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### Canada-United States Energy, Trade, Security, and Policy

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# CANADA-UNITED STATES ENERGY, TRADE, SECURITY, AND POLICY

*Session Chair – R. Richard Newcomb*  
*Canadian Speaker – Michal Moore*

## INTRODUCTION

*R. Richard Newcomb*

MR. UJCZO: It is my great pleasure to introduce to you the chair of this session, a member of our Executive Committee, and longstanding supporter of the Institute, Rick Newcomb.<sup>1</sup> Rick is with DLA Piper Rudnick, LLP, United States in Washington D.C.,<sup>2</sup> and I invite you, Rick, to now introduce our keynote luncheon speaker.

MR. NEWCOMB: Thank you, Dan. It is my pleasure to be here this afternoon at the twenty-fifth Annual Canada United-States Law Institute Conference, and to introduce Dr. Michal Moore, Professor of Energy Economics and senior fellow at the Institute for Sustainable Energy, Environment, and the Economy at the University of Calgary in Alberta.<sup>3</sup>

Michal is the former Chief Economist at the National Renewable Laboratory in Golden, Colorado,<sup>4</sup> where he led a research team engaged in examining over-the-horizon issues for the Department of Energy and developing new methods for crosscutting analysis.<sup>5</sup> He is the former commissioner of the California Energy Commission,<sup>6</sup> where he held the position of Designated Economist.<sup>7</sup> In that role, Michal oversaw market structure issues, pricing

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<sup>1</sup> See Rick Newcomb, Biography, DLA Piper, <http://www.dlapiper.com/global/people/ajaxfreesearch.aspx?LastName=N&p=2> (last visited Nov. 8, 2009).

<sup>2</sup> *Id.*

<sup>3</sup> See Michal Moore, Biography, Institute for Sustainable Energy, Environment and Economy, <http://www.iseee.ca/node/218> (last visited Nov. 8, 2009).

<sup>4</sup> See National Renewable Energy Laboratory, <http://www.nrel.gov> (last visited Nov. 8, 2009).

<sup>5</sup> *Id.*

<sup>6</sup> See Michal Moore, Biography, The California Energy Commission, <http://www.energy.ca.gov/commissioners/moore.html> (last visited Nov. 8, 2009).

<sup>7</sup> See *id.*

of electricity and natural gas, and data collection for the commission as presiding member of the electricity and natural gas committee.<sup>8</sup> He directed the two billion dollar United States' program to maintain and expand renewable energy industry in the state<sup>9</sup> and presided over many complex siting cases for new fossil-fired generation.<sup>10</sup>

Dr. Moore received his Bachelor of Science degree in Geology at Humboldt State University,<sup>11</sup> a Master in Science from the Ecology Institute at the University of California at Davis in Land Economics,<sup>12</sup> and obtained a Ph.D. at the University of Cambridge in England in Economics,<sup>13</sup> where he is a member of Darwin College.<sup>14</sup> Dr. Moore is an active researcher in the areas of urban open space and agricultural land conversion, local government fiscal impacts, and the structure and rules of energy markets.<sup>15</sup>

Today Dr. Moore will address policy priorities in Canada and the United States for energy and their impact on environmental quality. As the policies of both nations seem to be in a state of flux, a unified outcome is uncertain.<sup>16</sup> Although innovative, the results have been uneven, inconsistent, and sometimes conflicting.<sup>17</sup> Dr. Moore will outline several initiatives that he believes can be productive and unify and strengthen the common Canadian United States policy goals in this area. I am pleased to introduce Dr. Michal Moore.

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<sup>8</sup> See *id.*

<sup>9</sup> See Michal Moore, Biography, Sigma Xi The Scientific Research Community, <http://www.sigmaxi.org/meetings/annual/program.energy.bios.html> (last visited Nov. 8, 2009).

<sup>10</sup> See *id.*

<sup>11</sup> See *id.*

<sup>12</sup> See *id.*

<sup>13</sup> See *id.*

<sup>14</sup> See *id.*

<sup>15</sup> See *id.*

<sup>16</sup> See Kristin Bluvas, *A Step Forward in United States Energy Policy*, 70 ALB. L. REV. 1589 (2007); see also Judith Hanebury, *Smart Regulation – Rhetoric or Reality*, 44 ALBERTA L. REV. 33 (2006).

<sup>17</sup> See, e.g., *id.*

## CANADIAN SPEAKER

*Michal Moore* \*

MR. MOORE: Thank you. I am honored to be here today, and flattered that you are entertaining the observations of an economist, considering some of the effigy dolls that I see swinging from Main Street these days; we may be on the verge of being officially declared an endangered species or absolute fair game. I want to tell you, as I start my remarks that I really do not care about energy. I care what it can do. I do not consume it to have it, because in many ways I cannot have it, store it, get it and use it, or put it out on display as they have with the fine cars outside. But I love what it can do for me. In fact, I cannot do without it.

I come to you as a product from a land of total optimism. A land built on hope, on the irrepressible base conviction that anything is possible; that if you willed it to be done, worked hard, tossed in a bit of clever innovation, a dash of capital, then wonderful inventions and progress were just around the corner.

Given those remarks, you may have suspected that my last sentence was a slip into a tired soliloquy about California. You may have been waiting for the irony that surrounds the sixth largest economy in the world mired in debt,<sup>18</sup> in diminished status when it once led the world,<sup>19</sup> but I am not. I came here today from my home of academe in Alberta, which is still a proud bearer of the new energy economy, emblematic of a strength and diversity of the Canadian spirit, despite the cataclysmic upheavals in the energy econo-

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\* Michal C. Moore is ISEEE Professor of Energy Economics and Senior Fellow at the Institute for Sustainable Energy, Environment and Economy at the University of Calgary in Alberta. He is the former Chief Economist at the National Renewable Laboratory in Golden Colorado, where he led a research team engaged in examining issues for the Department of Energy. Dr. Moore is a former Commissioner with the California Energy Commission, where he held the designated Economist position. In that role he oversaw market structure issues, pricing of electricity and natural gas and data collection for the Commission as presiding member of the Electricity and Natural Gas Committee. He directed the two billion dollar United States program to maintain and expand the renewable energy industry in the state and presided over many complex siting cases for new fossil fired generation. Dr. Moore received his Bachelor of Science in Geology at Humboldt State University and a Master of Science from the Ecology Institute at the University of California at Davis in Land Economics. He obtained a PhD from the University of Cambridge in England in Economics where he is a member of Darwin College.

<sup>18</sup> See George H. Soares, *Agriculture In Crisis: What California Must Do To Protect Its Most Precious Industry*, 11 S.J. AGRIC. L. REV. 19 (2001).

<sup>19</sup> See *id.*

my; where even Alberta is struggling to unravel the intricacies of the new energy economy.

There cannot be any question or doubt that we are in a troubling time of contraption.<sup>20</sup> However, as the President and the Prime Minister have both intoned recently, this period of instability will pass, not casually, not without a great deal of structural and collateral damage, but it will pass.<sup>21</sup> The other end will be a recovering economy, a hungry population, a capital-starved universe, and a series of countries facing a panoply of common problems that never go away. Not recession, not depression, war, or bright and expansive periods of unrestrained back-thumping confident periods of growth. What are they? They are basic, common, and undeniable: shelter, food, water, and energy. They will be waiting when we open the door from this storm, and I think we can use two of them as icons for how to rebuild in the coming years and create not only a stronger network of capital facilities but a tighter, securer geopolitical bond that reflects the resource in human capital-rich characteristics of North America.

The Annual Canada-United States Law Institute Conference concerns itself with the cross-border issues between Canada and the United States,<sup>22</sup> two great countries linked by more than proximity.<sup>23</sup> We have common languages,<sup>24</sup> we depend on common products,<sup>25</sup> and we have common challenges.<sup>26</sup> A few of those challenges, including food security,<sup>27</sup> the need for stable fi-

<sup>20</sup> See John Stencel, *Free Trade Versus Fair Trade*, 36 DENV. J. INT'L L. & POL'Y 349 (2008); see also Alexandre Deslongchamps, *Canada Economy Shrank at 3.4% Pace in Second Quarter*, BLOOMBERG, Aug. 31, 2009, <http://www.bloomberg.com/apps/news?pid=20601082&sid=a0sPJ7lk2wIA> (last visited Sept. 18, 2009); see also Ping Chew, *Will the U.S. Dollar Be Clipped?*, Standard & Poor's, <http://www2.standardandpoors.com/portal/site/sp/en/ap/page.hottopic/usdollar.html> (last visited Sept. 18, 2009).

<sup>21</sup> See Press Release, The White House, *Remarks By President Obama And Canadian Prime Minister Harper During Joint Press Release* (Sep. 16, 2009), available at [http://www.whitehouse.gov/the\\_press\\_office/Remarks-by-President-Obama-and-Canadian-Prime-Minister-Harper-During-Joint-Press-Availability](http://www.whitehouse.gov/the_press_office/Remarks-by-President-Obama-and-Canadian-Prime-Minister-Harper-During-Joint-Press-Availability); see also Anthony J. Luppino, *Entrepreneurship in a Global Economy: A Little of This, A Little of That: Potential Effects on Entrepreneurship of the McCain and Obama Tax Proposals*, 31 W. NEW ENG. L. REV. 717 (2009).

<sup>22</sup> See 2009 CUSLI Annual Conference, Canada-United States Law Institute, <http://cusli.org/conferences/annual/index.html> (last visited, Sep. 19, 2009).

<sup>23</sup> See generally *id.*

<sup>24</sup> See *id.*

<sup>25</sup> See S. Tina Piper, *The Tools and Levers of Access to Patented Health Related Genetic Invention in Canada*, 30 WASH. U. J.L. & POL'Y 43 (2009); see also Edwin Baker, *An Economic Critique of Free Trade in Media Products*, 78 N.C.L. REV. 1357 (2000).

<sup>26</sup> See CUSLI Annual Conference, *supra* note 22.

<sup>27</sup> See Sophie Theriault, *Inuit People's Food Security in the Age of Climate Change and Arctic Melting*, 15 SW. J. INT'L L. 223 (2009).

sheries,<sup>28</sup> common industrial standards,<sup>29</sup> someone mentioned the softwood lumber dispute, effective response to climate change,<sup>30</sup> water quality,<sup>31</sup> and one day perhaps water quantity,<sup>32</sup> and energy security.<sup>33</sup>

On that last point, we have discovered that the prodigious energy resources located at various points along this divide are absolutely critical to the economic success and the so-called energy security of both countries.<sup>34</sup> In short, we both have significant and important shares of critical goods that each country must have, to survive and prosper.<sup>35</sup> We know how to acquire, process, move, and sell these commodities.<sup>36</sup> In most cases we even know how to price them appropriately.<sup>37</sup>

I would like to focus on two of these common goods: energy and water. Both satisfy non-negotiable human needs; however, neither come without costs. They are abundant, but not free; and widely, but not uniformly, distributed in every compass direction.<sup>38</sup> Elsewhere on Earth, wars are and will be fought over both.<sup>39</sup> In North America, the political and capital facilities

<sup>28</sup> See generally Candace L. Bates, *U.S. Ratification of the U.N. Convention on the Law of the Sea: Passive Acceptance is Not Enough to Protect U.S. Property Interests*, 31 N.C.J. INT'L L. & COM. REG. 745 (2006).

<sup>29</sup> See Colin Fenwick, *Decency and Fairness in Labor Standards: an Australian Perspective on a Canadian Proposal*, 29 COMP. LAB. L. & POL'Y J. 491 (2008); see also H.W. Arthurs, *National Traditions in Labor Law Scholarship: The Canadian Case*, 23 COMP. LAB. L. & POL'Y J. 645 (2002).

<sup>30</sup> See James D. Ford, *A Priority for Action on Climate Change for Canadian Inuit*, 8 SUSTAINABLE DEV. L. & POL'Y 25 (2008); see also Meinhard Doelle, *The Kyoto Protocol: Reflections on Its Significance on the Occasion of its Entry into Force*, 27 DALHOUSIE L.J. 555 (2004).

<sup>31</sup> See Gregory F. Szydłowski, *The Commoditization of Water: A Look at Canadian Bulk Water Exports, The Texas Water Dispute, and the Ongoing Battle under NAFTA for Control of Water Resources*, 18 COLO. J. INT'L ENVTL. L. & POL'Y 665 (2007); see also Melissa Kwaterski Scanlan, Joki Habush Sinykin, James Krohelski, *Realizing the Promise of the Great Lakes Compact: A Policy Analysis for State Implementation*, 8 VT. J. ENVTL. L. 39 (2006).

<sup>32</sup> See generally Szydłowski, *supra* note 31.

<sup>33</sup> See Gary C. Hufbauer, Yee Wong, *Security and the Economy in the North American Context: The Road Ahead for NAFTA*, 29 CAN. U.S. L.J. 53 (2003).

<sup>34</sup> See Neil Craik & Joseph DiMento, *Environmental Cooperation in the (Partially) Disaggregated State: Lessons from the Security and Prosperity Partnership of North America*, 8 CHI. J. INT'L L. 479 (2008).

<sup>35</sup> See Szydłowski, *supra* note 31; see also Scanlan, *supra* note 31.

<sup>36</sup> See Scanlan, *supra* note 31.

<sup>37</sup> See Roland Priddle, *Reflections on National Energy Board Regulation 1959-98: From Persuasion to Prescription and on to Partnership*, 37 ALBERTA L. REV. 524 (1999); see also Alexander Black, *Economic and Environmental Regulatory Relations: United States-Canada Free-Trade in Energy*, 8 CONN. J. INT'L L. 583 (1993).

<sup>38</sup> See generally Daniel H. Cole, *Climate Change, Adaption, and Development*, 26 UCLA J. ENVTL. L. & POL'Y 1 (2008).

<sup>39</sup> See Timothy L. Fort, Cindy A. Schipani, *Ecology and Violence: The Environmental Dimensions of War*, 29 COLUM. J. ENVTL. 243 (2004).

compound and complicate a meta-regional distribution network that grew up in response to, rather than in anticipation of, the demands for these core resources.<sup>40</sup>

Canada, arguably the United States' most important trading partner,<sup>41</sup> is a source for much of the United States' demand for energy in all its forms.<sup>42</sup> Take natural gas. Canada had 57.9 trillion cubic feet (TCF) of proven natural gas reserves in January 2008.<sup>43</sup> The country produced 6.5 TCF of natural gas in 2006 while roughly consuming only half of that at 3.5 TCF.<sup>44</sup>

After the United States, Canada is the second-largest producer of natural gas in the Western Hemisphere,<sup>45</sup> and is a critical source of the United States' natural gas supply.<sup>46</sup> In 2006, it exported 3.6 TCF of natural gas to the United States, which represents eighty-six percent of all the United States' natural gas imports that year.<sup>47</sup>

In terms of electricity, the networks in Canada and the United States are heavily integrated.<sup>48</sup> In 2006, Canada exported 41.5 billion kilowatt hours of electricity to the United States,<sup>49</sup> but at the same time, Canada imported 23.4 billion kilowatt hours.<sup>50</sup> Over the last ten years, Canadian imports of electricity from the United States increased tenfold, while its exports remained relatively constant.<sup>51</sup>

In 2007, \$41.6 billion worth of crude oil was transported to the United States<sup>52</sup> along with \$31.4 billion worth of natural gas<sup>53</sup> and \$3.1 billion worth of electricity.<sup>54</sup> The United States can acquire or replace much of this energy

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<sup>40</sup> See Jeffrey J. Clayton, *Re-Writing Western Water Law in the 21<sup>st</sup> Century*, 5 U. DENV. WATER L. REV. 525 (2002).

<sup>41</sup> See generally Paul Sundell, Mathew Shane, *Canada: A Macroeconomic Study of the United States' Most Important Trade Partner*, United States Department of Agriculture Rep. No. WRS-06-02 (2006).

<sup>42</sup> See Stacey L. Middleton, *How the Petroleum Addict Negotiates with the Dealer: Challenges to the Bush Administration's North American Energy Policy*, 11 CARDOZO J. INT'L & COMP. L. 177 (2003).

<sup>43</sup> See Energy Information Administration, Natural Gas, <http://www.eia.doe.gov/emeu/cabs/Canada/NaturalGas.html> (last visited Nov. 8, 2009).

<sup>44</sup> See *id.*

<sup>45</sup> See *id.*

<sup>46</sup> See *id.*

<sup>47</sup> See *id.*

<sup>48</sup> See Canadian Electricity Association, *Enhancing our Integrated Electricity System*, [http://www.canelect.ca/en/Pdfs/CEA\\_NARreport\\_Web\\_E.pdf](http://www.canelect.ca/en/Pdfs/CEA_NARreport_Web_E.pdf) (last visited Nov. 8, 2009).

<sup>49</sup> See *id.* at 11.

<sup>50</sup> See *id.*

<sup>51</sup> See *id.*

<sup>52</sup> See Centre for Energy, Canada/U.S. Energy, <http://www.centreforenergy.com/AboutEnergy/CanadianEnergy/Environment/Default.asp?page=6> (last visited Nov. 8, 2009).

<sup>53</sup> See *id.*

<sup>54</sup> See *id.*

by denying Canadian sources, and turning to someone else,<sup>55</sup> but at what cost?

Twenty years ago acquiring oil from the oil sands of Alberta was only a dream largely held in two universities and a handful of boardrooms.<sup>56</sup> Today, although constrained due to the economic recession and a diminished demand for transportation fuels and some derivative products such as plastics, the oil sands represent a significant well of future supply for the United States and for Canada, as well as a mainstay of the drive to remain energy independent.<sup>57</sup> In my notes, I put "energy independent" in quotes just to remind myself what an oxymoron that is, and I hope that at the end of this talk you will share that opinion with me.

In the face of changing geopolitical winds that buffet the Middle East, China, and those Europeans who depend on Russian exports;<sup>58</sup> would you not hate to be Belgium at the other end of a supply chain that had leased Russian pipe systems, leased Russian pump stations, and a long-term contract with Russian gas suppliers if they got upset with you over something you did or said?

The United States can increase, and in fact, has increased, domestic electricity output by a concerted drive to build new gas-fired and coal-fired generation.<sup>59</sup> For a while that that set of policies worked to slow but not to reverse the supply and demand imbalance that we face in North America.<sup>60</sup>

As a Commissioner, I was once a part of the effort to increase the fleet of clean-burning natural gas-fired electric generation.<sup>61</sup> Now, we have begun to realize that the supply of natural gas is ultimately very dear.<sup>62</sup> In fact, in some regions, it is in decline, and it has to be husbanded carefully in order to manage its ultimate supply.<sup>63</sup>

In the past, we experimented with more efficient coal-fired electricity generation, and now we are investing heavily in renewable energy re-

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<sup>55</sup> See *id.*

<sup>56</sup> See Government of Alberta, Energy, [http://www.energy.gov.ab.ca/OurBusiness/oil\\_sands.asp](http://www.energy.gov.ab.ca/OurBusiness/oil_sands.asp) (last visited Nov. 8, 2009).

<sup>57</sup> See *id.*

<sup>58</sup> See generally John Fohr, *How NAFTA Can Increase Global Energy Security*, 22 WIS. INT'L L.J. 741 (2004).

<sup>59</sup> See SEN. JAMES M. INHOFE, ENERGY AND THE ENVIRONMENT: THE FUTURE OF NATURAL GAS IN AMERICA 3 (2005), available at <http://epw.senate.gov/repwhitepapers/Energy.pdf>.

<sup>60</sup> See *id.*

<sup>61</sup> See Clean-Energy, About Gasification, <http://www.clean-energy.us/facts/gasification.htm> (last visited Nov. 8, 2009).

<sup>62</sup> See Energy Information Administration, Limited Electricity Generation Supply and Limited Natural Gas Supply Cases, [http://www.eia.doe.gov/oiaf/aeo/otheranalysis/aeo\\_2008analyses/papers/legslnsg.html](http://www.eia.doe.gov/oiaf/aeo/otheranalysis/aeo_2008analyses/papers/legslnsg.html) (last visited Nov. 8, 2009).

<sup>63</sup> See *id.*



sources,<sup>64</sup> but history shows us that this effort, at best, is inconsistent and often pits immature technologies against each other to the ultimate detriment of the system.<sup>65</sup>

Nonetheless, there is hope that we can diversify our energy supplies, manage demand, and deal with excess carbon, without terminally throttling our, or the world's, economic potential.<sup>66</sup> The rally cry is innovation, and we hear it from North America to Africa,<sup>67</sup> but is it enough?

In the energy world, innovation can and has taken us a long way to energy resiliency, but not independence.<sup>68</sup> In the case of the United States and Canada, bound at the border as we are, independence really means infinite interdependence.<sup>69</sup> It is inescapable that the United States and Canada cannot, and frankly will not, ever stop trading energy across the border.<sup>70</sup> What is escapable is the long-term pursuit of common goals with inefficient tools or systems compounded by penalizing fist-shaking tariffs, inspections, or charges.<sup>71</sup> In other words, we don't always make it easy to move this critical commodity back and forth, but try. For instance, we do spend a great deal of time thinking about coordinating the policy initiatives of each country, for example NAFTA.<sup>72</sup> Of course, to rely on a NAFTA level of innovation and cooperation will be difficult and perhaps not productive in the long-term.<sup>73</sup> Why? Because the responsibility for success is in the wrong hands, policy-makers set the standard, but they do not make the rules.<sup>74</sup> At times they think they do, but they do not in the end.<sup>75</sup> In fact, in the heat of decision making and the need to move onto evermore pressing demands, they may indeed

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<sup>64</sup> See Jim Doyle, *Challenges and Opportunities for Regulating Greenhouse Gas Emissions at the State, Regional and Local Level*, 27 UCLA J. ENVTL. L. & POL'Y 213 (2009).

<sup>65</sup> See *id.*

<sup>66</sup> See generally Ned Farquhar, *Energy, Security, Climate: Converging Solutions*, 29 J. LAND RESOURCES & ENVTL. L. 1 (2009).

<sup>67</sup> See *id.*

<sup>68</sup> See Steven Ferrey, *Corporate Governance and Rational Energy Choices*, 31 WM. & MARY ENVTL. L. & POL'Y REV. 113 (2006); see also Edna Sussman, *Exploring How Today's Development Affects Future Generations Around the Globe: Climate Change Adaption Planning Guidance for Local Governments in the United States*, 9 SUSTAINABLE DEV. L. & POL'Y 31 (2009).

<sup>69</sup> See Fohr, *supra* note 58.

<sup>70</sup> See *id.*

<sup>71</sup> See *id.*

<sup>72</sup> See *id.*; see also Antoine Half, *Creating a Legal Framework for Sustainable Energy: Energy Nationalism Consumer Style: How the Quest for "Energy Independence" Undermines U.S. Ethanol Policy and Energy Security*, 19 STAN. L. & POL'Y REV. 402 (2008).

<sup>73</sup> See Stacey L. Middleton, *How the Petroleum Addict Negotiates With the Dealer: Challenges to the Bush Administration's North American Energy Policy*, 11 CARDOZO J. INT'L & COMP. L. 177 (2003).

<sup>74</sup> See *id.* at 184-85.

<sup>75</sup> See *id.* at 190-194.

have forgotten about them.<sup>76</sup> That is why they appoint regulators who specialize in designing, updating, and enforcing the rules.<sup>77</sup> Now more than ever, in the midst of a global crisis, we need all the actors in this play to work together, in order to craft cooperative and resilient solutions.<sup>78</sup>

Energy, and by inference, environmental quality associated with its generation, is critical to the economic growth and security of each country.<sup>79</sup> To obtain energy, I believe that we should make and can make the border more transparent. Here, I offer several initiatives that, if undertaken, will make sure the next period of political reassessment and definition are productive, not punitive, and act to unify and strengthen our common policy goals.

To start, I acknowledge that the United States and Canada have complementary policy priorities for energy and closing or converging priorities for environmental quality issues.<sup>80</sup> However, actual policy making in both countries is in a state of visible and tangible flux, which makes the outcome extremely uncertain;<sup>81</sup> however, at the same time opens up the opportunities for cooperation and success.

I hope that you take the non-negotiable nature of electric power as my example. In fact, power, fuels, and transmission systems in general. Modern society cannot exist without power systems. Our industry, lighting, transportation, and every engine of economic growth could not function without delivered energy.<sup>82</sup> It is a world we subsidize, oversee, and worry about all the time publicly and in the broader investment community.<sup>83</sup> Both the United States and Canada regulate and oversee power systems with roughly the same tools,<sup>84</sup> appointed regulators who respond to policy direction from elected legislatures, long-range resource planning, and guidelines for return to investment.<sup>85</sup> Recently each country has seen experiments in de- or re-

<sup>76</sup> See *id.*

<sup>77</sup> See *id.* at 185-87.

<sup>78</sup> See Lakshman Guruswamy, *The Law and Economics of Development and Environment: Sustainable Energy: A Preliminary Framework*, 38 IND. L. REV. 671 (2005).

<sup>79</sup> See Michal C. Moore, *Sustainable Development and Smart Energy: Renewable Technologies to Power and Empower the Developing World*, 16 COLO. J. INT'L ENVTL. L. & POL'Y 377 (2005).

<sup>80</sup> See Craik & DiMento, *supra* note 34; see also Alan Nymark, *Taking Stock of Where We Stand in Dealing With Environmental Problems in the Canada/U.S. Context: The Choices to be Made*, 28 CAN.-U.S. L.J. 27 (2002).

<sup>81</sup> See Bluvus, *supra* note 16.

<sup>82</sup> See Institute For Energy Research, *Energy Overview*, <http://www.instituteeforenergyresearch.org/energy-overview> (last visited Nov. 8, 2009).

<sup>83</sup> See *id.*

<sup>84</sup> See Clark Byse & John M. Olin, *Markets as Regulators: A Survey*, 80 S. CAL. L. REV. 1239 (2007).

<sup>85</sup> See *id.* at 1245.

regulation,<sup>86</sup> and each country is concerned with issues of independence, security, and long-term access or affordability to energy resources.<sup>87</sup>

In reflection, the increasing interdependence of the networks of both countries, we have improved efforts to increase cooperation and coordination between Canada and the United States.<sup>88</sup> We have new rules for planning and managing the electric grid through the North American Electric Reliability Council (NERC), an intergovernmental organization that monitors network reliability, settles trans-border disputes and formulates common industry standards.<sup>89</sup> However, it is just not enough, and it will not be enough.

I submit that we unify our regulatory institutions and clarify the roles that enable the groups of dedicated rule makers, to make markets work. Markets are not human; they are human inventions and they falter routinely, often in response to rapid changes in technology and operations, as well as, in the face of rapidly oscillating demand characteristics.<sup>90</sup> Since the needs of both countries are so similar,<sup>91</sup> as are the regulatory institutions,<sup>92</sup> imagine the impact of joint collaboration in some key areas. I believe we should create a unique precedent of joint international rule making, with clear standards, including, the control of externalities or unexpected events from power use or generation. I envision this as coordinated and unified, but not mandatory, codification of regulatory standards. Think about the logical areas of hearing design, evidence submission, and a streamlined general rate case structure. The list is long, but in the case of new capital facilities, or more importantly the area of transmission citing, rate recovery and rights of way streamlining to get past the nineteenth century model that we use today could be very beneficial.

Since Canadian-American energy flows have a primarily north-south orientation to them, they naturally have to cross international borders, as well as, provincial and state boundaries.<sup>93</sup> Getting tariffs right ought to be a very high priority. As an ex-regulator, who still listens to the public, I am struck by how the regulatory process seems to reinvent itself routinely when con-

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<sup>86</sup> See *id.* at 1247.

<sup>87</sup> See *id.*

<sup>88</sup> See Judith Hanebury, *Smart Regulation – Rhetoric or Reality*, 44 ALBERTA L. REV. 33 (2006).

<sup>89</sup> See North American Electric Reliability Corporation, <http://www.nerc.com> (last visited Nov. 8, 2009).

<sup>90</sup> See Joseph E. Stiglitz, *Market Fundamentalism's New Fiasco: Globalization as Exhibit B in the Case for a New Law and Economics*, 24 MICH. J. INT'L L. 831 (2003).

<sup>91</sup> See Byse & Olin, *supra* note 84.

<sup>92</sup> See *id.*

<sup>93</sup> See Alexander J. Black, *Legal Principles Surrounding the New Canadian and American Arctic Energy Debate*, 23 ENERGY L. J. 81, 86 (2002).

fronted with the issue of interstate or international commerce.<sup>94</sup> I am not referring to the standards themselves here, but the consistency of the standards. Perhaps it is time for an international cross-border regulatory commission designed to adjudicate or recommend common tariff designs and standards. Such a regulatory commission will lead us to some common understanding and willingness to work with one of the greatest challenges for the next hundred years or so, which is the need for infrastructure rights-of-way and new transmission facilities.

Getting this right means that we can plan for new investments in infrastructure and that may lead us to redesigning the way we finance those improvements. If there is anything that is broken in both countries, it is the financing system that is used to underlay the capital systems that we are going to need in the future.<sup>95</sup>

We do not have to rely solely on outdated rate making standards as a sole means to recover cost.<sup>96</sup> I cannot imagine that any regulators, utility executives, consumers, and consumer advocates are happy with this situation. With all due deference, perhaps there is one group that is, and that is the utility lawyers, but I will stay away from that.

Our systems are not all about regulations and permits of course. I came from one of the United States national energy laboratories,<sup>97</sup> and I now work for an institute dedicated to discovering ways to more effectively link future energy use with economic vitality while minimizing environmental damage along the way.<sup>98</sup> A tall order, but with effective and consistent research backing, we can make significant progress. We are all after the same things, so why not join some of our NSERC and NCF grant awards to work contemporaneously with important institutions like Queens, Berkeley, and Carnegie Mellon? Imagine the innovative solutions to energy issues coming from a confluence of scholars and researchers from both countries. To cite a current sample, working the oil sands has yielded important breakthroughs in carbon capture and storage,<sup>99</sup> such as gasification of waste materials for fuels, time shifting of wind power with compressed air storage to offset the use of coal

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<sup>94</sup> See generally Robert E. Suggs, *The Unintended Repudiation of the Internal Affairs Doctrine and Constitutional Constraints on Choice of Law*, 56 OHIO ST. L.J. 1097, 1099 (1995).

<sup>95</sup> See Gerald Norlander, *May the FERC Rely on Markets to Set Electric Rates*, 24 ENERGY L.J. 65 (2003).

<sup>96</sup> *Id.*

<sup>97</sup> See National Renewable Energy Laboratory, <http://www.nrel.gov> (last visited Nov. 8, 2009).

<sup>98</sup> See Moore, *supra* note 3.

<sup>99</sup> See Government of Alberta, <http://www.energy.alberta.ca/Initiatives/1438.asp> (last visited Nov. 8, 2009).

for base load power.<sup>100</sup> We are going to need this kind of fundamental research if we hope to get the upper hand on carbon initiatives.<sup>101</sup> The United States will eventually turn its sight to the oil shale in Wyoming and upper Colorado.<sup>102</sup> Carbon emissions from this source of potential oil reserves will make the oil sands of Alberta look clean by comparison.<sup>103</sup> We should share the research, and frankly, we will be better off if we share the regulatory and policy standards that govern its extraction. Without collaboration, we risk the development of a patchwork of AB 32 fuel standards across Canada and the United States, such as those crafted by California.<sup>104</sup>

We can have joint research and development without risk. The United States has eleven national energy laboratories devoted to a wide range of energy research, technical development in modeling of energy systems.<sup>105</sup> Canada created a special series of dedicated institutes whose sole mission is to understand how to efficiently acquire, process, and transport energy.<sup>106</sup> Most of that energy is designed to move the United States in one form or another.<sup>107</sup> It is just arithmetic at that point: you can do the math on where the advantage lies. It makes sense to imagine more collaborative efforts in joining these massive research activities, especially since the externalities that are associated with energy production, let alone use, do not respect boundaries.<sup>108</sup>

Ultimately, we need to develop co-joined and developed carbon markets.<sup>109</sup> We cannot continue to produce, combust, and consume fossil energy without controlling carbon by-products.<sup>110</sup> This serious challenge involves, and in fact demands, the coordinated efforts of policymakers, scientists, economists, and financiers.<sup>111</sup> It will ultimately involve a series of stopgap measures like carbon capture and sequestration, as well as, the long-term

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<sup>100</sup> See *id.*

<sup>101</sup> See *id.*

<sup>102</sup> See Josh Branscomb, *U.S. Oil Shale—From Resources to Reserves*, 6 GEO. J.L. & PUB. POL'Y 397 (2008).

<sup>103</sup> See *id.*

<sup>104</sup> See California Environmental Protection Agency Air Resources Board, Assembly Bill 32: Global Warming Solutions Act, <http://www.arb.ca.gov/cc/ab32/ab32.htm> (last visited Jan. 25, 2010).

<sup>105</sup> See U.S. Department of Energy, National Laboratories and Technology Centers, <http://www.energy.gov/organization/labs-techcenters.htm> (last visited Jan. 25, 2010).

<sup>106</sup> See Canadian Energy Research Institute, Research, <http://www.ceri.ca/Research/research=index.asp> (last visited Jan. 25, 2010).

<sup>107</sup> See *id.*

<sup>108</sup> See Canada, Canada, *U.S. Need Joint Approach to Carbon Emissions: Study*, CANADA.COM, Feb. 2, 2009, available at <http://www.carbonoffsetsdaily.com/canada-news-channels/canada-us-need-joint-approach-to-carbon-emissions-study-4264.htm>.

<sup>109</sup> See *id.*

<sup>110</sup> See Guruswamy, *supra* note 78.

<sup>111</sup> *Id.* at 677.

market tools such as carbon taxes, trading of credits, and power substitution.<sup>112</sup>

Considering the nature of the resources shared between Canada and the United States, it is appropriate to manage these efforts without regard to borders.<sup>113</sup> This may involve opening markets in sulfur and petroleum coke, focusing on gasification, co-generation, and an admission that oil, electric, and acknowledging that natural gas markets are about energy, not countries, and they all overlap.<sup>114</sup>

We need integrated resource management plans.<sup>115</sup> It is not just about where the fuels are located; rather it is a question of deploying the appropriate technology that can be dispatched efficiently.<sup>116</sup> It is not about waste generation and management.<sup>117</sup> It is about a broad consideration from air, water, and water quality impacts relevant to things like nuclear fuel storage.<sup>118</sup> Right now we do all that in a piecemeal fashion, and the inefficiency that has built up over a century is staggering.<sup>119</sup> We need a diversity of supply.<sup>120</sup>

With that, I would like to offer just a word about renewable energy resources. I have spent the better part of my adult life trying to make renewable energy markets more accessible, reliable, and affordable.<sup>121</sup> In the future we will depend on them more, much more than we do today.<sup>122</sup> However, it is hard to imagine a much more inefficient system for integrating than the one we have today.<sup>123</sup> Imagine a sports team, like basketball, where every

<sup>112</sup> See James L. Olmsted, *Carbon Dieting: Latent Ancillary Rights to Carbon Offsets in Conservation Easements*, 29 J. LAND RESOURCES & ENVTL. L. 121 (2009).

<sup>113</sup> See Black, *supra* note 93.

<sup>114</sup> See Arnold W. Reitze, Jr., *Federal Control of Carbon Dioxide Emissions: What are the Options?*, 36 B.C. ENVTL. AFF. L. REV. 1 (2009).

<sup>115</sup> See Douglas L. Heinold, *Is Competition Among Energy Utilities an Environmental Disaster, Or Can it be Reconciled with Integrated Resource Planning*, 22 RUTGERS COMPUTER & TECH. L.J. 301 (1996).

<sup>116</sup> See Guruswamy, *supra* note 78.

<sup>117</sup> See David P. Ross, *Yucca Mountain and Reversing the Irreversible: The Need for Monitored Retrievable Storage in a Permanent Repository*, 25 VT. L. REV. 815 (2001).

<sup>118</sup> See Steven Ferrey, *Converting Brownfield Environmental Negatives into Energy Positives*, 34 B.C. ENVTL. AFF. L. REV. 417 (2007).

<sup>119</sup> *Id.*

<sup>120</sup> See Richard D. Cudahy, *PURPA: The Intersection of Competition and Regulatory Policy*, 16 ENERGY L. J. 419, 426 (1995); see also F. Michael Cleland & David J. Manning, *Securing the Energy Supply in North America*, 29 CAN.-U.S. L.J. 307, 309 (2003).

<sup>121</sup> See Moore, *supra* note 3.

<sup>122</sup> See Jodi Britton, *The National Energy Policy, Renewable Energy, and the Johannesburg Convention: Has the United States Been All Talk and No Action*, 12 PENN ST. ENVTL. L. REV. 241 (2004); see also Harman Scheer, *Energy Autonomy: Getting Serious About Renewable Energy*, 29 ENERGY L. J. 217, 221 (2008).

<sup>123</sup> See Ferrey, *supra*, note 118 at 452.

player on each team is totally focused on winning points for themselves, even at the cost of offending their teammates, but they are all on the field at the same time. Now substitute in for the players, solar, wind, hydrothermal, engineered geothermal, biomass, methane gas from landfills, and put them all in the same game with traditional thermal energy resource producers like coal and natural gas. That is not much of a team, is it? We can do a lot better than that.

We need new transmission systems, and we are going to need them rapidly.<sup>124</sup> I believe at the heart of our electricity system on both sides of the border we have vast areas of neglect that are out-of-sight and out-of-mind.<sup>125</sup> In part that is predictable. Transmission lines are expensive to build, difficult to price, fragile, and are the least subject to interruption.<sup>126</sup> Plus, they have a limited lifespan.<sup>127</sup> Many North American transmission lines' operational life is being reached.<sup>128</sup> Expanding this network is critical to sustain growth,<sup>129</sup> but more than that, planning for it, anticipating the new technology needed, and the rights of way that we do not have, do not know how to acquire efficiently, and do not know how to pay for, which is an Achilles heel that will not heal itself. Unfortunately, this area is where going it alone is likely to be inefficient.<sup>130</sup> We can share technology, and we can share investment.<sup>131</sup> Clearly, we do not have any choice but to share dispatch and load management.<sup>132</sup>

The future will involve the need to gain access to very distant resources to a much more diverse selection of technology.<sup>133</sup> Going it alone simply ensures duplication, waste, inefficiency, acrimony, and lost time, and we cannot afford any of those.<sup>134</sup>

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<sup>124</sup> See Steven Ferrey, *Power Future*, 15 DUKE ENVTL. L. & POL'Y F. 261, 275 (2005); see also David W. Drinkwater, *New Electricity: Generation, Pricing, Wheeling & Regulation*, 28 CAN.-U.S. L.J. 267, 276-280 (2002); see also Ryan Tyz, *Energy Maquiladoras: Integrating the Electricity Markets of the United States and Mexico*, 6 OR. REV. INT'L L. 63, 69 (2004).

<sup>125</sup> See Drinkwater, *supra*, note 124 at 276-280; see also Ryan Tyz, *Energy Maquiladoras: Integrating the Electricity Markets of the United States and Mexico*, 6 OR. REV. INT'L L. 63, 69 (2004).

<sup>126</sup> See *id.*

<sup>127</sup> See *id.*

<sup>128</sup> See *id.*

<sup>129</sup> See *id.*

<sup>130</sup> See Ferrey, *supra*, note 118; see also David P. Ross, *Yucca Mountain and Reversing the Irreversible: The Need for Monitored Retrievable Storage in a Permanent Repository*, 25 VT. L. REV. 815 (2001).

<sup>131</sup> See David Crane, *The Importance of Innovation in the World Context*, 32 CAN.-U.S. L.J. 9, 12 (2006).

<sup>132</sup> See *id.*

<sup>133</sup> See Lakshman Guruswamy, *Sustainable Energy: A Preliminary Framework*, 38 IND. L. REV. 671, 679 (2005).

<sup>134</sup> See Lakshman Guruswamy, *Post-Kyoto Energy and Environmental Security*, 16 COLO. J.

What ought to be clear by now is that this is not about supply alone.<sup>135</sup> The system, the chain of resource management, pricing, distribution, and most importantly, consumption, the dreaded demand curve, are at the heart of what we toss off as security.<sup>136</sup> That means efficient access to resource matters, and it matters a lot.<sup>137</sup> But in the end if we are going to coordinate energy security objectives, including the next unconventional oil resources, nuclear facility, the Northwest Passage before Russia takes it over, it is going to be about a lot more than high-level policy invectives and incentives.<sup>138</sup> It is a tangled scheme of local and regional regulations, long-term investment and capital facilities that is dependent on two things: the rules; and how long they will be in place. My icon for this is consistent regulation, and contracts to sell goods, fill pipes, energize wires, and control externalities.

I do not want Canada to look like the United States or vice-versa, which should be apparent in all of my remarks. We share common heritage and in many ways similar resources.<sup>139</sup> We are unique and yet joined at an artificial hip.<sup>140</sup> For example, just look at the boundary in the Great Lakes region.<sup>141</sup> We have some time to get this right but not a lot of time. The broad financial markets are in disarray,<sup>142</sup> a perfect opportunity as Mr. Emanuel says to create new forms and new patterns. The next round, including the opening of the Northwest Passage and access to all those resources is likely to be a brutal, hard-fought, but well worth the effort, event.<sup>143</sup>

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INT'L ENVTL. L. & POL'Y 333 (2005).

<sup>135</sup> See Justin Stolte, *The Energy Policy Act of 2005: The Path to Energy Autonomy?*, 33 J. LEGIS. 119 136-143 (2006); see also Jon Schutz, *Is a Domestic Production-based Oil Policy Appropriate for the United States*, 12 PENN ST. ENVTL. L. REV. 307, 314 (2004); see also Mark Cooper, *The Failure of Federal Authorities to Protect American Energy Consumers From Market Power and Other Abusive Practices*, 19 LOY. CONSUMER L. REV. 315 (2007).

<sup>136</sup> See Corey Stephen Shook, *How a Two-Tiered National Renewable Portfolio Standard, a System Benefits Fund, and Other Programs will Reshape American Energy Investment and Reduce Fossil Fuel Externalities*, 12 FORDHAM J. CORP. & FIN. L. 1011 (2007); see also Jon Schutz, *Is a Domestic Production-based Oil Policy Appropriate for the United States*, 12 PENN ST. ENVTL. L. REV. 307, 314 (2004).

<sup>137</sup> See *id.*

<sup>138</sup> See Branscomb, *supra* note 102.

<sup>139</sup> See Craik & DiMento, *supra* note 34.

<sup>140</sup> See *id.*

<sup>141</sup> See Mary Beth Brandoni, *A Preliminary Discussion of Natural Gas Pipelines Under the Great Lakes*, 11 BUFF. ENVTL. L.J. 149 (2004).

<sup>142</sup> See J. Michel Marcoux, *Canaries in the Coal Mine: Facts From Securities Fraud Private Civil Actions Can Identify Intent to Manipulate Energy Markets*, 29 ENERGY L. J. 141 (2008); see also Alexia Brunet & Meredith Shafe, *Beyond Enron: Regulation in Energy Derivatives Trading*, 27 NW. J. INT'L L. & BUS. 665 (2007).

<sup>143</sup> See generally Christopher Mark Macneill, *Gaining Command & Control of the Northwest Passage: Strait Talk on Sovereignty*, 34 TRANSP. L. J. 355 (2007).



We need each other to achieve the best outcome, and what better place to start working together than along a friendly and shared border.<sup>144</sup> We need a Pan-North American energy plan,<sup>145</sup> which will come with a shared responsibility for capital-intensive infrastructure expansion and a more resilient grid.<sup>146</sup> We need a WPA for energy,<sup>147</sup> and we need it now.

More than anything, though, it will speed up our transition to the next hundred years of challenging growth and an unceasing demand for energy.<sup>148</sup> Behind this new cooperative spirit I believe will be a growing world of technology innovation, adoption of new techniques, incentives, appropriate incentives that change the investment opportunities for the public, and most of all, shared information and standards. Without sharing all of this and using it collectively, we are just going to be two nations separated by a common language.

I understand I'm allowed to take a couple of questions as long as they are the ones that I wrote out for people ahead of time and if you can read my writing.

#### DISCUSSION FOLLOWING THE REMARKS OF MICHAL MOORE

MR. CRANE: Could you comment a bit on how we are going handle this climate change issue?

MR. MOORE: How we are going to end the climate change issue?

MR. CRANE: How we are going to handle it. We see various targets mentioned, and –the one I will refer to is that we cannot allow the average global temperature to rise by more than three to four degrees centigrade.<sup>149</sup>

When we look at the oil sands technology today and use of coal technology, although you mentioned carbon capture and storage systems, as far as I know there are no commercially available systems at work anywhere in the world.<sup>150</sup> There are some experimental projects; I think one off the coast of Norway<sup>151</sup> and one in Germany at a small pilot plant.<sup>152</sup> There is discussion

<sup>144</sup> See Craik & DiMento, *supra*, note 34.

<sup>145</sup> See *id.*

<sup>146</sup> See *id.*; see also Shook, *supra*, note 136.

<sup>147</sup> See H. Hamilton Hackney, III & Alexander C. B. Barnard, *Bogged Down in Wetlands Appeals: Proposal for Reform*, 45 B.B.J. 6, 20 (2001).

<sup>148</sup> See Craik & DiMento, *supra*, note 34.

<sup>149</sup> See Victor B. Flatt, *Taking the Legislative Temperature: Which Federal Climate Change Legislative Proposal is Best?*, 102 NW. U. L. REV. COLLOQUY 123, 127 (2007); see also Jason Scott Johnston, *Problems of Equity and Efficiency in the Design of International Greenhouse Gas Cap-and-Trade Schemes*, 33 HARV. ENVTL. L. REV. 405 (2009).

<sup>150</sup> See generally Jeffrey W. Moore, *The Potential Law of On-Shore Geologic Sequestration of CO<sub>2</sub> Captured From Coal-Fired Power Plants*, 28 ENERGY L. J. 443, 451 (2007).

<sup>151</sup> See Karen N. Scott, *The Day After Tomorrow: Ocean CO<sub>2</sub> Sequestration and the Future of Climate Change*, 18 GEO. INT'L ENVTL. L. REV. 57, 61 (2005).

between the Alberta government and the Canadian government of investing in projects in Canada, but they are failing to develop a cost-effective system of carbon capturing storage.<sup>153</sup> What is the prospect for oil sands development if you assume that we have to do something about holding global temperature increase to some level?

MR. MOORE: So let me just take a piece of that and refer back to two of the talks this morning that had the concept of risk built into them. To do that, I'll borrow your word "we."

I do not have a clue who, "we" is, other than if it is the pricing system within the greater economy that is set up through regulators to recover some of the costs that are going to be needed to control carbon if you believe it is a problem. Right now the risk element for the general public is not felt at all. Go around and ask my students whether they feel at risk by increased concentrations of carbon dioxide in the air, they hear it from my colleagues and I in the Physics Department, and they generally believe it, but they do not know why. They keep opening cans of Coke even though they know it is a problem, but they cannot see it. It is not like smog in the Los Angeles Basin or more recently, smog in the foothills of the Rockies, and where is that coming from? You can see it and you know that it is probably a bad thing, but you are not totally convinced that carbon dioxide is that big of a problem.

So how do we get there? We look at short-term ways to try and control what we consider to be an initiator of broad climate changes, increased concentrations of carbon dioxide in the atmosphere.<sup>154</sup> In the short term, we can do that by some of the experimental projects that were mentioned.<sup>155</sup> We have an experimental project that is going on at the United States border with Saskatchewan, which is the reinjection of carbon dioxide for enhanced oil recovery primarily.<sup>156</sup> There is also a trans-Canada project to use pet coke

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<sup>152</sup> See *id.* at 61.

<sup>153</sup> See Alastair R. Lucas, *Challenges and Opportunities for Multinational Business Enterprises: Mythology, Fantasy and Federalism: Canadian Climate Change Policy and Law*, 20 PAC. MCGEORGE GLOBAL BUS. & DEV. L.J. 41, 45 (2007); see also Nigel Bankes, Jenette Poschwatta & E. Mitchell Shier, *The Legal Framework for Carbon Capture and Storage in Alberta*, 45 ALBERTA L. REV. 585 (2008).

<sup>154</sup> See F. Sherwood Rowland, *Atmospheric Changes Caused by Human Activities: From Science to Regulation*, 27 ECOLOGY L.Q. 1261 (2001); see also David S. Chapman & Michael G. Davis, *Global Warming – More Than Hot Air?*, 27 J. LAND RESOURCES & ENVTL. L. 59 (2007).

<sup>155</sup> See Alastair R. Lucas, *Challenges and Opportunities for Multinational Business Enterprises: Mythology, Fantasy and Federalism: Canadian Climate Change Policy and Law*, 20 PAC. MCGEORGE GLOBAL BUS. & DEV. L.J. 41, 45 (2007); see also Nigel Bankes, Jenette Poschwatta & E. Mitchell Shier, *The Legal Framework for Carbon Capture and Storage in Alberta*, 45 ALBERTA L. REV. 585 (2008).

<sup>156</sup> See Nigel Bankes, Jenette Poschwatta & E. Mitchell Shier, *The Legal Framework for Carbon Capture and Storage in Alberta*, 45 ALBERTA L. REV. 585, 590 (2008).

waste product from the oil sands to gasify it and create a substitute for using natural gas.<sup>157</sup>

My sense is that, and I have to say truthfully that I am at odds with a couple members in my department on this topic, carbon-capturing sequestration looks to me like a short-term solution, maybe fifty to seventy years.<sup>158</sup> Which, at that point you cannot inject enough of it into places to make it worthwhile, and this means, you need to go back to the source and stop generating as much as you are.<sup>159</sup> We need new technologies, especially in terms of power production, to make sure that it does not get in the air to start with, so you have to recover it at four and five times the cost that you would to control it before it got in the air.<sup>160</sup>

So first step is convince people there is a real risk, and that means convincing their representatives that they ought to be aware of it, ought to take action on the public's behalf because let us face it, the public has a short memory on these things.<sup>161</sup> Energy efficiency fails when it is a behavioral change, unless you invest in technologies that make it routine.<sup>162</sup> Trying to get behavior change for long-term climate change is probably not productive and not likely to involve a lot of failed systems.<sup>163</sup> So embedding the idea of it in the policymakers, and then getting them embed the same idea in the mind of the rule makers, to make it permanent in terms of technology is probably the only answer.<sup>164</sup> Long-term, the only answer is to attack it at the source, and not generate it, because it will just be too expensive to clean up at the end.<sup>165</sup>

MR. ULRICH: I apologize, because I misplaced the question that you gave me. However, I do have another one.

A little bit of a follow-up to the other gentleman's question and perhaps just one comment. I think if we need more real examples of the presence of climate change, I think that people should talk to those folks in New Orleans, who are still trying to recover from Katrina, and there are many more, particularly around the Great Lakes. However, you are right that it takes real

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<sup>157</sup> See generally Chantel Line Carpentier, *Nafta and its Environmental Side Agreement: Taking Stock @11*, 14 MICH. ST. J. INT'L L. 191, 209 (2006).

<sup>158</sup> See Victor B. Flatt, *Paving the Legal Path for Carbon Sequestration From Coal*, 19 DUKE ENVTL. L. & POL'Y F. 211 (2009).

<sup>159</sup> See generally *id.*

<sup>160</sup> See Hope M. Babcock, *Global Climate Change: A Civic Republican Moment for Achieving Broader Changes in Environmental Behavior*, 26 PACE ENVTL. L. REV. 1, 4 (2009).

<sup>161</sup> See Ann E. Carlson, *Heat Waves, Global Warming, and Mitigation*, 26 UCLA J. ENVTL. L. & POL'Y 169, 171 (2008).

<sup>162</sup> See Gregory N. Mandel, *Technology Wars: The Failure of Democratic Discourse*, 11 MICH. TELECOMM. TECH. L. REV. 117 (2005).

<sup>163</sup> See *id.*

<sup>164</sup> See *id.*

<sup>165</sup> See *id.* at 137.

events and something close to home. For example it woke people up forty years ago to what we did to the Great Lakes, when a river caught fire.<sup>166</sup>

However, I would like to hear a little bit more on how conversion and efficiency fit into your formula. I have no disagreement that energy is an important part of society in the future, but what I do not know, is how roughly thirty percent efficiency for a rural coal-fired power plant, will be sustainable in the future. The other thing is, if could you speak more about the renewable side of things? I did not hear as much as I might have liked to hear.

MR. MOORE: Okay. I recognized three questions there, and I will try to deal with them rapidly. The first question is whether our general efficiency, or manipulating the demand curve to become more elastic and responsive to price changes, is in our interest? This means that we have to find some mechanism by which consumers can understand what the cost of energy is when they use it. Right now we have a very aggregate billing system for most electric use,<sup>167</sup> for example if I asked you how much energy you used yesterday, you would not have a clue, and you would not have a clue until the end of the month, or even for another two weeks when you tried to figure out how much you used that month versus the month before. We do not have a good system for telling people what the cost is of the energy they use.<sup>168</sup>

Therefore, the first change that we have to make in the regulatory system is to develop better pricing information for consumers,<sup>169</sup> and I think we are getting there. However, I do not think better pricing will be as simple as developing smart meters. Personally, I do not want to sit at home watching my meter all day and then running in to turn off the clothes dryer as soon as the price spikes. Instead, I want an energy management tool or software tool to do that for me, and I also want to be able to program it with my preferences. For me, I do not care what the price is; run all of my machines at the same time, but only run them at the most efficient times. We need to be able to make good decisions, and right now we cannot make good decisions.<sup>170</sup> Industry does better when they have good bilateral deals of one kind or another, and it is worth it to them to make the change, which is why we need to improve the price tool.<sup>171</sup>

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<sup>166</sup> See Jonathan H. Adler, *Fables of the Cuyahoga: Reconstructing a History of Environmental Protection*, 14 FORDHAM ENVTL. LAW J. 89 (2002).

<sup>167</sup> See Todd A. Snitchler, *Maintaining the Status Quo: Electricity Utility Deregulation Difficulties in Ohio*, 49 CLEV. ST. L. REV. 647, 669 (2001).

<sup>168</sup> *Id.* at 662-667.

<sup>169</sup> See Edan Rotenberg, *Energy Efficiency in Regulated and Deregulated Markets*, 24 UCLA J. ENVT. L. & POL'Y 259, 265-269 (2006).

<sup>170</sup> See *id.*

<sup>171</sup> See Stephen L. Teichler & Ilia Levitine, *Realizing the Promise of Electricity Deregulation: Long-Term Power Purchase Agreements in a Restructured Electricity Industry*, 40 WAKE FOREST L. REV. 677, 678 (2005).

Second, in regard to the efficiency of coal plants I guess you can argue that because coal has been so cheap and the current technology, 1930s to 1950s technology, is so abundant, that it is just arisen because it was easy to do because you did not have air quality standards that you had to meet religiously, you did not have mercury standards and the like.<sup>172</sup> And as a consequence, you are able to pass on an externality of bad air effect to people who just cared about getting cheap energy.<sup>173</sup> My friend, Amory Lovins, a physicist, is fond of saying that nobody cares about energy; all they care about is cold beer.<sup>174</sup> So, if that is your outcome, then you are not going to worry about where it came from because you do not see any of those costs.

For me, the better example other than coal is natural gas, where, in my opinion, it is almost criminal to burn natural gas to produce power. That is not excusable, I mean it is cleaner, but price it higher, thus making it more attractive to clean up your coal production and burn that instead. Natural gas is too useful for other things, like producing fertilizer, or saving for future use.<sup>175</sup>

Finally, in regard to renewable energy, renewable energy is a curious duck. It is one of those things that we put a lot of energy into, no pun intended, into improving since the middle 1970s.<sup>176</sup> We have spent a lot of money on solar technology,<sup>177</sup> and we have managed to reduce the price of solar cells down from say ten times the cost of equivalent natural gas production to only five or six times that cost,<sup>178</sup> which is still not competitive.

Wind is competitive,<sup>179</sup> but it does not blow all the time. Geothermal power looks like it may have some advantages.<sup>180</sup> Methane gas from landfill production is relatively competitive in some markets, but only when it is

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<sup>172</sup> See David Gutierrez, *Research Shows Coal Burning Responsible for Arctic's Heavy Metal Pollution*, NATURAL NEWS.COM, March 16, 2009, available at [http://www.naturalnews.com/025853\\_coal\\_America\\_pollutants.html](http://www.naturalnews.com/025853_coal_America_pollutants.html).

<sup>173</sup> See David M. Driesen, *Law and Resources in the Era of Climate Change: Linkage and Multilevel Governance*, 19 DUKE J. COMP. & INT'L L. 389, 398 (2009).

<sup>174</sup> See Amory Lovins – Biography, Rocky Mountain Institute, <http://www.rmi.org/site/pages/pid56.php> (last visited Nov. 08, 2009).

<sup>175</sup> See Rep. Cliff Stearns, *U.S. Coal Reserves Key to national and Energy Security*, 19 STAN. L. & POL'Y REV. 426, 429 (2008).

<sup>176</sup> See Committee Report, *Report of the Renewable Energy Committee*, 29 ENERGY L. J. 269, 269 (2008) (discussing the investments into renewable energy beginning in the 1970's).

<sup>177</sup> See Andrew P. Morriss, et al., *Green Jobs Myths*, 16 MO. ENVTL. L. & POL'Y REV. 326, 365 (2009).

<sup>178</sup> See Jessika Ebba Trancik, *Photovoltaics – A Niche-Market Distraction or a Global Energy Solution*, 11 GEO. PUBLIC POL'Y REV. 69, 69 (2006).

<sup>179</sup> See Christine Real de Azua, *The Future of Wind Energy*, 14 TUL. ENVTL. L.J. 485 (2001) (commenting on the immense potential of wind energy in the North American market).

<sup>180</sup> See Donald J. Kochan & Tiffany Grant, *In the Heat of the Law, It's Not Just Steam: Geothermal Resources and the Impacts on Thermophile Biodiversity*, 13 HASTINGS W.-N.W. J. ENV. L. & POL'Y 35 (2007).

close enough to those markets.<sup>181</sup> Basically, what we do is pit renewable technologies against the older established technologies and let them compete.<sup>182</sup> However, they cannot compete, because the wind does not blow all the time, the sun does not shine all the time, and they are expensive because they are not deployed as widely, and therefore pre-unit costs remain high.<sup>183</sup> We do not integrate them well.<sup>184</sup>

The regulatory institutions can make a great difference here,<sup>185</sup> and frankly the real difference will come, and for those of you who do not work in the electric world, this may be a surprise, with the independent systems operators, the dispatchers, who read the signals and say all right, "we are going to need more energy between noon and two, we will use this type of technology, we will fire them up and run the electrons out, and it is so much easier to use your thermal dispatch rather than the renewable alternatives." However, they do not have the incentive to do it. So, in a sense, we have all the software tools, the management tools, and the right prices to start combining these technologies.<sup>186</sup> Once we imagine that we can do it, we will see that there are technologies and resources that can make a difference in standing down some of the traditional and easy technologies to get out.<sup>187</sup>

One example is that we are looking at hydro resources, available in northern Alberta.<sup>188</sup> The question is can we ship hydro resources via a high voltage, direct, current line to a market that needs it, like Scottsdale or Phoenix, Arizona?<sup>189</sup> The answer is, as far as economics and resources go, absolute-

<sup>181</sup> See Blake M. Mensing, *Exploring How Today's Development Affects Future Generations Around the Globe: Aquaponics & Landfill Methane Use: These Fetid Miasmata Smell Like Profitable Conservation*, 9 SUSTAINABLE DEV. L. & POL'Y 11 (2009) (discussing the advantages of and limitations in transporting landfill methane).

<sup>182</sup> See Benjamin K. Sovacool & Christopher Cooper, *State Efforts to Promote Renewable Energy: Tipping the Horse with the Cart*, 8 SUSTAINABLE DEV. L. & POL'Y 5 (2007).

<sup>183</sup> See generally Steven Ferrey, *Corporate Governance and Rational Energy Choices*, 31 WM. & MARY ENVTL. L. & POL'Y REV. 113 (2006).

<sup>184</sup> See Joel B. Eisen, *The Environmental Responsibility of the Regionalizing Electric Utility Industry*, 15 DUKE ENVTL. L. & POL'Y F. 295, 301 (2005).

<sup>185</sup> See Ursula Kazarian, *Opportunities and Challenges in Global Clean Technology: Evolving U.S. Clean Tech: Legislative Trends*, 9 SUSTAINABLE DEV. L. & POL'Y 48 (2009).

<sup>186</sup> *Id.* at 49-50.

<sup>187</sup> See Valerie J. Faden, *Net Metering of Renewable Energy: How Traditional Electricity Suppliers Fight to Keep You in the Dark*, 10 WIDENER J. PUB. L. 109 (2000).

<sup>188</sup> See F. Michael Cleland & David J. Manning, *Securing the Energy Supply in North America*, 29 CAN.-U.S. L.J. 307, 311 (2003).

<sup>189</sup> See Olino Renewable Energy, *A North American Energy Plan for 2030: Hydro-electricity the Forgotten Renewable Energy Resource*; <http://www.olino.org/us/articles/2009/06/15/a-north-american-energy-plan-for-2030-hydro-electricity-the-forgotten-renewable-energy-resource> (last visited Nov. 8, 2009) (weighing the possibility of expansion of the Canadian hydro energy infrastructure by the year 2030).

ly.<sup>190</sup> It is not a slam-dunk, but it can be done. However, one problem is that Alberta does not allow exportation of electricity, because they do not want Americans to capture their market.<sup>191</sup> It is easy for me to say, as an American, that that is just silly, but it is true in the policy arena. We have to crack this before we can even imagine using some of these tools and some of these technologies in a wider way. So it is not always the most obvious or logical solution that is going to win out, because we also have policy and cultural issues to overcome in addition to the economics.<sup>192</sup> In order to get the right means we have to get to the regulators, not the policymakers.<sup>193</sup> We do not need more mud thrown in the water. We need the regulators to be working together and harmonize the rules in order to make it easier share these technologies and power.<sup>194</sup>

MR. BROOKS: I am David Brooks from Friends of the Earth Canada, and I am also a devotee of Amory Lovins, whom you mentioned.

I want to follow on with this issue of energy conservation and efficiency. I was director of Canada's Office of Energy Conservation throughout the 1970s,<sup>195</sup> and we found enormous ways to change energy use on the demand side, except in transportation.<sup>196</sup> We could not figure out a way to make enormous changes in energy use for transportation. You can improve the efficiency of an engine, you can shift fuel types, and so on, but compared to what can be done in heating or electricity, it was around the edges.

I would like to hear your suggestions. There are some qualms about how much land in Alberta we want to give up to oil sands, whether we want to spend two to four barrels of water for every barrel of oil, and it is a consumptive use of water. There are some limits that exist, not just with the availability of tar sands oil, but also with alternate transportation fuel. So, what can we do in that sector?

MR. MOORE: Let me start at the back end of that, and touch on something I meant to say in my remarks. Energy, especially for power use, is

<sup>190</sup> See *id.*

<sup>191</sup> See Peter Bowal, *Canadian Water: Constitution, Policy, and Trade*, 2006 MICH. ST. L. REV. 1141, 1149 (2006) (discussing Canada's long standing policy of limiting any water exports).

<sup>192</sup> See Jeffrey W. Knapp, *Effective State Regulation of Energy Utility Diversification*, 136 U. PA. L. REV. 1677, 1681-82 (1988).

<sup>193</sup> See *id.*

<sup>194</sup> See *id.*

<sup>195</sup> See David Brooks – Biography, East Tennessee State University, <http://www.etsu.edu/cass/Archives/Collections/afindaaid/a601.html> (last visited Nov. 8, 2009).

<sup>196</sup> See Christopher J. Barr, *Growing Pains: FERC's Responses to Challenges to the Development of Oil Pipeline Infrastructure*, 28 ENERGY L. J. 43, 46 (2007) (evaluating how oil pipeline infrastructure has paramount importance on energy concerns, even though pipelines are out of the public consciousness).

water consumptive;<sup>197</sup> whether it is for cooling or, in the case of energy generation in the oil sands, whether the tailing water, stored in large lakes with surface areas close to the size of Connecticut, is not a trivial event.<sup>198</sup> Especially if one of the tailing pond's dikes break, which they probably will, and floods the Athabasca River, causing heavy metals and methanogenic acids to leak into the Arctic Ocean, and then to the Atlantic and Pacific.<sup>199</sup> It will not be a trivial disaster, and it is one that is likely to involve a great deal of gnashing of teeth and tedious lawsuits.<sup>200</sup>

Water use is intimately connected with energy use,<sup>201</sup> and it is a relationship that we have to take into account as we look at the cross-border energy flows.<sup>202</sup> Currently, we do not do a very good job. All the regulators are set up to do different things right now.<sup>203</sup> There are water regulators, electricity regulators, gas regulators, and environmental regulators, with very little unity in between.<sup>204</sup>

Now to address the point on energy conservation for example, in Alberta last year the gas price rose from a \$0.80 a liter to a \$1.40 a liter<sup>205</sup> over two-and-a-half weeks,<sup>206</sup> people started parking their RV's and SUV's in front of the Premiere's house with the keys in the ignition, saying, "I am not doing this anymore, I cannot take that kind of a cost for gasoline."<sup>207</sup>

Demand fell for about three weeks,<sup>208</sup> and then they looked around, to get the keys back and drive again, because it worked itself out. In transportation, there is not a lot of resiliency from demand reduction.<sup>209</sup> People need trans-

<sup>197</sup> See P. TORCELLINI, ET AL., CONSUMPTIVE WATER USE FOR U.S. POWER PRODUCTION (2003), available at <http://www.nrel.gov/docs/fy04osti/33905.pdf>.

<sup>198</sup> See *id.*

<sup>199</sup> See Chris Hudson, *The Role of International Environmental Law in the Protection of the Danube River Basin: the Baia Mare Cyanide Spill*, 12 COLO. J. INT'L ENVTL. L. & POL'Y 367 (2001) (discussing the negative environmental effects of the Baia Mare cyanide spill).

<sup>200</sup> See *id.*

<sup>201</sup> See Adell Amos, *Freshwater Conservation in the Context of Energy and Climate Policy: Assessing Progress and Identifying Challenges in Oregon and the Western United States*, 12 U. DENV. WATER L. REV. 1 (2008) (discussing how water laws and regulations should not continue to be analyzed independently of energy concerns).

<sup>202</sup> See *id.*

<sup>203</sup> See Nelson D. Cary, *A Primer on Federal Facility Compliance with Environmental Laws: Where Do We Go From Here?*, 50 WASH & LEE L. REV. 801 (1993) (noting that the environmental regulatory scheme allows for many offenders, particularly at the federal level, to avoid punishment for non-compliance).

<sup>204</sup> See *id.*

<sup>205</sup> See *Canada Energy Usage Soared Prior to 2008 Price Spike*, CANWEST NEWS SERVICE, Nov. 18, 2008, available at <http://www.canada.com/Business/story.html?id=970107> (last visiting Nov. 8, 2009).

<sup>206</sup> See *id.*

<sup>207</sup> See *id.*

<sup>208</sup> See *id.*

<sup>209</sup> See Daniel Ramish, *Government Regulatory Initiatives Encouraging the Development*



portation, and fuel turns out to be one of the lower variable costs of running a car.<sup>210</sup> Let us face it, you pay a lot for leases and you pay a lot for the capital cost.<sup>211</sup> Over the lifetime of the vehicle, gas costs will not really impede your behavior.<sup>212</sup> You can get dramatic savings in homes and businesses largely because you embed the new capital costs in a facility that has a long life to it, and once you embed it you forget about and it keeps going on.<sup>213</sup>

The bottom line is we do not price things efficiently.<sup>214</sup> If we did, we never would have the kind of fuel standards that we have for automobiles lasting as long as they are.<sup>215</sup> We never would have believed the collective fiction that a fleet average fuel standard helped me with this: How many people still believe in the tooth fairy and believe that average fuel economy for a fleet does anything for the real mileage that a consumer takes in over the life of the vehicle? We don't price things very well.<sup>216</sup> We have been afraid to attack industry as though attacking industry and putting a standard on would result in a loss of business.<sup>217</sup> Now think of how silly that is. I just heard one of the chairmen of a very large energy company in Calgary say if you impose environmental standards on my business, we will go out of business, and the whole industry will die. Help me out. What happens is if you impose a standard that is broad and all encompassing for energy use, everybody is going to have to meet the standard.<sup>218</sup> Some companies that can't

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*and Sale of Gas/Electric Hybrid Vehicles: Transforming Hybrids from a Curiosity to an Industry Standard*, 30 WM. & MARY ENVTL. L. & POL'Y REV. 231 (2005); see also Samantha A. Krasner, *America's Addiction to Oil: A Comprehensive Strategy for Reducing Our Nation's Dependence*, 40 CONN. L. REV. 209 (2007).

<sup>210</sup> See *id.*

<sup>211</sup> See *id.*

<sup>212</sup> See *id.*

<sup>213</sup> See Judi Brawer & Matthew Vespa, *Thinking Globally, Acting Locally: The Role of Local Government in Minimizing Greenhouse Gas Emissions From New Development*, 44 IDAHO L. REV. 589, (2008) (discussing how local governments can use tax incentives to offset initial building costs of green buildings, which reduce future energy costs).

<sup>214</sup> See Matthew J. Libby, *Deregulating the Electricity Market: What Can Be Learned From California's Mistakes*, 22 MAINE BAR J. 236, 239 (2007) (explaining the inefficiencies in pricing caused by tension between regulatory pricing solutions and investor owned utility pricing solutions).

<sup>215</sup> See Christopher Flavin, *Fordham Environmental Law Review Fifteenth Annual Symposium Energy and Climate Change: North and South Perspectives*, 19 FORDHAM ENVTL. LAW REV. 231, 234-35 (2009).

<sup>216</sup> See *id.*

<sup>217</sup> See Joel B. Eisen, *The Environmental Responsibility of the Regionalizing Electric Utility Industry*, 15 DUKE ENVTL. L. & POL'Y F. 295, 300 (2005); see also Robert C. Fellmeth, *Plunging Into Darkness: Energy Deregulation Collides with Scarcity*, 33 LOY. U. CHI. L.J. 823, 825-30 (2002) (noting how deregulating the utility industry has negative impacts on consumer pricing and industry competition).

<sup>218</sup> See *id.*

adapt quickly enough will go out of business,<sup>219</sup> and so what? Their investors invested in the wrong company. The others will survive and prosper, and there will be shifts in the economy. The economy doesn't die because you put on standards.<sup>220</sup> The economy starts to die because you don't regulate the bad guys, and you don't put them in jail;<sup>221</sup> and they tube your economy because they undermine the rules, not because we don't have efficient enough standards.<sup>222</sup> So if we price it right, we get the standards so they are equitably applied across the board.<sup>223</sup> And we emphasize the benefits of energy efficiency and demand reduction, I think we get the benefit, so do they, and long-term we get a better way to conserve resources.<sup>224</sup> Thank you for having me.

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<sup>219</sup> See *id.*

<sup>220</sup> See *id.*

<sup>221</sup> See Robert Lenzner, *Bernie Madoff's \$50 Billion Ponzi Scheme*, FORBES, Dec. 12, 2008, [http://www.forbes.com/2008/12/12/madoff-ponzi-hedge-pf-ii-in\\_rl\\_1212croesus\\_inl.html](http://www.forbes.com/2008/12/12/madoff-ponzi-hedge-pf-ii-in_rl_1212croesus_inl.html) (last visited Nov. 8, 2009).

<sup>222</sup> See Barbara Crutchfield George, et al., *The Opaque and Under-Regulated Hedge Fund Industry: Victim or Culprit in the Subprime Mortgage Crisis*, 5 N.Y.U. J. L. & BUS. 359 (2009) (discussing if regulation and industry standards could have helped to avoid the United States subprime mortgage crisis).

<sup>223</sup> See Libby, *supra*, note 214 at 239.

<sup>224</sup> See *id.*

