://www.cec.org/outlook/files/Soberon_JPAC_June_25.ppt

Anticipated impacts of climate variability and change on human health at a North American scale: **Kristie L. Ebi**, independent consultant (ESS, LLC), and a lead author for the human health chapter of the IPCC Fourth Assessment Report

http://www.cec.org/outlook/files/Ebi_CEC_June25_1355.ppt

Panel III: Environmental Security

Energy security, supply and use: possible scenarios with different environmental and economic implications, choices concerning technologies/policies (carbon capture sequestration, biofuels, renewable energy):

Hamid Arastoopour, Henry R. Linden Professor of Energy, Department of Chemical and Biological Engineering, Illinois Institute of Technology-IIT

Jatin Nathwani, Ontario Research Chair in Public Policy and Sustainable Energy Management, Executive Director Waterloo Institute for Sustainable Energy (WISE) at University of Waterloo

http://www.cec.org/outlook/files/Arastoopour_CEC_June25.ppt

http://www.cec.org/outlook/files/Nathwani_CEC_June25.ppt

Food security: environmental issues and impacts of food production and commerce, including competition for land and water, land for biomass, water for agriculture, and land and water for biodiversity:

Deborah Popper, Visiting lecturer, Princeton Environmental Institute (PEI), Princeton University

Sylvain Charlebois, Associate Dean, Kenneth Levene Graduate School of Business, University of Regina

http://www.cec.org/outlook/files/Popper_CEC_June25.ppt

http://www.cec.org/outlook/files/Charlebois_CEC_June25.ppt

Physical security: the environmental implications of thicker boundaries, the challenges for conservation, synergies for enforcement: **Armand B. Peschard-Sverdrup**, Senior Associate, Americas Program at the Center for Strategic and International Studies (CSIS)

Wrap-up by Irene Henriques, JPAC member for Canada

http://www.cec.org/outlook/files/Henriques_CEC_June25.ppt