

## **LESSON 3 The Kyoto Protocol and Energy Security of Supply**

### **ABSTRACT**

The focus of Lesson 3 is on evaluating the validity and success of the Kyoto Protocol, and exploring possible alternatives and new strategies to combat climate change beyond 2012. The intent is to provoke thinking about the level and type of participation required for measures intended to mitigate emissions; the rights and obligations of countries; the participation of developing countries; the taxonomy of rules and guidelines for target-setting; and the options for supporting policy instruments. Based on a brief survey of these issues, the critical question should again be explored: Can an L20 effectively address the deadlock?

### **BACKGROUND**

The Kyoto Protocol to the United Nations Framework Convention on Climate Change came into force in 2005 without US participation. The Protocol is a first step. Its impacts on emissions of greenhouse gases will be trivial; its ambitious targets apply only to 2012 and only to industrialized nations. Kyoto is criticized as imposing relatively high costs and generating only modest short-term benefits. It does not provide a real solution. An effective approach must ensure coverage of the principal emitters including the US and the developing countries. The solution must stress cost effectiveness over a long time horizon, and highlight tradable permits and carbon taxes.

Climate change is contentious for a multitude of reasons. The technologies that supply the world's energy cannot be quickly or inexpensively replaced. There are powerful and diverse industrial interests at stake including internationally oriented energy-intensive industries, the power production sector, fossil fuel producers and the agricultural industry.

A system of tradable permits was used in the United States to phase out leaded gasoline in the 1980s at a savings of more than \$250 million per year over an equivalent traditional regulatory approach (Robert N. Stavins 2003). The system is now used to cut sulfur dioxide (SO<sub>2</sub>) emissions from power plants by half, at an annual cost savings of \$1 billion (A. Denny Ellerman et al. 2000).

For some countries, systems of domestic carbon taxes may be more attractive, and a particularly promising approach is a hybrid of tax and tradable-permit systems — an ordinary tradable permit system, plus a government promise to sell additional permits at a stated price (McKibbin and Wilcoxon 2002; William A. Pizer 2002). This addresses cost uncertainty by creating a price ceiling (and thereby a cost ceiling), and has hence been labeled a safety-valve approach.

Despite mounting evidence and consensus around human caused shifts in the climate, the global policy response to the issue remains fragmented and ineffective. The Kyoto Protocols represent a tentative first step toward realizing a global consensus on action on

global warming. The protocols cover reductions in gaseous emissions. There have been criticisms of Kyoto on the basis that it provides an uneven playing field, economically favoring states that are not party to the protocols. Where integrated markets span countries, there is a concern unfair competitive advantages may be created, depending on the pattern by emissions reduction commitments are allocated to which industries.

An effective, politically sustainable deal to control emissions must consider:

- Geography – Broader participation is needed - notably, participation by the United States and key developing countries such as China and India. An effective approach would engage these nations to make credible long-term commitments.
- Geometry – There must be more on the table than simply targets to cut emissions. Actions must span many issue-areas, as different countries have widely varied interests and priorities.
- Arithmetic – The discussion must engage a smaller number of players who have a higher “level” of political status. .
- Timing – Realizing that the Kyoto architecture is an important accomplishment for many nations, it is important to maintain the current momentum to reach post 2012 commitments.
- Sensitivity to Cost – Attention to cost is essential for political sustainability. Therefore, an experimental approach, where different cost-sensitive schemes were brokered and tested, may be more efficient than the Kyoto approach.
- Long-term goals - A final destination and an accompanying compass for action is necessary. Clear goals would send credible signals about the need for innovation in new technologies.

The question is how each jurisdiction determines the relative merits of “price”, “quantity”, and “regulatory” instruments. Instruments include carbon taxes, emission caps with trading, renewable portfolio standards, and sundry other measures.

There are competing approaches. Conceptually one can work only on price directly – using taxes and subsidies. One can try to control quantities, rationing fuels or legislating maximum volumes of emissions. . Others argue that the only practical route to secure the engagement of developing countries. The “safety valve” is a hybrids approach, combining an emission trading system with a device that limits the cost of compliance. This approach offers greater surety about the cost of an emission control program. Yet another approach would emphasize investing in R&D and technology-focused cooperatives (e.g. as is under way already for coal, hydrogen, and nuclear power), claiming that technological change offers the only politically acceptable escape

To help reduce the cost of meeting reduction commitments three market-based “flexible mechanisms” were designed: Emissions Trading (ET), Joint Implementation (JI) and the Clean Development Mechanism (CDM). While different in operation, the three mechanisms are based on the same principle: industrialized countries should be allowed to reduce emissions wherever in the world those reductions are cheapest, and then count those reductions towards their national target. JI and the CDM are called the “project-based” mechanisms because they fund actual projects; JI generally funds projects in Eastern

Europe and the former Soviet Union, while CDM projects can only happen in developing countries which do not have an emissions reduction target under the Kyoto Protocol. As such, the CDM is the only part of the Kyoto Protocol which directly involves developing countries in reducing greenhouse gas emissions. The CDM is also different in that emission reduction credits that are generated by CDM projects before the period 2008-2012 can be counted as reductions in that five year period.

Establishing an effective means of technology diffusion is another route to securing the participation of developing countries. Diffusion of technologies would involve new arrangements for regulation of the nuclear fuel cycle and promotion of nuclear power, as well as collective investment in new coal technologies.

The presumption is that the successor arrangement to Kyoto will be a broader package-oriented approach rather than a focus on a single set of instruments and commitments. Some nations will favor arrays of direct interventions such as standards for renewable power and energy efficiency, while others may prefer just broader performance goals such as emission caps or market instruments such as emission taxes. The complexities of a new approach are plentiful. It is unclear what principles and criteria should guide the approach. Target levels of atmospheric concentration or carbon intensity will have to be agreed. An ideal arrangement would ensure early commitments and the flexibility to adjust approaches with experience.

### **Lesson Plan**

Watch the video <http://www.l20.org/publications/2-Climate.mov> where David Victor, Director, Program on Energy and Sustainable Development, Stanford University reports to Prime Minister Paul Martin on a Council on Foreign Relations meeting in September 2004 on the prospects for the climate change as an L20 agenda topic.

Appraise the institutions concerned, the IPCC (<http://www.ipcc.ch/>) and the CDM (<http://cdm.unfccc.int/>). Check out the “hockey stick”.

[http://www.grida.no/climate/ipcc\\_tar/wg1/069.htm](http://www.grida.no/climate/ipcc_tar/wg1/069.htm)

Conspiracy theorists should read Michael Crichton’s “State of Fear”.

Discuss the 2005 Gleneagles G8 Plan of Action

([http://www.fco.gov.uk/Files/kfile/PostG8\\_Gleneagles\\_CCChangePlanofAction.pdf](http://www.fco.gov.uk/Files/kfile/PostG8_Gleneagles_CCChangePlanofAction.pdf))

Review the concepts and options in play:

- “Cap and trade systems” <http://www.canadawebpages.com/pc-editorial.asp?Key=2342&editorPrimeKeyword=morrow&editorType=article&editorLink=morrow>

- Carbon taxes <http://www.cbc.ca/news/background/kyoto/carbon-tax.html>

- Nuclear energy [http://www.l20.org/publications/16\\_Mi\\_ES\\_Richter.pdf](http://www.l20.org/publications/16_Mi_ES_Richter.pdf)

- Conservation

- Renewable energy (hydro, solar, wind, tidal, geothermal, bio fuels).

- Carbon sequestration ([http://ess.nrcan.gc.ca/2002\\_2006/rcvcc/j31/4\\_e.php](http://ess.nrcan.gc.ca/2002_2006/rcvcc/j31/4_e.php))

Assess the National Roundtable on the Environment and Economy prescription for Canada. <http://www.nrtee-trnee.ca/eng/publications/wedge-advisory-note/ecc-wedge-advisory-note-eng.pdf>

Discuss the common concerns and grounds for cooperation that could be a foundation for L20 cooperation on energy and climate change. Review the potential declaratory and action elements from the list of 25 in discussion Question 3 below.

### **Discussion Questions:**

1 What types of principles would need to be established to guide any efforts within an L20 forum to address the issue of climate change and work to create a more inclusive and effective post-Kyoto accord?

2. While the CDM could become an important force it is criticized as being tied in red tape with no substitute for devising a means of getting developing countries to undertake GHG emissions reduction commitments of their own. How can the CDM be made more effective?

3. Assume an L20 Summit meeting was designed to engage key developing countries. Imagine an energy and environmental security paradigm attractive to both developed and developing countries. Some illustrative declaratory and action measures are listed below:

**A. Declaratory** Could L-20 members come to an agreement on any of the following preambular statements?

1. Ensuring clean approaches to energy is an important global goal and such a process will have a significant impact on the development agenda.
2. Innovation and technology diffusion is critical to provide a sustainable strategy for long-term reduction of emissions and better sources of energy.
3. Achieving a balance between industrialization and protecting the environment is imperative.
4. Attention to cost is essential for politically sustainable options.
5. A long-term approach is difficult but necessary, monitoring and reviewing will allow for progress and adjustments.
6. Focusing on the overall net effect of national programs rather than setting strict goals will produce more flexible and sustainable strategies.

**B. Action** Could L-20 members agree to a win-win package based a selection of the 25 actions below?

1. Refine a framework, based on the principles gains from trade, progressivity, and protection against inadvertent stringency;
2. Rationalize policies in the agriculture, industry, energy, development and finance sectors so to have an overall focus on the concept of energy and environmental security
3. Use intensity targets to frame a sequence of emission targets;

4. Maintain principles of progressivity and insurance, without penalizing countries unduly for their success;
5. Devise formulae (like the Argentine proposal) where adjustment is both proportionate and also where targets are less than proportionate;
6. Include a mechanism for voluntary accession of developing countries re binding commitments;
7. Develop "growth targets" that would become more stringent for individual countries as they become more wealthy (a trigger mechanism whereby countries would be obligated to take on binding commitments once their per capita gross domestic product reached agreed levels);
8. Provide a one-time sinks credit adjustment for the US for the 2008-2012 timeframe; and
9. Include compensated reductions for preventing deforestation (within the UNFCCC logic).
10. Send credible signals on the need for innovation of new technologies
11. Support explicit technology-focused cooperatives (e.g., as is under way already for coal, hydrogen, and nuclear power), in addition to credible limits on emissions (or emission taxes) so that firms face private incentives to deploy new technologies, as well as for collective investments in carbon sequestration and advanced coal-burning technologies
12. Review the Clean Development Mechanism (CDM) of the Kyoto Protocol so that it better encourages developing countries to reduce their emissions of greenhouse gases
13. Draw on institutions that can monitor and review progress and help to focus readjustment of long-term goals.
14. Instruct their trade Ministers to work together within the Doha trade round to replace food production subsidies with incentives for farmers to grow environmentally beneficial bio fuel crops.
15. Ask the World Bank and the OECD to determine what barriers to clean energy currently exist in our countries and how they might be overcome;
16. Agree to a process of non binding peer review of country-specific studies for each L20 nation within two years;
17. Ask the WTO to recommend an offset package (loans, guarantees or other assistance from countries whose companies would benefit from improved market access).
18. Instruct their Finance Ministers, with the assistance of the IMF, to introduce, as appropriate, fiscally neutral GHG taxes, to be harmonized with the design of an internationally agreed tradable permit framework;
19. Retain the option of a "safety-valve system", that is, national tradable permit systems with government promise to sales of additional permits at a stated price (and thereby cost) ceiling, until 2025;
20. Implement domestic progressive taxes on GHG emissions, revenues will accrue to the government of each country where the emissions occur, reinforcing incentives and the market based targets approach;
21. Provide mechanisms for phasing in even fiscally neutral taxes, starting low and gradually rising;

22. Instruct their Environment Ministers to explore international quantity standards, to be harmonized with the design of an international tradable permit program;
23. Direct their Energy Ministers to propose a schedule of ambitious but practical renewable energy standards, to encourage a high proportion of new electric capacity to come from non-hydroelectric renewable energy by 2012;
24. Initiate a process for evaluating the feasibility of quantitative bio fuel standards and targets for transportation;
25. Fund in-depth national impact assessments of how global warming would affect security, environment or economy.

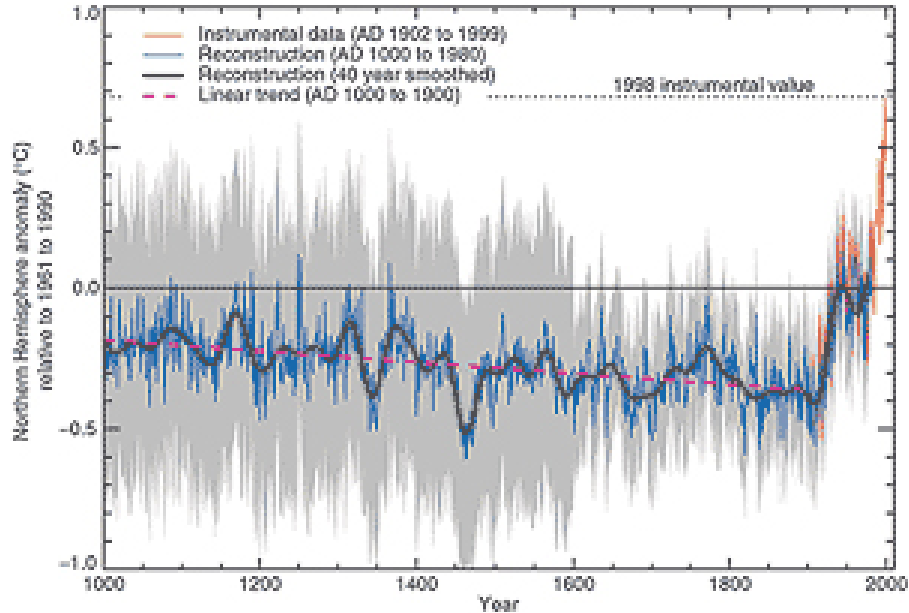
4) In November 2005 G8 Energy and Environment Ministers met with ministers from 12 other countries - Australia, Brazil, China, India, Indonesia, Mexico, Nigeria, Poland, South Africa, South Korea, and Spain. The anodyne Chairman's Conclusions reported the Ministers agreed "we should take forward and deepen our discussions on climate change, clean energy and sustainable development. We noted that Ministers and officials with other responsibilities, including for development and finance, might wish to become involved in taking forward discussion of relevant topics, including adaptation" and welcomed the offer from Mexico to host a Ministerial meeting of this Dialogue in 2006.

[http://www.g8.utoronto.ca/environment/env\\_energy051101.htm](http://www.g8.utoronto.ca/environment/env_energy051101.htm)

Question: Can we expect L20 leaders to be more substantive?

### **Recommended Web Based Resources:**

For the famous "hockey stick", purporting to demonstrate the spike in global warming:



**Figure 2.20:** Millennial Northern Hemisphere (NH) temperature reconstruction (blue) and instrumental data (red) from AD 1000 to 1999, adapted from Mann et al. (1999). Smoother version of NH series (black), linear trend from AD 1000 to 1850 (purple-dashed) and two standard error limits (grey shaded) are shown.

[http://www.grida.no/climate/ipcc\\_tar/wg1/069.htm](http://www.grida.no/climate/ipcc_tar/wg1/069.htm)

The Kyoto Protocol

<http://unfccc.int/resource/docs/convkp/kpeng.html>

David G Victor, Barry Carin, and Margaret Winterkorn-Meikle.

“Climate Change at the L20? Overview of the Issues”.

<http://www.l20.org/publications/Phase%20II/Climate%20Policy/background.pdf>

Olmstead & Stavins *An International Architecture for the Post-Kyoto Era* March 2006

KSG Working Paper No. RWP06-009

[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=902371](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=902371)

Browne, John. “Beyond Kyoto.” *Foreign Affairs*. July/August 2004

<http://www.foreignaffairs.org/20040701faessay83404-p0/john-browne/beyond-kyoto.html>

Cosbey, Aaron. (2005) *Climate Change and Competitiveness: A Survey of the Issues*.

[http://www.iisd.org/pdf/2005/climate\\_change\\_comp.pdf](http://www.iisd.org/pdf/2005/climate_change_comp.pdf)

Oppenheimer, Michael and Annie Petsonk.

*Reinvigorating the Kyoto System and Beyond: Maintaining the Fundamental Architecture, Meeting Long Term Goals.*

[http://www.l20.org/publications/6\\_Hr\\_climate\\_oppenheimer.pdf](http://www.l20.org/publications/6_Hr_climate_oppenheimer.pdf)

Sugiyama, Tangen, Hasselknippe, Michaelowa, Drexhage, Pan, Sinton and Moe. (2004)  
*Where to next? Future steps of the global climate regime.*

[http://www.iisd.org/pdf/2005/climate\\_where\\_to\\_next.pdf](http://www.iisd.org/pdf/2005/climate_where_to_next.pdf)

Victor, David G. *Roles for a G20 in Addressing the Threats of Climate Change.* February 2004. IDRC, [http://www.l20.org/publications/24\\_ix\\_g20\\_ottawa\\_victor.pdf](http://www.l20.org/publications/24_ix_g20_ottawa_victor.pdf)

CFGS/CIGI *Summary of Meeting Notes, September 20-21, 2004.*

*Leaders' Summit on Post-Kyoto Architecture: Toward an L20.*

[http://www.l20.org/publications/Phase%20II/Climate%20Policy/L20\\_NYC\\_Summary.pdf](http://www.l20.org/publications/Phase%20II/Climate%20Policy/L20_NYC_Summary.pdf)

CDM [http://www.cdmwatch.org/cdm\\_toolkit.php](http://www.cdmwatch.org/cdm_toolkit.php)

CDM Critique: Centre for Science and Environment

[http://www.cseindia.org/programme/geg/briefing\\_kyoto6.htm](http://www.cseindia.org/programme/geg/briefing_kyoto6.htm)

Nigel Purvis, *Options for Non-Emission Target Commitments: Climate Change and the L20* [http://www.l20.org/publications/6\\_4c\\_climate\\_purvis.pdf](http://www.l20.org/publications/6_4c_climate_purvis.pdf)