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Final Draft of Kyoto Protocol to U.N. Climate Change
Convention
Issued Dec. 10, 1997

CONFERENCE OF THE PARTIES

Third session

Kyoto, 1-10 December 1997

Agenda item 5

FCCC/CP/1997/CRP.6

10 December 1997

ENGLISH ONLY

KYOTO PROTOCOL TO THE
UNITED NATIONS FRAMEWORK CONVENTION
ON CLIMATE CHANGE

Final draft by the Chairman of the Committee of the Whole

The Parties to this Protocol,

Being Parties to the United Nations Framework convention on Climate Change,
hereinafter referred to as "the Convention",

In pursuit of the ultimate objective of the Convention as stated in its Article 2,

Recalling the provisions of the Convention,

Being guided by Article 3 of the Convention,

Pursuant to the Berlin Mandate adopted by decision 1/CP.1 of the Conference
of the Parties to the Convention at its first session,

Have agreed as follows:

Article 1

For the purposes of this Protocol, the definitions contained in Article 1 of the
convention shall apply. In addition:

1. "Conference of the Parties" means the Conference of the Parties to the
Convention.
2. "Convention" means the United Nations Framework Convention on Climate
Change, adopted in New York on 9 May 1992.
3. "Intergovernmental Panel on Climate Change" means the Intergovernmental
Panel on Climate Change established in 1988 jointly by the World
Meteorological Organization and the United Nations Environment Programme.

4. "Montreal Protocol" means the Montreal Protocol on Substances that Deplete the Ozone Layer, adopted in Montreal on 16 September 1987 and as subsequently adjusted and amended.

5. "Parties present and voting" means Parties present and casting an affirmative or negative vote.

6. "Party" means, unless the context otherwise indicates, a Party to this Protocol.

7. "Party included in Annex I" means a Party included in Annex I to the Convention, as may be amended, or a Party which has made a notification under Article 4, paragraph 2(g), of the Convention.

Article 2

1. Each Party included in Annex I in achieving its quantified emission limitation and reduction commitments under Article 3, in order to promote sustainable development, shall:

(a) Implement and/or further elaborate policies and measures in accordance with its national circumstances, such as:

(i) Enhancement of energy efficiency in relevant sectors of the national economy;

(ii) Protection and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol; taking into account its commitments under relevant international environmental agreements; promotion of sustainable forest management practices, afforestation and reforestation;

(iii) Promotion of sustainable forms of agriculture in light of climate change considerations;

(iv) Promotion, research, development and increased use of new and renewable forms of energy, of carbon dioxide sequestration technologies and of advanced and innovative environmentally sound technologies;

(v) Progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors that run counter to the objective of the Convention and apply market instruments;

(vi) Encouragement of appropriate reforms in relevant sectors aimed at promoting policies and measures which limit or reduce emissions of greenhouse gases not controlled by the Montreal Protocol;

(vii) Measures to limit and/or reduce emissions of greenhouse gases not controlled by the Montreal Protocol in the transport sector;

(viii) Limitation and/or reduction of methane through recovery and use in waste management, as well as in the production, transport and distribution of energy;

(b) Cooperate with other such Parties to enhance the individual and combined effectiveness of their policies and measures adopted under this Article,

pursuant to Article 4, paragraph 2(e)(i), of the Convention. To this end, these Parties shall take steps to share their experience and exchange information on such policies and measures, including developing ways of improving their comparability, transparency and effectiveness. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session or as soon as practicable thereafter, consider ways to facilitate such cooperation, taking into account all relevant information.

2. The Parties included in Annex I shall pursue limitation or reduction of emissions of greenhouse gases not controlled by the Montreal Protocol from aviation and marine bunker fuels, working through the International Civil Aviation Organization and the International Maritime Organization, respectively.

3. The Parties included in Annex I shall strive to implement policies and measures under this Article in such a way as to minimize adverse effects, including the adverse effects of climate change, effects on international trade, and social, environmental and economic impacts on other Parties, especially developing country Parties and in particular those identified in Article 4, paragraphs 8 and 9 of the Convention, taking into account Article 3 of the Convention. The Conference of the Parties serving as the meeting of the Parties to this Protocol may take further action, as appropriate, to promote the implementation of the provisions of this paragraph.

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol, if it decides that it would be beneficial to coordinate any of the policies and measures in paragraph 1(a) above, taking into account different national circumstances and potential effects, shall consider ways and means to elaborate the coordination of such policies and measures.

Article 3

1. The Parties included in Annex I shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of this Article, with a view to reducing their overall emissions of such gases by six per cent below 1990 levels in the commitment period 2008 to 2012.

2. Each Party included in Annex I shall, by 2005, have made demonstrable progress in achieving its commitments under this Protocol.

3. The net changes in greenhouse gas emissions from sources and removals by sinks resulting from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation, and deforestation since 1990, measured as verifiable changes in stocks in each commitment period shall be used to meet the commitments in this Article of each Party included in Annex I. The greenhouse gas emissions from sources and removals by sinks associated with those activities shall be reported in a transparent and verifiable manner and reviewed in accordance with Articles 7 and 8.

4. Prior to the first session of the Conference of the Parties serving as the meeting of the Parties to this Protocol, each Party included in Annex I shall provide for consideration by the Subsidiary Body for Scientific and Technological Advice data to establish its level of carbon stocks in 1990 and to

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enable an estimate to be made of its changes in carbon stocks in subsequent years. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session or as soon as practicable thereafter, decide upon modalities, rules and guidelines as to how and which additional human-induced activities related to changes in greenhouse gas emissions and removals in the agricultural soil and land-use change and forestry categories, shall be added to, or subtracted from, the assigned amount for Parties included in Annex I, taking into account uncertainties, transparency in reporting, verifiability, the methodological work of the Intergovernmental Panel on Climate Change, the advice provided by the Subsidiary Body for Scientific and Technological Advice in accordance with Article 5 and the decisions of the Conference of the Parties. Such a decision shall apply in the second and subsequent commitment periods.

5. The Parties included in Annex I undergoing the process of transition to a market economy whose base year or period was established pursuant to decision 9/CP.2 of the Conference of the Parties at its second session, shall use that base year or period for the implementation of their commitments under this Article. Any other Party included in Annex I undergoing the process of transition to a market economy which has not yet submitted its first national communication under Article 12 of the Convention may also notify the Conference of the Parties serving as the meeting of the Parties to this Protocol that it intends to use a historical base year or period other than 1990 for the implementation of its commitments under this Article. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall decide on the acceptance of such notification.

6. Taking into account Article 4, paragraph 6, of the Convention, in the implementation of their commitments under this Protocol other than those in this Article, a certain degree of flexibility shall be allowed by the Conference of the Parties serving as the meeting of the Parties to this Protocol to the Parties included in Annex I undergoing the process of transition to a market economy.

7. In the first quantified emission limitation and reduction commitment period, from 2008 to 2012, the assigned amount for each Party included in Annex I shall be equal to the percentage inscribed for it in Annex B of its aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A in 1990, or the base year or period determined in accordance with paragraph 5 above, multiplied by five.

8. Any Party included in Annex I may use 1995 as its base year for hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride, for the purposes of the calculation referred to in paragraph 7 above.

9. Commitments for subsequent periods for Parties included in Annex I shall be established in amendments to Annex B to this Protocol, which shall be adopted in accordance with the provisions of Article 21. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall initiate the consideration of such commitments at least seven years before the end of the first commitment period mentioned in paragraph 7 above.

10. For the purpose of meeting its commitments under this Article, any Party included in Annex I may participate in emissions trading. The Conference of the Parties shall define the relevant rules and guidelines for verification, reporting and accountability. Such trading shall be supplemental to domestic actions for

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Trading

the purpose of meeting its commitments.

11. Any part of an assigned amount, or any emission reduction units, which a Party acquires from another Party in accordance with the provisions of paragraph 10 above or Article 6 shall be added to the assigned amount for that Party.

12. Any part of an assigned amount, or any emission reduction units, which a Party transfers to another Party in accordance with the provisions of paragraph 10 above or Article 6 shall be subtracted from the assigned amount for that Party.

13. Any certified emission reductions which a Party acquires from another Party in accordance with the provisions of Article 13 shall be added to the assigned amount for that Party.

14. If the emissions of a Party included in Annex I during a commitment period are less than its assigned amount under this Article, this difference shall, on request of that Party, be added to the assigned amount for that Party for subsequent commitment periods.

15. Each Party included in Annex I shall strive to implement the commitments mentioned in paragraph 1 above in such a way as to minimize adverse social, environment and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. In line with relevant decisions of the Conference of the Parties on the implementation of those paragraphs, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, consider what actions are necessary to minimize the adverse effects of climate change and/or the impacts of response measures on Parties referred to in those paragraphs. Among the issues to be considered shall be the establishment of funding, insurance and transfer of technology.

Article 4

1. Any Parties included in Annex I that have agreed to jointly fulfil their commitments under Article 3 shall be deemed to have met those commitments provided that their total combined aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of Article 3. The respective emission level allocated to each of the Parties to the agreement shall be set out in that agreement.

2. The Parties to any such agreement shall notify the secretariat of the terms of the agreement on the date of deposit of their instruments of ratification, acceptance, approval or accession. The secretariat shall in turn inform the Parties and signatories to the Convention of the terms of the agreement.

3. The agreement shall remain in operation for the duration of the commitment period specified in Article 3, paragraph 7.

4. If Parties acting jointly do so in the framework of, and together with, a regional economic integration organization, any alteration in the composition of the organization after adoption of this Protocol shall not affect existing

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commitments under this Protocol. Any alteration in the composition of the organization shall only apply for the purpose of those commitments under Article 3 that are adopted subsequent to that revision.

5. In the event of failure by the Parties to such an agreement to achieve their total combined level of emission reductions, each Party to such an agreement shall be responsible for its own level of emissions set out in the agreement.

6. If Parties acting jointly do so in the framework of, and together with, a regional economic integration organization which is itself a Party to this Protocol, each member State of that regional economic integration organization individually, and together with the regional economic integration organization acting in accordance with Article 24, shall, in the event of failure to achieve the total combined level of emission reductions, be responsible for its level of emissions as notified in accordance with this Article.

Article 5

1. Each Party included in Annex I shall have in place, no later than one year prior to the start of the first commitment period, a national system for the estimation of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol. Guidelines for such national systems, which shall incorporate the methodologies specified in paragraph 2 below, shall be decided upon by the Conference of the Parties serving as the meeting of the Parties to this Protocol at its first session.

2. Methodologies for estimating anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol shall be those accepted by the Intergovernmental Panel on Climate Change and agreed upon by the Conference of the Parties at its third session. Where such methodologies are not used, appropriate adjustments shall be applied according to methodologies agreed upon by the Conference of the Parties serving as the meeting of the Parties to this Protocol at its first session. Based on the work of, inter alia, the Intergovernmental Panel on Climate Change and advice provided by the Subsidiary Body for Scientific and Technological Advice, the Conference of the Parties serving as the meeting of the parties to this Protocol shall regularly review and, as appropriate, revise such methodologies and adjustments, taking fully into account any relevant decisions by the Conference of the Parties. Any revision to methodologies or adjustments shall be used only for the purposes of ascertaining compliance with commitments under Article 3 in respect of any commitment period adopted subsequent to that revision.

3. The global warming potentials used to calculate the carbon dioxide equivalence of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol listed in Annex A shall be those accepted by the Intergovernmental Panel on Climate Change and agreed upon by the Conference of the Parties at its third session. Based on the work of, inter alia, the Intergovernmental Panel on Climate Change and advice provided by the Subsidiary Body for Scientific and Technological Advice, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall regularly review and, as appropriate, revise the global warming potential of each greenhouse gas, taking fully into account any relevant decisions by the Conference of the Parties. Any revision to a global warming potential shall apply only to those commitments under Article 3 in respect of

any commitment period adopted subsequent to that revision.

Article 6

1. For the purpose of meeting its commitments under Article 3, any Party included in Annex I may transfer to, or acquire from, any other such Party emission reduction units resulting from projects aimed at reducing anthropogenic emissions by so or enhancing anthropogenic removals by sinks of greenhouse gases in any sector of the economy, provided that:

- (a) Any such project has the approval of the Parties involved;
- (b) Any such project provides a reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to any that would otherwise occur;
- (c) It does not acquire any emission reduction units if it is not in compliance with its obligations under Articles 5 and 7; and
- (d) The acquisition of omission reduction units shall be supplemental to domestic actions for the purposes of meeting commitments under Article 3.

2. The Conference of the Parties serving as the meeting of the Parties to this Protocol may, at its first session or as soon as practicable thereafter, further elaborate guidelines for the implementation of this Article for verification and reporting.

3. A Party included in Annex I may authorize legal entities to participate, under its responsibility, in actions leading to the generation, transfer or acquisition of this Article of emission reduction units.

4. If a question of implementation by a Party included in Annex I of the requirements referred to in this paragraph is identified in accordance with the relevant provisions of Article 8, transfers and acquisitions of emission reduction units may continue to be made after the question has been identified, provided that any such units may not be used by a Party to meet its commitments under Article 3 until any issue of compliance is resolved.

Article 7

1. Each Party included in Annex I shall incorporate in its annual inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol, submitted in accordance with the relevant decisions of the Conference of the Parties, the necessary supplementary information for the purposes of ensuring compliance with Article 3, to be determined in accordance with paragraph 4 below.

2. Each Party included in Annex I shall incorporate in its national communication, submitted under Article 12 of the Convention, the supplementary information necessary to demonstrate compliance with its commitments under this Protocol, to be determined in accordance with paragraph 4 below.

3. Each Party included in Annex I shall submit the information required under paragraph 1 above annually, beginning with the first inventory due under the

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ANNEX I?

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Additionality

Convention for the first year of the commitment period after this Protocol has entered into force for it. Each such Party shall submit the information required under paragraph 2 above as part of the first national communication due under the Convention after this Protocol has entered into force for it and after the adoption of guidelines as provided for in paragraph 4 below. The frequency of subsequent submission of information required under this Article shall be determined by the Conference of the Parties serving as the meeting of the Parties to this Protocol, taking into account any timetable for the submission of national communications decided upon by the Conference of the Parties.

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall adopt at its first session, and review periodically thereafter, guidelines for the preparation of the information required under this Article, taking into account guidelines for the preparation of national communications by Parties included in Annex I adopted by the Conference of the Parties. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall also, prior to the first commitment period, decide upon modalities for the accounting of assigned amounts.

Article 8

1. The information submitted under Article 7 by each Party included in Annex I shall be reviewed by expert review teams pursuant to the relevant decisions of the Conference of the Parties serving as the meeting of the Parties to this Protocol under paragraph 4 below. The information submitted under Article 7, paragraph 1, by each Party included in Annex I shall be reviewed as part of the annual compilation and accounting of emissions inventories and assigned amounts. Additionally, the information submitted under Article 7, paragraph 2, by each Party included in Annex I shall be reviewed as part of the review of communications.

2. Expert review teams shall be coordinated by the secretariat and shall be composed of experts selected from those nominated by Parties to the Convention and, as appropriate, by intergovernmental organizations, in accordance with guidance provided for this purpose by the Conference of the Parties.

3. The review process shall provide a thorough and comprehensive technical assessment of all aspects of the implementation by a Party of this protocol. The expert review teams shall prepare a report to the Conference of the Parties serving as the meeting of the Parties to this Protocol, assessing the implementation of the commitments of the Party and identifying any potential problems in, and factors influencing, the fulfilment of commitments. Such reports shall be circulated by the secretariat to all Parties to the Convention. The secretariat shall list those questions of implementation indicated in such reports for further consideration by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall adopt at its first session, and review periodically thereafter, guidelines for the review of implementation by expert review teams taking into account the relevant decisions of the Conference of the Parties.

5. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, with the assistance of the Subsidiary Body for Implementation

and, as appropriate, the Subsidiary Body for Scientific and Technological Advice, consider:

(a) The information submitted by the Parties under Article 7 and the reports of the expert reviews thereon conducted under this Article; and

(b) Those questions of implementation listed by the secretariat under paragraph 3 above, as well as any questions raised by Parties.

6. Pursuant to its consideration of the information referred to in paragraph 5 above, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall take decisions on any matter required for the implementation of this Protocol.

Article 9

1. Any signatory or Party to this Protocol not included in Annex I may, at any time, notify the Depository that it has opted to be bound by this Article. The Depository shall inform the other signatories and Parties of any such notification.

2. Such notification, supported by an inventory of emissions of greenhouse gases not controlled by the Montreal Protocol, including for the historical base year or period chosen under subparagraph (a) below, and a projection of future emissions, shall include a formal declaration on the following points:

(a) Its chosen historical base year or period for the implementation of subparagraph (b) below; and

(b) The level of limitation or reduction of anthropogenic emissions of greenhouse gases listed in Annex A, as a basket, it is ready to undertake.

3. Where a notification has been made pursuant to paragraphs 1 and 2 above, the secretariat shall include it in the agenda for the following session of the Conference of the Parties serving as the meeting of the Parties to this Protocol which shall decide on the acceptance of such notification.

4. After its acceptance by the Conference of the Parties serving as the meeting of the Parties to this Protocol, a notification by a signatory shall enter into force on the date of entry into force of this Protocol for that State, and a notification by a Party to this Protocol shall enter into force on the ninetieth day after the acceptance of such notification. The commitment under paragraph 2(b) above of Parties acting under this Article shall be inscribed in Annex B.

Article 10

1. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall periodically review this Protocol in the light of the best available scientific information and assessments on climate change and its impacts, as well as relevant technical, social and economic information. Such reviews shall be coordinated with pertinent reviews under the Convention, in particular those required by Article 4, paragraph 2(d), and Article 7, paragraph 2(a), of the Convention. Based on these reviews, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall take appropriate action.

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Reviews

2. The first review shall take place at the second session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. Further reviews shall take place at regular intervals and in a timely manner.

Article 11

All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, without introducing any new commitments for Parties not included in Annex I, but reaffirming existing commitments in Article 4, paragraph 1, of the Convention, and continuing to advance the implementation of these commitments in order to achieve sustainable development, taking into account Article 4, paragraphs 3, 5 and 7, of the Convention, shall:

(a) Formulate, where relevant and to the extent possible, cost-effective national, and where appropriate regional programmes to improve the quality of local emission factors, activity data and/or models which reflect the socio-economic conditions of each Party for the preparation and periodic updating of national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties, and consistent with the guidelines for national communications adopted by the Conference of the Parties;

Alternative A

(b) Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change and measures to facilitate adequate adaptation to climate change;

(i) The programmes containing measures shall, inter alia, and to the extent possible and relevant, remove obstacles to the limitation or the abatement of increase of anthropogenic emissions by sources and to the enhancement of removals by sinks, enhance energy efficiency, emphasize market-oriented pricing, as appropriate encourage reforms in the energy sector and regulatory regimes, increase the use of renewable energy, make improvements in the transport and industrial sectors, promote the development and sustainable management of greenhouse gas sinks and reservoirs, improve the integration of climate change considerations into the agriculture and waste management sectors, promote voluntary arrangements with industry, and generally take actions to address climate change that, in the context of their national priorities, objectives and circumstances, are economically justified and can help address other environmental problems; and

(ii) The programmes containing measures shall, inter alia, and to the extent possible and relevant, deploy adaptation technologies and know-how, develop and implement integrated mountain area plans, develop and implement integrated coastal zone management plans, develop research on impacts of, and adaptation to, climate change, develop and implement related technical capacity building and awareness raising measures promote sustainable management plans for the conservation and enhancement of sinks and reservoirs and ecosystems and develop and implement plans for water resources and agriculture, particularly for countries affected by drought and desertification;

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Alternative B

(b) Each developed country Party and each other developed Party included in Annex II to the Convention shall incorporate into its national programmes the quantified emission limitation and reduction objectives and related policies and measures under this Protocol, including details of measures undertaken by them to promote, facilitate and finance transfer of technology, provide new and additional financial resources and assist in meeting costs of adaptation in developing countries. Each developing country Party shall seek to include in its national communication, as appropriate, information on programmes which contain measures that the Party believes contribute to addressing climate change and its adverse impacts, including the abatement of increase in greenhouse gas emissions, and enhancement of and removals by sinks, capacity building and adaptation measures;

(c) Cooperate in the promotion of effective modalities for the development, application and diffusion of, and take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies, know-how, practices and processes pertinent to climate change, in particular to developing countries, including the formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain and the creation of an enabling environment for the private sector, to promote and enhance access to, and transfer of, environmentally sound technologies;

(d) Cooperate in scientific and technical research and promote the maintenance and the development of systematic observation systems and development of data archives to reduce uncertainties related to the climate system, the adverse impacts of climate change and the economic and social consequences of various response strategies, and promote the development and strengthening of endogenous capacities and capabilities to participate in international and intergovernmental efforts, programmes and networks on research and systematic observation, taking into account Article 5 of the Convention;

(e) Cooperate in and promote at the international level, and, where appropriate, using existing bodies, the development and implementation of education and training programmes, including the strengthening of national capacity building, in particular human and institutional capacities and the exchange or secondment of personnel to train experts in this field, in particular for developing countries, and facilitate at the national level public awareness and public access to information on climate change. Suitable modalities should be developed to implement these activities through the relevant bodies of the Convention taking into account Article 6 of the Convention;

(f) Include in their national communications information on programmes and activities undertaken pursuant to this Article in accordance with relevant decisions of the Conference of the Parties; and

(g) Give full consideration, in implementing the commitments in this Article, to Article 4, paragraph 8, of the Convention.

Article 12

1. In the implementation of Article 11, Parties shall take into account the

provisions of Article 4, paragraphs 4, 5, 7, 8 and 9 of the Convention.

2. In the context of the implementation of Article 4, paragraph 1, of the Convention, in accordance with the provisions of Article 4, paragraph 3, and Article 11 of the Convention, and through the operating entity or entities of the financial mechanism of the Convention, the developed country Parties and other developed Parties included in Annex II to the Convention shall:

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(a) Provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in advancing the implementation of existing commitments under Article 4, paragraph 1(a), of the Convention that are covered in Article 11, subparagraph (a); and

(b) Also provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of advancing the implementation of existing commitments in Article 4, paragraph 1, of the Convention that are covered by Article 11 and that are agreed between a developing country Party and the international entity or entities referred to in Article 11 of the Convention, in accordance with that Article.

The implementation of these existing commitments shall take into account the need for adequacy and predictability in the flow of funds and the importance of appropriate burden sharing among developed country Parties. The guidance to the financial mechanism of the Convention in relevant decisions of the Conference of the Parties, including those agreed before the adoption of this Protocol, shall apply mutatis mutandis to the provisions of this paragraph.

3. The developed country Parties and other developed Parties in Annex II to the Convention may also provide, and developing country Parties avail themselves of, financial resources for the implementation of Article 11, through bilateral, regional and other multilateral channels.

Article 13

1. A clean development mechanism is hereby defined.

2. The purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3.

3. Under the clean development mechanism:

(a) Parties not included in Annex I will benefit from project activities resulting in certified emission reductions; and

(b) Parties included in Annex I may use the certified emission reductions accruing from such project activities to contribute to compliance with part of their quantified emission limitation and reduction commitments under Article 3, as determined by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

4. The clean development mechanism shall be subject to the authority and

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guidance of the Conference of the Parties serving as the meeting of the Parties to this Protocol and be supervised by an executive board of the Parties.

5. Emission reductions resulting from each project activity shall be certified by operational entities to be designated by the Conference of the Parties serving as the meeting of the Parties to this Protocol, on the basis of:

(a) Voluntary participation approved by each Party involved;

(b) Real, measurable, and long-term benefits related to the mitigation of climate change; and

(c) Reductions in emissions that are additional to any that would occur in the absence of the certified project activity.

6. The clean development mechanism shall assist in arranging funding of certified project activities as necessary.

7. The Conference of Parties serving as the meeting of the Parties to this Protocol shall, at its first session, elaborate modalities and procedures with the objective of ensuring transparency, efficiency and accountability through independent auditing and verification of project activities.

8. A share of the proceeds from certified project activities shall be used to cover administrative expenses as well as assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation.

9. Participation under the clean development mechanism, including in activities mentioned in paragraph 3(a) above and acquisition of certified emission reductions, may involve private and/or public entities, and is to be subject to whatever guidance may be provided by the executive board of the clean development mechanism.

10. Certified emission reductions obtained during the period from the year 2000 up to the beginning of the first commitment period can be used to assist in achieving compliance in the first commitment period.

Article 14

1. The Conference of the Parties, the supreme body of the Convention, shall Serve as the meeting of the Parties to this Protocol.

2. Parties to the Convention that are not Parties to this Protocol may participate as observers in the proceedings of any session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. When the Conference of the Parties serves as the meeting of the Parties to this Protocol, decisions under this Protocol shall be taken only by those that are Parties to it.

3. When the Conference of the Parties serves as the meeting of the Parties to this Protocol, any member of the Bureau of the Conference of the Parties representing a Party to the Convention but, at that time, not a Party to this Protocol, shall be substituted by an additional member to be elected by and from amongst the Parties to this Protocol.

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall keep under regular review the implementation of this Protocol and shall make, within its mandate, the decisions necessary to promote its effective implementation. It shall perform the functions assigned to it by this Protocol and shall:

(a) Assess, on the basis of all information made available to it in accordance with the provisions of this Protocol, the implementation of this Protocol by the Parties, the overall effects of the measures taken pursuant to this Protocol, in particular environmental, economic and social effects as well as their cumulative impacts and the extent to which progress towards the objective of the Convention is being achieved;

(b) Periodically examine the obligations of the Parties under this Protocol, giving due consideration to any reviews required by Article 4, paragraph 2(d), and Article 7, paragraph 2, of the Convention, in the light of the objective of the Convention, the experience gained in its implementation and the evolution of scientific and technological knowledge, and in this respect consider and adopt regular reports on the implementation of this Protocol;

(c) Promote and facilitate the exchange of information on measures adopted by the Parties to address climate change and its effects, taking into account the differing circumstances, responsibilities and capabilities of the Parties and their respective commitments under this Protocol;

(d) Facilitate, at the request of two or more Parties, the coordination of measures adopted by them to address climate change and its effects, taking into account the differing circumstances, responsibilities and capabilities of the Parties and their respective commitments under this Protocol;

(e) Promote and guide, in accordance with the objective of the Convention and the provisions of this Protocol, and taking fully into account the relevant decisions by the Conference of the Parties, the development and periodic refinement of comparable methodologies for the effective implementation of this Protocol, to be agreed on by the Conference of the Parties serving as the meeting of the Parties to this Protocol;

(f) Make recommendations on any matters necessary for the implementation of this Protocol;

(g) Seek to mobilize additional financial resources in accordance with Article 12, paragraph 2;

(h) Establish such subsidiary bodies as are deemed necessary for the implementation of this Protocol;

(i) Seek and utilize, where appropriate, the services and cooperation of, and information provided by, competent international organizations and intergovernmental and non-governmental bodies; and

(j) Exercise such other functions as may be required for the implementation of this Protocol, and consider any assignment resulting from a decision by the Conference of the Parties.

5. The rules of procedure of the Conference of the Parties and financial

procedures of the Convention shall be applied *mutatis mutandis* under this Protocol, except as may be otherwise decided by consensus by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

6. The first session of the Conference of the Parties serving as the meeting of the Parties to this Protocol shall be convened by the secretariat in conjunction with the first session of the Conference of the Parties that is scheduled after the date of the entry into force of this Protocol. Subsequent ordinary sessions of the Conference of the Parties serving as the meeting of the Parties to this Protocol shall be held every year and in conjunction with ordinary sessions of the Conference of the Parties unless otherwise decided by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

7. Extraordinary sessions of the Conference of the Parties serving as the meeting of the Parties to this Protocol shall be held at such other times as may be deemed necessary by the Conference of the Parties serving as the meeting of the Parties to this Protocol, or at the written request of any Party, provided that, within six months of the request being communicated to the Parties by the secretariat, it is supported by at least one third of the Parties.

8. The United Nations, its specialized agencies and the International Atomic Energy Agency, as well as any State member thereof of observers thereto not party to the Convention, may be represented at sessions of the Conference of the Parties serving as the meeting of the Parties to this Protocol as observers. Any body or agency, whether national or international, governmental or non-governmental, which is qualified in matters covered by this Protocol and which has informed the secretariat of its wish to be represented at a session of the Conference of the Parties serving as the meeting of the Parties to this Protocol as an observer, may be so admitted unless at least one third of the Parties present object. The admission and participation of observers shall be subject to the rules of procedure, as referred to in paragraph 5 above.

Article 15

1. The secretariat established by Article 8 of the Convention shall serve as the secretariat of this Protocol.

2. Article 8, paragraph 2, of the Convention on the functions of the secretariat, and Article 8, paragraph 3, of the Convention on arrangements made for the functioning of the secretariat, shall apply *mutatis mutandis* to this Protocol. The secretariat shall, in addition, exercise the functions assigned to it under this Protocol.

Article 16

1. The Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation established by Articles 9 and 10 of the Convention shall serve as, respectively, the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation of this Protocol. The provisions relating to the functioning of these two bodies under the Convention shall apply *mutatis mutandis* to this Protocol. Sessions of the meetings of the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation of this Protocol shall be held in conjunction with the meetings of, respectively, the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for

Implementation of this Convention.

2. Parties to the Convention that are not Parties to this Protocol may participate as observers in the proceedings of any session of the subsidiary bodies. When the subsidiary bodies serve as the subsidiary bodies of this Protocol, decisions under this Protocol shall be taken only by the Parties to this Protocol.

3. When the subsidiary bodies established by Articles 9 and 10 of the Convention exercise their functions with regard to matters concerning this Protocol, any member of the Bureaux of those subsidiary bodies representing a Party to the Convention but, at that time, not a party to this Protocol, shall be substituted by an additional member to be elected by and from amongst the Parties to this Protocol.

Article 17

The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, as soon as practicable, consider the application to this Protocol of, and modify as appropriate, the multilateral consultative process referred to in Article 13 of the Convention, in the light of any relevant decisions that may be taken by the Conference of the Parties. Any multilateral consultative process that may be applied to this Protocol shall operate without prejudice to the procedures and mechanisms established in accordance with Article 18.

Article 18

The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, approve appropriate and effective procedures and mechanisms to determine and to address cases of non-compliance with the provisions of this Protocol, including through the development of an indicative list of consequences, taking into account the cause, type, degree and frequency of non-compliance. Any procedures and mechanisms under this Article entailing binding consequences shall be adopted by means of an amendment to this Protocol.

Article 19

The provision of Article 14 of the Convention on settlement of disputes shall apply *mutatis mutandis* to this Protocol.

Article 20

1. Any party may propose amendments to this Protocol.
2. Amendments to this Protocol shall be adopted at an ordinary session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. The text of any proposed amendment to this Protocol shall be communicated to the Parties by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate the text of any proposed amendments to the Parties and signatories to the Convention and, for information, to the Depositary.
3. The Parties shall make every effort to reach agreement on any proposed amendment to this Protocol by consensus. If all efforts at consensus have

been exhausted, and no agreement reached, the amendment shall as a last resort be adopted by a three-fourths majority vote of the Parties present and voting at the meeting. The adopted amendment shall be communicated by the secretariat to the Depositary, who shall circulate it to all Parties for their acceptance.

4. Instruments of acceptance in respect of an amendment shall be deposited with the Depositary. An amendment adopted in accordance with paragraph 3 above shall enter into force for those Parties having accepted it on the ninetieth day after the date of receipt by the Depositary of an instrument of acceptance by at least three fourths of the Parties to this Protocol.

5. The amendment shall enter into force for any other Party on the ninetieth day after the date on which that Party deposits with the Depositary its instrument of acceptance of the said amendment.

Article 21

1. Annexes to this Protocol shall form an integral part thereof and, unless otherwise expressly provided, a reference to this Protocol constitutes at the same time a reference to any annexes thereto. Any annexes adopted after the entry into force of this Protocol shall be restricted to lists, forms and any other material of a descriptive nature that is of a scientific, technical, procedural or administrative character.

2. Any Party may make proposals for an annex to this Protocol and may propose amendments to annexes to this Protocol.

3. Annexes to this Protocol and amendments to annexes to this Protocol shall be adopted at an ordinary session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. The text of any proposed annex or amendment to an annex shall be communicated to the Parties by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate the text of any proposed annex or amendment to an annex to the Parties and signatories to the Convention and, for information, to the Depositary.

4. The Parties shall make every effort to reach agreement on any proposed annex or amendment to an annex by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the annex or amendment to an annex shall as a last resort be adopted by a three-fourths majority vote of the Parties present and voting at the meeting. The adopted annex or amendment to an annex shall be communicated by the secretariat to the Depositary, who shall circulate it to all Parties for their acceptance.

5. An annex, other than Annex A or B, that has been adopted or amended in accordance with paragraphs 3 and 4 above shall enter into force for all Parties to this Protocol six months after the date of the communication by the Depositary to such Parties of the adoption or amendment of the annex, except for those Parties that have notified the Depositary in writing within that period of their non-acceptance of the annex or amendment to the annex. The annex or amendment to an annex shall enter into force for Parties which withdraw their notification of non-acceptance on the ninetieth day after the date on which withdrawal of such notification has been received by the Depositary.

6. If the adoption of an annex or an amendment to an annex involves an amendment to this Protocol, that annex or amendment to an annex shall not enter into force until such time as the amendment to this Protocol enters into force.

7. Amendments to Annexes A and B to this Protocol shall be adopted and enter into force in accordance with the procedure set out in Article 20, provided that any amendments to Annex B shall be adopted only with the written consent of the Party concerned.

Article 22

1. Each Party shall have one vote, except as provided for in Paragraph 2 below.
2. Regional economic integration organizations, in matters within their competence, shall exercise their right to vote with a number of votes equal to the number of their member States which are Parties to this Protocol. Such an organization shall not exercise its right to vote if any of its member States exercises its right, and vice versa.

Article 23

The Secretary-General of the United Nations shall be the Depositary of this Protocol.

Article 24

1. This Protocol shall be open for signature and subject to ratification, acceptance or approval by States and regional economic integration organizations which are Parties to the Convention. It shall be open for signature at United Nations Headquarters in New York from 16 March 1998 to 15 March 1999. This Protocol shall be open for accession from the day after the date on which it is closed for signature. Instruments of ratification, acceptance, approval or accession shall be deposited with the Depositary.
2. Any regional economic integration organization which becomes a Party to this Protocol without any of its member States being a Party shall be bound by all the obligations under this Protocol. In the case of such organizations, one or more of whose member States is a Party to this Protocol, the organization and its member States shall decide on their respective responsibilities for the performance of their obligations under this Protocol. In such cases, the organization and the member States shall not be entitled to exercise rights under this Protocol concurrently.
3. In their instruments of ratification, acceptance, approval or accession, regional economic integration organizations shall declare the extent of their competence with respect to the matters governed by this Protocol. These organizations shall also inform the Depositary, who shall in turn inform the Parties, of any substantial modification in the extent of their competence.

Article 25

1. this Protocol shall enter into force on the ninetieth day after the date on which not less than 55 Parties to the Convention, incorporating Parties included in Annex I which accounted in total for at least 55 per cent of the total

Entry
into
force

carbon dioxide emissions for 1990 of the Parties included in Annex I, have deposited their instruments of ratification, acceptance, approval or accession.

2. For the purposes of this Article, "the total carbon dioxide emissions for 1990 of the Parties included in Annex I" means the amount communicated on or before the date of adoption of this Protocol by the Parties included in Annex I in their first national communications submitted in accordance with Article 12 of the Convention.

3. For each State or regional economic integration organization that ratifies, accepts or approves this Protocol or accedes thereto after the conditions set out in paragraph 1 above for the entry into force have been fulfilled, this Protocol shall enter into force on the ninetieth day following the date of deposit of its instrument of ratification, acceptance, approval or accession.

4. For the purposes of this Article, any instrument deposited by a regional economic integration organization shall not be counted as additional to those deposited by States members of the organization.

Article 26

No reservations may be made to this Protocol.

Article 27

1. At any time after three years from the date on which this Protocol has entered into force for a Party, that Party may withdraw from this Protocol by giving written notification to the Depositary.

2. Any such withdrawal shall take effect upon expiry of one year from the date of receipt by the Depositary of the notification of withdrawal, or on such later date as may be specified in the notification of withdrawal.

3. Any Party that withdraws from the Convention shall be considered as also having withdrawn from this Protocol.

Article 28

The original of this Protocol, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations.

Done at Kyoto this tenth day of December one thousand nine hundred and ninety-seven.

Annex A

Greenhouse gases

Carbon dioxide (CO₂)

Methane (CH₄)

Nitrous oxide (N₂O)

Hydrofluorocarbons (HFCs)

Perfluorocarbons (PFCs)

Sulphur hexafluoride (SF6)

Sectors/source categories

Energy

Fuel combustion

Energy industries

Manufacturing industries and construction

Transport

Other sectors

Other

Fugitive emissions from fuels

Solid fuels

Oil and natural gas

Other

Industrial processes

Mineral products

Chemical industry

Metal production

Other production

Production of halocarbons and sulphur hexafluoride

Consumption of halocarbons and sulphur hexafluoride

Other

Solvent and other product use

Agriculture

Enteric fermentation

Manure management

Rice cultivation

Agricultural soils

Prescribed burning of savannas

Field burning of agricultural residues

Other

Waste

Solid waste disposal on land

Wastewater handling

Waste incineration

Other

Annex B

Party Quantified emission
limitation or reduction
commitments (percentage change
from 1990)

Australia

(to be completed)

Austria

Belgium

Bulgaria*

Canada

Croatia*

Czech Republic*

Denmark

Estonia*

European Community

Finland

France

Germany

Greece

Hungary*

Iceland

Ireland

Italy

Japan

Latvia*

Liechtenstein

Lithuania*

Luxembourg

Monaco

Netherlands

New Zealand

Norway

Poland*

Portugal

Romania*

Russian Federation*

Slovakia*

Slovenia*

Spain

Sweden

Switzerland

Ukraine*

United Kingdom of Great Britain and

Northern Ireland

United States of America

*Countries that are undergoing the process of transition to a market economy.

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Kyoto Protocol:
Article-by-Article Review

DRAFT

Preamble

- o The preamble is self-explanatory, containing nothing of particular interpretive significance.

Article 1 (Definitions)

- o The definitions are technical and not of policy significance.

Article 2 (Policies/Measures)

- o This Article obligates Annex I Parties, in achieving their target commitments, to implement policies and measures in accordance with their national circumstances.
- o The list of policies and measures in this Article (e.g., "enhancement of energy efficiency in relevant sectors of the national economy") is illustrative, not mandatory.
- o In order to avoid inconsistent national approaches in two areas where international coordination is desirable, the Article obligates Annex I Parties to pursue limitation or reduction of emissions from aviation and marine bunker fuels, working through the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO). (It should be noted that, through a separate methodological decision, it is made clear that bunker fuels do not count against national emissions totals.)
- o In lieu of the G-77's unacceptable call for a compensation fund, the Article calls upon Annex I Parties, collectively rather than individually, to "strive" to implement policies and measures in such a way as to "minimize" adverse effects (both environmental and economic) on other Parties, including developing country Parties. The Conference of the Parties serving as the meeting of the Parties (hereinafter "COP/MOP") make take further action to implement this paragraph.

-- It should be noted that a similar provision appears in Article 3.14, discussed below.

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- It should be noted that COP 3 Decision L.9 requests the Subsidiary Body for Implementation, at its 8th session, to determine actions necessary to implement the corresponding provision in the Framework Convention (i.e., Article 4(8) and (9) relating to the specific needs of developing country Parties particularly affected by either climate change or by response measures to climate change) and further requests COP 4 to take a decision on actions.
- o Finally, the Article provides for the COP/MOP, if it decides it would be beneficial to coordinate any policies and measures (i.e., on a strictly voluntary basis), then it is to consider ways to elaborate such coordination.

Article 3 (Annex I Target)

- o Paragraph 1 contains two important features:
 - First, it sets forth the obligation of Annex I Parties to ensure that their emissions do not exceed their commitments, as set forth in Annex B (which contains the relevant percentage for each Party) and the rest of Article 3 (which contains time periods, base years, accounting rules, etc.). In order to make clear that the obligation, even though written in the plural ("The Parties included in Annex I shall..."), is not a collective obligation under which each Party would be responsible for another, the phrase "individually or jointly" was included.
 - Second, the end of the sentence containing the obligation states "with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012." There are three reasons why this phrase was written in non-legally binding terms:
 - o The point of the statement is more political than legal, i.e., it was considered that it more make it more palatable to have certain Annex I Parties increasing their emissions over 1990 levels (such as Australia) if it were pointed out that, as a group, the Annex I Parties will actually be reducing below 1990 levels.
 - o The figure of 5% below 1990 levels does not take account of the ability of Annex I Parties to increase their allowed emissions through the Clean Development Mechanism, described below. In other words, emissions trading and joint implementation among Annex I Parties would not change the 5% figure; however, additional emissions allowances through the CDM from outside of Annex I could theoretically even put the Annex I Parties over 1990 levels.

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- o If legally binding, the provision might imply a collective responsibility to meet the group target, which would not have been acceptable to us.
- o It should also be noted, with respect to paragraph 1, that there has been a lack of clarity under the Convention as to which emissions count against a Party. In part to address this issue, and in part to address the U.S. national security issue, COP 3 adopted Decision L.5, which provides, inter alia:
 - that emissions based upon fuel sold to ships or aircraft engaged in international transport are not included in national totals; and
 - that emissions resulting from multilateral operations pursuant to the UN Charter are not included in national totals; and
 - that other emissions related to the operations noted above (such as from training in a foreign country) are to be included in the national totals of one or more of the Parties involved, but it leaves to those Parties to figure out which. (In this way, it allows Parties to reallocate emissions without going through emissions trading.)
- o Paragraph 2, in order to respond to calls for an obligation before the 2008-2012 commitment period, calls for each Annex I Party to have made "demonstrable progress" in achieving its commitments. The U.S. took the position that, for example, having in place the necessary implementing legislation would fulfill this obligation.
- o Paragraph 3 relates to sinks, specifically their treatment during the commitment period. (One must look to paragraph 7 of this Article to see that sinks are not included in the baseline.) The significant features include:
 - that net changes in the specified categories are to be used in meeting the target commitment; in other words, a Party does not get to count only the positive.
 - that the net changes in the specified categories must be counted; in other words, counting sinks is not optional.
 - that the categories are currently limited to afforestation, reforestation, and deforestation, and, further, that these activities only count since 1990; in other words, the net changes in emissions from trees planted before 1990 would not count.

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- o Paragraph 4 contains two elements:
 - First, each Annex I Party is to provide data to SBSTA to establish its level of carbon stocks in 1990.
 - Second, the COP/MOP is authorized to decide upon the rules for how sink activities are to be counted, as well as for which additional activities are to be counted. (In order to avoid a situation where the addition of a new activity would make it more difficult for a Party to reach its target, any additions apply automatically only to subsequent commitment periods; a Party may, however, take advantage of an additional activity by opting to count it for purposes of the first commitment period.)
 - o (Pursuant to COP 3 Decision L.7, this issue is on the agenda for COP 4.)
- o Paragraphs 5 and 6 deal with countries with economies in transition. They provide:
 - that the countries whose base years were decided under the Convention (e.g., 1987 for Russia) are to use those base years;
 - other countries with economies in transition may use a base year other than 1990, provided the COP/MOP approves such base year; and
 - the COP/MOP is to provide countries with economies in transition "a certain degree of flexibility" in the implementation of obligations under the Protocol other than under Article 3, i.e., such countries may not be accorded flexibility with respect to any other aspect of the target obligation other than the base year.
- o Paragraph 7 defines the initial "assigned amount" for the first commitment period of 2008-2012, i.e., the amount that may be emitted during that period.
 - It is derived from taking a Party's emissions of the six gases listed in Annex A in 1990 (except that economies in transition may be using a different base year and that Parties may elect 1995 for three of the gases, see below), multiplying that number by the percentage inscribed in Annex B (i.e., 93% for the United States), and multiplying that total by 5 (the number of years in the commitment period).

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- To accommodate Australia, this paragraph also provides that Parties for whom land use change and forestry constituted a net source of emissions in 1990 are to include the net change amount in their assigned amount.
- o Paragraph 8 allows a Party to elect to use 1995 as its base year for HFCs, PFCs, and SF6.
- o Paragraph 9 provides that commitments for subsequent commitment periods are to be established through amendment of Annex B. The amendment procedure that would apply would require affirmative ratification, approval, etc., *i.e.*, the quicker opt-out procedure that might otherwise apply to annex amendments would not apply.
- o Paragraphs 10, 11, 12 are accounting paragraphs. They provide for assigned amounts to be increased or decreased based on amounts received or transferred under emissions trading, joint implementation, or the Clean Development Mechanism.
- o Paragraph 13 incorporates the U.S. "banking" proposal, namely it allows a Party that emits less than its assigned amount during a commitment period to add that amount to a subsequent commitment period's assigned amount.
- o As noted above, paragraph 4 is similar to paragraph 3 of Article 2, except that:
 - it applies to each Annex I Party, rather to Annex I Parties collectively; and
 - it specifically notes that the COP/MOP is to consider the establishment of funding, insurance, and transfer of technology.

Article 4 ("Bubble")

- o This Article allows Annex I Parties to prospectively reallocate their emissions targets, provided their total emissions do not exceed their combined assigned amounts.
 - If the Parties failed to achieve the total level of emissions reductions, each Party would be responsible for its own level of emissions set out in the reallocation agreement.
- o Any reallocation agreement must be notified upon ratification and remains in operation for the commitment period in question. In other words, it may not be changed for that commitment period.

- o If a regional economic integration organization (such as the EU) is involved, any change in the composition of the organization after adoption does not affect existing commitments. In other words, if an Eastern European country were to join the EU next week, it could not join the EU bubble; that country would only be part of the bubble for purposes of subsequent commitments.

Article 5 (Measurement)

- o Under this Article, each Annex I Party must have in place, no later than 2007, a national system for the estimation of anthropogenic emissions by sources and removals by sinks of greenhouse gases.
- o Guidelines for national measurement systems are to be decided by the COP/MOP and are to incorporate the IPCC methodologies, which were agreed upon at COP 3.
- o Where a Party does not use the accepted methodologies, appropriate adjustments (e.g., discounting) are to be applied according to methodologies agreed by the COP/MOP.
- o The COP/MOP is to regularly review methodologies and revise them as needed; importantly, revisions would only apply prospectively to subsequent commitments.
- o This Article also provides that the global warming potentials (GWPs) used to calculate carbon dioxide equivalence (note that the target commitment is written in terms of carbon dioxide equivalence) are those accepted by the IPCC and agreed by COP 3. As with methodologies, the COP/MOP may revise GWPs; however, any revisions would only apply to subsequent commitments.

Article 6 (JI with Annex I)

- o This Article is largely the joint implementation provision that the U.S. sought, except limited to Annex I Parties.
- o The key elements include:
 - Unlike under emissions trading (see Article 16 bis below) and the Clean Development Mechanism (see Article 12 below), the COP/MOP is not commanded to set rules; rather, it is authorized ("may") to further elaborate guidelines. This implies that JI could go forward without further COP/MOP action. (It should be noted, however, that the elaboration of guidelines is on the COP 4 agenda.)

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- JI applies to emission reduction units resulting not only from mitigation projects, but also from projects "enhancing anthropogenic removals by sinks."
- Projects must have the approval of the Parties involved.
- A project must provide a reduction that is "additional" to any that would otherwise occur.
- A Party cannot acquire units if it is not in compliance with its measurement/reporting obligations; if a compliance issue is raised, units can continue to be exchanged; however, units may not be used to meet the target until any compliance issue is resolved.
- As under emissions trading (see Article 16 bis below), JI is to be "supplemental" to domestic actions for meeting the target.
- Parties may authorize legal entities (which could include the private sector) to participate.

Article 7 (Reporting)

- o Under this Article, each Annex I Party must incorporate in its annual inventory of emissions/removals and its national communication under the Convention the additional information that is necessary to ensure compliance with the target obligation.
- o The COP/MOP is to adopt guidelines for the submission of such additional information.

Article 8 (Review)

- o This Article provides that the information submitted by Annex I Parties under the previous Article is to be reviewed by expert teams, which are to be coordinated by the Secretariat and to be composed of experts selected from those nominated by Parties and, as appropriate, by intergovernmental organizations.
- o Expert teams are to prepare a report to the COP/MOP assessing implementation of all commitments (not just the target), including identifying potential problems in fulfilling commitments.

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- o The COP/MOP is to consider:
 - information submitted under Article 7;
 - the reports prepared by the expert teams; and
 - any questions of implementation raised by the reports, as well as any questions raised by Parties;
- and take decisions.

Article 9 (Review of Protocol)

- o This Article provides for the COP/MOP to review the Protocol periodically, in coordination with relevant reviews under the Convention; the first review is to take place at the second session of the COP/MOP.
- o Significantly, the review under this Article is not (as had been proposed by some) limited to reviewing the commitments of Annex I Parties

Article 10 (Advancing Implementation of Commitments)

- o Pursuant to the Berlin Mandate, this Article advances the implementation of existing commitments under Article 4.1 of the Convention.
- o It applies to all Parties.
- o With various qualifiers, it calls upon Parties to:
 - formulate cost-effective programs to improve the quality of local emission factors;
 - implement programs containing measures to mitigate climate change and facilitate adaptation to climate change;
 - cooperate in promoting effective modalities for development, application, diffusion, and transfer of environmentally sound technologies pertinent to climate change; (significantly, the provision refers to the creation of an "enabling environment for the private sector");
 - cooperate in scientific and technical research and promote systematic observation systems; and
 - cooperate in development and implementation of education and training programs.

Article 11 (Financial Resources)

- o This Article essentially restates the financial provisions of the Convention; it does not create new financial obligations.
- o First, it provides that the operating entity of the financial mechanism of the Convention (i.e., the GEF) shall apply.
- o Second, under the Convention, developed country Parties are obligated to provide new and additional financial resources to meet:
 - the agreed full costs incurred by developing country Parties in meeting certain commitments, such as reporting; and
 - the agreed full incremental costs of meeting "other commitments."

This Article makes clear which provisions of the previous Article (which advances the implementation of existing commitments under the Convention) qualify for full cost funding and which qualify for incremental cost funding.

Article 12 (Clean Development Mechanism)

- o This Article provides for the functional equivalent of joint implementation with developing countries.
- o It provides for Annex I Parties to be able to get credit towards "part" of their target (to be defined by the COP/MOP) for emissions reductions from project activities in non-Annex I countries.
- o Emission reductions are to be certified by operational entities to be designated by the COP/MOP, based on:
 - voluntary participation by each involved Party;
 - real, measurable, and long-term benefits related to mitigation of climate change (which would appear to include sink projects);
 - reductions in emissions that are "additional" to any that would occur in the absence of the activity.
- o The COP/MOP is to ensure that a share of proceeds from certified activities is used to cover administrative expenses, as well as assist developing country Parties (such as small island states) to adapt to climate change.

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- o As in Article 6 on JI, it is clear that the private sector may participate; participation may involve either investing in project activities that yield emission reductions or acquiring certified emission reductions without such an investment.
- o Significantly, the Article provides for early credit in that certified reductions obtained from 2000 up to 2008 can be used to meet the target.
 - COP 3 Decision L.7 calls for COP 4 to analyze the implications of this provision.

Article 13 (COP/MOP)

- o As a compromise between those wanting the Convention's Conference of the Parties (COP) to be the institution for the Protocol and those seeking a new, separate institution, Article 13 provides that the Convention COP will serve as the "meeting of the Parties" to the Protocol. While leaving ambiguous whether the COP/MOP is a new institution, the Article does make clear that decisions under the Protocol may only be taken by those that are Parties to the Protocol.
- o The COP/MOP has basically the same functions with respect to the Protocol that the COP has with respect to the Convention.
- o Significantly, the Article provides that the Convention's rules of procedure and financial rules will apply under the Protocol, except as otherwise decided by consensus by the COP/MOP. The implications of this provision are:
 - that, in the absence of agreed rules of procedure under the Convention (the current situation), the default decision-making rule under the Protocol would be consensus; and
 - the Convention's rules of procedure now need to be approached from the point of view that, absent consensus to the contrary, they will also apply to the Protocol.

Article 14 (Secretariat)

- o This Article provides for the Convention Secretariat to serve as the Protocol Secretariat.

Article 15 (Subsidiary Bodies)

- o This Article provides for the Convention's subsidiary bodies, namely the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation, to serve as the subsidiary bodies under the Protocol.

Article 16 (Multilateral Consultative Process)

- o Article 13 of the Convention provides for the COP to
"consider the establishment of a multilateral consultative process, available to Parties on their request, for the resolution of questions regarding the implementation of the Convention."
- o The intent was to create a forum for implementation questions that, in contrast to traditional dispute-settlement, was: multilateral; friendly; and able to take up issues that were necessarily alleged treaty violations.
- o Numerous, inconclusive discussions have taken place under the Convention concerning the establishment of such a process.
- o This Article of the Protocol presupposes the existence of a process under the Convention. It provides for the COP/MOP to consider the application to the Protocol of such a process, making modifications as appropriate.

Article 16 bis (Emissions Trading)

- o This Article establishes emissions trading for purposes of meeting target commitments.
- o Its significant features include:
 - It provides for the COP (as opposed to the COP/MOP, so that decisions can be made in advance of the Protocol's entry into force) to define the relevant rules for trading. (The rules are on the agenda for COP 4.)
 - There is a free-standing sentence providing for the ability to participate in emissions trading; unlike the penultimate version of the text, it is not explicitly preconditioned on the establishment of rules.

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- In contrast to proposals to put a percentage limit on the amount of the target that Party could satisfy through trading (either through a number or by providing that domestic actions had to be the "main" means of meeting the target), the Article simply provides that trading is to be "supplemental" to domestic actions.
- Unlike other provisions in Article 3, which refer to Parties "included in Annex I," this Article provides for trading among "Parties included in Annex B." This is a result of a technical fix that was made when Article 10 (voluntary opt-in) was still in the text; that Article provided that, if a developing country took on a target, it would be inscribed in Annex B. In order to make clear that such countries could then trade, the emissions trading article then had to say that trading was possible among "Annex B" Parties. Even in the absence of Article 10, this Article can be read to allow trading among Parties, provided they are listed with a target in Annex B. As such, a developing country could presumably propose an amendment to Annex B with its target; if it were adopted and entered into force, it would seem to be able to trade.

Article 17 (Non-Compliance)

- o This Article provides for the COP/MOP to approve appropriate and effective procedures and mechanisms to determine and address cases of non-compliance. Pursuant to a U.S. proposal, the task includes development of an indicative list of consequences for non-compliance, taking into account the cause, type, degree and frequency of non-compliance.
- o It also provides that any binding consequences need to be adopted through an amendment.
- This provision was a compromise between two views. Some considered that the COP/MOP ought to be authorized to establish binding penalties through decision. Our view was that binding consequences of non-compliance should be spelled out in the Protocol itself (such as our borrowing proposal) and that it was not appropriate (or likely to be acceptable to the Senate) to establish binding penalties through decisions. The compromise provides for the option of binding penalties, but makes clear that they would need to go through the normal amendment procedure.

Article 18 (Dispute Settlement)

- o This Article incorporates by reference the Convention's provisions on dispute settlement. Technically, this Article was not necessary, given that Article 14 of the Convention provides that

"the provisions of this Article shall apply to any related legal instrument which the Conference of the Parties may adopt, unless the instrument provides otherwise."

- o Article 14 of the Convention (and this Article, by reference) provides for Parties to settle disputes through negotiation or other peaceful means. Parties may further opt to settle disputes through binding arbitration and/or the International Court of Justice. In the case of Parties that have not settled a dispute and have not opted for other settlement means, the dispute is to be submitted to non-binding conciliation.

Article 19 (Amendments)

- o Amendments may be adopted by a three-fourths majority of Parties present and voting and enter into force for those Parties having accepted it ninety days after instruments of acceptance have been received from at least three-fourths of the Parties.

Article 20 (Annexes)

- o Consistent with numerous other international agreements, this Article provides for a special, quicker procedure for adding/amending annexes. In sum, in exchange for being restricted to material that is "scientific, technical, procedural or administrative," such annexes may be added/amended without going through ratification; a Party that does not want to be bound simply "opts out."
- o The original Annexes to the Protocol (Annex A on gases and Annex B on targets) are not, however, scientific, technical, etc. They are extremely substantive. Thus, this Article makes clear that the simplified procedure does not apply to them. Any amendment to these Annexes would need to go through the normal amendment procedure under Article 19.

Article 21 (Voting)

- o This Article reflects the standard voting provision -- each Party has one vote, except that regional economic integration organizations (such as the EU) do not get an extra vote.

Article 22 (Depositary)

- o The UN Secretary-General will be the Depositary.

Article 23 (Signature)

- o The Protocol will be open for signature at UN Headquarters in New York from March 16, 1998, to March 15, 1999. It is only open for signature and ratification by States and regional economic integration organizations that are Parties to the Convention.

Article 24 (Entry into Force)

- o This Article provides that there are two requirements for entry into force:
 - at least 55 Parties to the Convention must have submitted their instruments of ratification, acceptance, etc.; and
 - those having ratified, etc., must include Annex I Parties that accounted in total for at least 55% of total CO2 emissions for 1990 of Annex I Parties (to be determined in accordance with the first national communications of such Parties submitted under the Convention).

Article 25 (Reservations)

- o This Article provides that no reservations may be made to the Protocol. The United States opposed this Article, but did not prevail.

Article 26 (Withdrawal)

- o A Party may withdraw three years after the Protocol entered into force for it; such withdrawal becomes effective one year after notification of withdrawal.

Article 27 (Languages)

- o The six official UN languages are equally authentic.

Annex A (Gases)

- o This Annex (which is referred to in Article 3 in describing the target obligation) contains the six major greenhouse gases, as well as the sectors/source categories that are covered.

Annex B (Target Commitments)

- o This Annex lists Parties with target commitments, as well as the percentage of the base year to which they have committed.
- o Initially, the list contains only Annex I Parties (minus Turkey), but could be amended to include Parties that are not Annex I Parties.

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The Design of Post-Kyoto EMF Scenarios

An Activity of the

Target and Burden Sharing Study Group of
EMF 16: Integrated Assessment of Climate Change -
Post-Kyoto Analyses

Outline

- Rationale for Post Kyoto EMF Scenarios
- Summary Description of New Scenarios
- Reporting Regions
- Variables to be Reported/Compared

During the First Part of 1998 We Will Pursue a Two-track Course of Action to the Design of Post-Kyoto EMF Scenarios

- Initially, parameterize the assumptions made about the potential for off-sets to the year 2010 carbon equivalents targets from sinks and non-carbon GHGs .
- Collect information and analysis on sinks and the non-carbon GHGs to enable the modeling teams to endogenize them in subsequent model comparison scenarios.

Three Types of Scenarios

1 Modelers Reference Scenario

2 Kyoto Implementations

- Vary Assumptions About Sinks
- Vary Assumptions About Other GHGs
- Vary Assumptions About Emissions Trading
- Vary Post-Kyoto Objectives and Commitments

3 Alternatives to Kyoto Style Scenarios

Maximum Sink Potentials

- United States: 300 MMT
- European Union/Western Europe: 150 MMT
- Japan: 0
- Canada/Australia/New Zealand: 300 MMT
- Eastern Europe/Former Soviet Union: 300 MMT
- China: 300 MMT
- India: 300 MMT
- Mexico & OPEC: 300 MMT
- Rest of World: 300 MMT

Three Sets of Sink Assumptions

Reference $1/6$ Maximum Potentials in 2010
& $1/3$ in 2020-2100.

Pessimistic 0 in All Years

Optimistic $2/3$ Maximum Potential in 2010
& Maximum Potential in 2020-2100.

Three Sets of Assumptions About Reductions in Emissions of Other Greenhouse Gases

Reductions in other greenhouse gases covered by the protocol result in a

- -10%,
- 0%,
- or +10%

change in the carbon equivalents target for each Annex I countries specified in the protocol in 2010

Three Different Levels of International Emissions Trading

No Trading Among Countries/Regions,

Annex I Trading,

- Annex I Country/regions Allowed to Satisfy No More Than 1/3 of Its Emission Reduction Requirements With Purchased Emissions Rights.
- Sinks Increase Non-Annex I Baselines by 10% and Each Non-Annex I Country is Permitted to Sell Emissions Rights via the Clean Development Mechanism up 15% of the Amount it Would Sell Under a Full Global Emissions Trading Regime.

Full Global Trading With No Restrictions.

Two Options for the Required Emission Reduction Beyond 2010

- Freezing Commitments At The 2010 Level, Or
- Pursuing an Emissions Trajectory That Leads To Stabilization of the CO₂ Concentration in the Atmosphere at 550 PPM Driven By:
 - Further Emission Reductions By Annex I Countries
 - A Graduation Clause Based On Income For The Non-Annex I Countries That Would Lead To Them Reduce Emissions As Well.

Two Cost Minimizing Scenarios

- Follow the Kyoto protocol targets through 2010 and then minimize the cost of limiting the concentration of CO₂ in the atmosphere to no more than 550 PPM.
- Minimize the cost of limiting the concentration of CO₂ in the atmosphere to 550 PPM without observing the targets proposed in the Kyoto protocol.

Scenario	Offset Provided by Other GHGs	Contribution of Sinks	Emissions Trading	Post-2010 Objectives
1. Modelers Reference	Run your normal emissions reference case (using your preferred set of population, economic, and energy inputs) assuming the Kyoto protocol is never implemented.			
2. Kyoto Reference	0%	1/6 (1/3) of Max. Potentials In 2010 (2020-)	Annex I Only (See Specification Above)	Kyoto Forever
3. Minimum Offsets	-10%	0	Annex I Only (See Specification Above)	Kyoto Forever
4. Maximum Offsets	+10%	2/3 (All) of Max. Potentials in 2010 (2020-)	Annex I Only (See Specification Above)	Kyoto Forever
5. No Trading	0%	1/6 (1/3) of Max. Potentials In 2010 (2020-)	None	Kyoto Forever
6. Global Trading	0%	1/6 (1/3) of Max. Potentials In 2010 (2020-)	Full Global Trading	Kyoto Forever
7. 550 PPM CO2 Limit	0%	1/6 (1/3) of Max. Potentials In 2010 (2020-)	Annex I Only (See Specification Above)	Kyoto, Then Limit CO2 to 550 PPM
8. Kyoto Plus Min. Cost 550 PPM	0%	1/6 (1/3) of Max. Potentials In 2010 (2020-)	Annex I Only (See Specification Above)	Kyoto, Then Min. Cost of 550 PPM
9. Min. Cost 550 PPM Limit	0%	1/6 (1/3) of Max. Potentials In 2010 (2020-)	Annex I Only (See Specification Above)	Min. Cost of 550 PPM

Regions for Which Results Are to be Reported

- US
- OECD- Europe
- CANZ
- Japan
- OECD Total
- EEFSU
- non-OECD Annex 1
- Annex 1
- China
- India
- Mexico & OPEC
- ROW
- Non-Annex 1
- Non-OECD Total

Variables for Which Results Are to Be Reported

- Carbon Taxes/Emissions Rights Purchase Costs
- Emissions
- Total Primary Energy
- Total Fossil Fuel Primary Energy
- Emissions Rights Bought/Sold
- GDP
- Macroeconomic Consumption
- Discounted Present Value of Loss in Macroeconomic Consumption

◦ E prices

Research Briefs

RESOURCES FOR THE FUTURE

*Ancillary
Benefits*

Impacts of Climate Change Mitigation on Other Environmental Problems

Mitigation policies for reducing the risks of climate change may have a variety of other effects on the environment. For example, policies to promote energy efficiency also are likely to reduce pollution associated with energy use, which can improve air quality and reduce harmful water pollution. Some effects could prove harmful, such as an increase in exposure to indoor radon from tighter buildings that may be constructed to improve energy efficiency or to avoid the effects of climate change. Similarly, wetlands could be damaged from the construction of floodwalls. Climate change may also alter baseline conditions for pollution risks -- that is, a warmer climate could enhance the formation of harmful pollutants under some conditions.

Building on recent research that has assessed pollution rates for specific industries and established the importance of regional characteristics in factoring the impact and costs of pollution, researchers at Resources for the Future (RFF) are examining this issue of co-control benefits. They are analyzing changes in the structure and regulation of the electric utility industry to provide a more comprehensive characterization of the benefits of different policies.

Several recent studies have employed dynamic computable general equilibrium models of the United States economy to estimate the compliance costs of various policies to reduce carbon dioxide (CO₂) emissions. An important aspect of these policies, says RFF's Dallas Burtraw, project coordinator, is the non-climate change benefits that may result. Preliminary research has looked at how these mitigation policies could affect emissions of pollutants other than CO₂ as well as possible economic benefits. But, says Burtraw, it has not accounted for regional profiles of emissions and their associated environmental impacts.

In the project's first phase, researchers are investigating how emissions of NO_x and sulfur dioxide (SO₂) and concentrations of related pollutants associated with different CO₂ control policies are affected by restructuring in the U.S. electric industry. They are using the regional power trading and reduced form atmospheric transport components of PREMIERE (Primary Regional Environmental Model in Electricity Restructuring), a model developed at RFF to analyze the effects of increased inter-region power trading on regional air pollution as a result of restructuring.

In the project's next phase, researchers are creating a simulation model that

takes selected results from CGE models, and adds a state or regional profile for projected changes in economic activity and associated emissions. This revised model will also include a library that shows geographic and demographic changes in population that are expected over time, and a reduced form atmospheric transport model to track concentrations of various pollutants, similar to the one constructed in PREMIERE.

Finally, researchers will use this model to incorporate RFF's health benefits model and other environmental models to construct a geographic and temporal profile of co-control benefits. Uncertainty will be explicitly modeled using a Monte Carlo analysis. The model will then be used in subsequent phases to investigate a variety of climate-related policy instruments. They seek to estimate their nonclimate-related benefits and test the validity of average estimates for economic benefits that have been used in previous studies. Researchers will pay special attention to co-control benefits in an international context, and, where possible, will develop new "rules of thumb" for transferring benefit estimates to other venues.

The project is part of RFF's Climate Economics and Policy Program, which aims to increase understanding and knowledge of the complex issues that must be addressed to design appropriate domestic and international climate change policies that are reliable and efficient.

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* Many discussions of nitrogen-based air pollution refer to nitric oxide (NO) and nitrogen dioxide (NO₂) together as nitrogen oxides (NO_x). NO₂ is a brownish gas which is produced when NO emitted from power plants combines with oxygen already in the atmosphere. In the presence of sunlight and volatile organic compounds, NO₂ can contribute to the formation of ground-level ozone, or smog. NO_x can transform to nitrates in the atmosphere which, as a fine particulate, has effects on human health. Of the three electricity-related pollutants most responsible for current environmental damage -- NO_x, particulates, and sulfur dioxide -- NO_x currently merit the most immediate policy attention because emissions of NO_x are neither capped by environmental regulation nor controlled as effectively as particulates with current technology.

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FEATURE

The Kyoto Protocol: Unresolved Issues

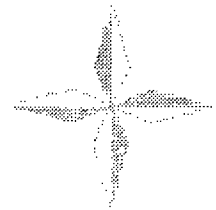
By Raymond J. Kopp, Richard D. Morgenstern
and Michael A. Toman

JANUARY 8, 1998 -- On December 10 1997, 160 nations reached an historic agreement in Kyoto, Japan on limiting emissions of carbon dioxide and other "greenhouse gases." The Kyoto Protocol calls for the industrialized nations — the so-called Annex I countries — to reduce their average national emissions over the period 2008-2012 to about five percent below 1990 levels. The U.S. pledged to reduce its emissions by seven percent below 1990, slightly less than the European Union and slightly more than Japan. The Protocol permits some industrialized nations to modestly increase their emissions and makes special provisions for the members of the former Soviet Bloc. None of the developing countries, including those with large and growing emissions such as India and China, is required to limit its emissions.

The protocol is broader than previous agreements in that it includes all the major greenhouse gases and takes into account emission changes resulting from changes in forest and land use patterns. The Protocol also contains the elements of a program for international trading of greenhouse gas emissions. Such trading would employ market incentives to help ensure that the lowest-cost opportunities for emissions reductions are pursued.

The Kyoto agreement is a significant victory for advocates who have sought to convince world leaders to address climate change. It is intended to signal to governments, businesses, and households that limits will be placed on future emissions of greenhouse gases, and that now is the time to begin developing the necessary technologies. Advocates also express the hope that acceptance by industrialized countries of binding emission limits would make developing countries more willing to take emissions-limiting actions appropriate to their own circumstances.

A protocol that is both workable in practice and capable of being ratified by the Senate must come to grips with three basic



questions:

- Does it represent a sound framework for attaining long term global emission-reduction goals, and is it clear enough to serve as a sort of international contract to which parties can commit?
- How costly are the targets and timetables for greenhouse gas reduction agreed to by the U.S. and other Annex 1 countries – are they as affordable as the Administration says, or as burdensome as the fossil fuel industry has asserted?
- What measures would the U.S. deploy in order to achieve the goals laid out in the Protocol?

As we discuss in the balance of the article, the Protocol itself has significant gaps; the costs of meeting the stipulated targets are not tremendous but not trivial either; and there is a great deal still to settle with respect to the domestic policy agenda.

Unresolved Issues with the Protocol



The negotiators deferred action on several important but controversial elements to a subsequent meeting scheduled for the Buenos Aires in the fall of 1998. President Clinton has indicated that he will not send the Protocol to the U.S. Senate for ratification until more progress is made on these issues. We believe that, at a minimum, several issues must be addressed before ratification and implementation can occur:

The rules and institutions that will govern international trading of greenhouse gas emissions among Annex I countries must be better established. Article 6 of the Protocol provides for emissions trading, but only in the vaguest of terms. How the trading program is carried out greatly affects the capacity to hold down compliance costs. A program that establishes a freely functioning, largely private market in emissions permits, where private entities may execute trades with minimal bureaucratic red tape, will be the most efficient and will lead to the greatest cost savings. In contrast, a market permitting only trades by governments, or a market where private trades are hamstrung by overly restrictive rules, will sap the cost savings.

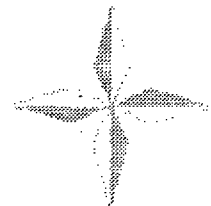
The rules and institutions governing joint implementation (the so-called Clean Development Mechanism) must be developed in detail. Under Article 12 of the Protocol, Annex I countries can jointly undertake projects with developing countries

to reduce emissions in the latter countries, and count those reductions toward compliance with their own commitments, where it is possible to establish meaningful baselines against which reductions can be measured. Again, however, the Protocol does not address how such projects can be undertaken. A well supervised, but freely functioning market combined with credible certification and enforcement of reductions would yield real greenhouse gas reductions at lower cost. An overly restrictive and bureaucratic system would sap possible gains.

The criteria used to judge compliance, and any penalties for noncompliance, must be clearly articulated. The protocol contains a number of technical provisions for assessing national performance in measuring emissions and meeting emissions control objectives. These provisions build on previous efforts under the Framework Convention but are complicated by the more comprehensive nature of the new protocol. Beyond these technical questions, the fundamental issue is what actions, if any, would be taken if a country was found not to be in compliance. The emissions goals of Annex I countries are taken to be binding under international law, but the protocol itself contains no stipulations for sanctions in the event of noncompliance.

A binding agreement on the part of the major developing countries to limit their emissions at some specified point in the future must be obtained. The Framework Convention clearly states that developing countries do not bear the same obligations as developed nations for emissions control in the short term. Nevertheless, the Protocol could and should contain commitments from developing countries to limit their emissions *growth*. This can be achieved through the pursuit of "no regrets" measures that would be prudent to undertake in any case, and agreements to eventually cap emissions as countries' economic circumstances improve in exchange for assistance in adopting clean technologies. The lack of any early commitment by developing countries not only aggravates short-term concerns in the U.S. and other industrial countries about international competitiveness, but also raises the specter of developing countries becoming "locked in" to more fossil-fuel-intensive technologies.

To make longer-term objectives more credible, moderate but specific near-term goals should be set for Annex I countries and these countries should be able to use early emissions reductions to meet longer-term requirements. Other than a passing reference in Article 3 to the need for "demonstrable progress" in achieving commitments by 2005, the Protocol is silent on interim measures. Yet, without interim targets, prospects for achieving more ambitious longer-term goals become



problematic, and the incentives to engage in long-term investments in new capital and technology are undercut. Incentives for cost-effective reductions before 2008 to meet long-term requirements also are limited since the Protocol makes no provision for emitters to "bank" such reductions.

Raymond J. Kopp directs RFF's *Quality of the Environment Division*, where *Richard D. Morgenstern* is a visiting scholar on leave from the U.S. Environmental Protection Agency. *Michael A. Toman* directs RFF's *Energy and Natural Resources Division*.

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FEATURE

The Kyoto Protocol: The Realities of Implementation

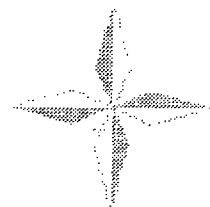
By Raymond J. Kopp, Richard D. Morgenstern
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JANUARY 15, 1998 -- In the runup to Kyoto, a number of experts pointed out that both the environment and the economy might be served by following a slower path to emissions control than the Protocol stipulates, while developing the technologies for more aggressive and affordable emissions reductions later. Others disputed this view. In any event, the agreement reached in Kyoto sets the stage for discussion and for future debate in the Senate.

Some partisans have claimed that meeting the Protocol's targets ultimately will be inexpensive or even free because there is a large untapped reservoir of cheap energy-efficiency opportunities available today and new technologies will materialize in the near future. Other partisans predict economic collapse.

In our judgment, while neither extreme view is correct, there is a substantial likelihood that the proposed target and timetable will impose significant costs on the U.S. and the global economy, even after accounting for new technology stimulated by domestic policies. The limit agreed to by the U.S. implies a reduction of about one-third compared to what the U.S. Department of Energy estimates carbon dioxide emissions will be by the end of the next



decade. Even with the flexibility to reduce emissions of other gases, achieving emissions reductions of such magnitudes in at most 15 years will lead to higher energy prices and thus costs that will be borne throughout the economy. These costs in turn will also give rise to serious debates about fairness. Recent public opinion polling indicates increased concern about climate change and some willingness to shoulder burdens to curb greenhouse gas emissions, but there is no compelling evidence that the public is ready to accept significant increases in energy prices or other costs. In light of these costs, it is an open question whether the Senate is willing to ratify the target and timetable stipulated in the Protocol.

A First Step Toward Implementation: Understand the Benefits and Costs

An important first step in fostering a productive debate nationally and in the Senate over the Protocol is better understanding of its benefits and costs. Advocates should dispense with the pretense that emissions reductions of the scale and speed proposed can be achieved at negligible or even negative cost, or that reductions necessarily doom the economy. To shine a brighter light on the costs and consequences of the Protocol requires an investment in better and more inclusive analysis and review of estimates, so that competing claims can be adjudicated and new ideas introduced.

Even after questions about the Protocol itself are settled, domestic policy options for achieving the targets and timetables require more thorough consideration. The U.S. deserves credit for advancing some specific measures. Still, the proposal the Administration offered in October – \$5 billion in incentives for new technology – will not be enough to move the economy from where it is today to where it needs to be to meet the Kyoto goals.

Ultimately, if the U.S. is to even approach the Kyoto goals, energy prices must rise enough – especially for coal, the most carbon-rich fossil fuel – to induce enough conservation, energy efficiency, fuel switching, and the development and deployment of new technologies and energy forms. How large this price rise will have to be depends on what domestic policies are used. No agreement yet exists on this policy menu. Even if an efficient mechanism like emissions trading is used within the U.S., important questions of who gains and loses from the policy remain to be settled.



The Key to Cost-Effective Climate Policy: Market Incentives

To meet the Kyoto goals as cost-effectively as possible, the Clinton Administration should commit itself to the use of incentive-based market policies for domestic emissions control. Well-intentioned but costly proposals to mandate energy efficiency through rigid command-and-control measures must be avoided. In addition, policies aimed at encouraging the development and dissemination of low-emissions technology need careful scrutiny to avoid waste (for example, through an ill-focussed subsidy policy).

The institution of some modest interim measures to limit greenhouse gases would be important for establishing the credibility of longer-term reduction goals. A domestic emissions trading program with looser controls than are required by the Protocol is one example. Such a program would be combined with a "safety valve" that would cap the price of a tradable emissions permit at some prespecified level which would rise over time, with the government offering additional emissions permits as needed to maintain the price caps.

Such an approach is complementary to the policies the Administration already has announced and would provide valuable information about how emissions control policies work as well as their costs to the economy. It also would offer such near-term benefits as improved air quality from reduced conventional air pollutants and encouragement for the development of lower-emissions technologies. Even stronger incentives for early demonstrable progress would be provided if any early emissions reductions below an established baseline (for example, actual 1997 emissions levels) could be banked for use in meeting subsequent binding constraints.

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The Effects of Purchasing Constraints on International Trading

One proposal discussed at Kyoto would require Annex I countries to make at least one-half of their emissions reductions domestically. To assess the effect of a required 50% domestic emissions reduction restriction, U.S. permit price and abatement cost estimates were calculated for several different permit trading blocs (full Annex I and two Umbrella variants).¹ While these trading blocs result in different selling prices on the international market, they all result in the same U.S. domestic permit price given a comparable sinks assumption, since the 50% restriction is binding. Further, any restricted trading scenario that includes Annex I trading and JI with developing countries would result in the same U.S. permit price.

Table 1. U.S. Permit Prices under Restricted International Trade

Scenario	U.S. Sinks ¹ (MMTCE)	U.S. Permit Price	Domestic Reductions	Permits Purchased Abroad	Domestic Abatement Cost
Annex I Trading, No Restrictions	0	\$48/ton	281	319	\$6.7 b
Umbrella - EU, EE, No Restrictions	0	\$43/ton	258	342	\$5.5 b
Umbrella - EU, No Restrictions	0	\$26/ton	187	413	\$2.4 b
Annex I Trading, 50% Restriction ²	0	\$52/ton	300	300	\$7.8 b
Annex I Trading, No Restrictions	52	\$26/ton	187	361	\$2.4 b
Umbrella - EU, EE, No Restrictions	52	\$20/ton	157	391	\$1.6 b
Umbrella - EU, No Restrictions	52	\$11/ton	95	453	\$0.5 b
Annex I Trading, 50% Restriction	52	\$41/ton	248	300	\$5.1 b
Annex I Trading, No Restrictions	104	\$11/ton	95	401	\$0.5 b
Umbrella - EU, EE, No Restrictions	104	\$5/ton	51	445	\$0.1 b
Umbrella - EU, No Restrictions	104	paper tons > demand	n/a	n/a	n/a
Annex I Trading, 50% Restriction	104	\$28/ton	196	300	\$2.7 b

¹ Three sink estimates are used. The first, to provide an upper bound on permit price and cost, assumes that all countries' sinks yield a net zero under the Kyoto sinks definition. The last value reflects EPA estimates of above-ground sequestration and wood in use and in landfills. Corresponding estimates for other countries are based on their land use change and forestry activities estimates in the national communications. The middle value is simply half of the last value for all countries.

² The U.S. permit price and domestic abatement cost are the same for an Umbrella that excludes the E.U. and an Umbrella that excludes the E.U. and Eastern European countries.

¹ The methodology for constructing the new baselines under the Kyoto Protocol will be discussed in the baselines meeting. Refer to the next page for a brief overview.

- Under this 50% restriction, the clearing price in the international market is much lower than the U.S. price, and in many cases paper tons exceed the amount of emissions rights all buying countries are allowed to buy.
- The 50% restriction has more significant consequences on U.S. abatement costs with larger estimates of sinks, especially under the Umbrella trading blocs, since sinks may play a key role in driving down the international permit price.
- Since the U.S. is modeled as the low-cost abater, the 50% constraint, while it is binding on the U.S., has much stronger effects on other countries. For example, in the no sinks case, under restricted Annex I trading, the Japanese domestic permit price jumps threefold relative to an unconstrained Annex I trading regime.
- Finally, constructing the baseline, to identify "half" of emissions reductions, is important.

Methodology

U.S. Baseline: Kyoto mandates that the U.S. reduces its emissions (through domestic abatement, international trading, and joint implementation) to -7% of its 1990 levels for six categories of gases, net of the effects of certain sinks. Not accounting for carbon sinks, the U.S. will need to abate an annual average of about 600 MMTCE over the 2008-2012 commitment period. The following chart illustrates this target relative to business as usual.²

Table 2. U.S. Greenhouse Gas Emissions, 1990/95 Baseline and 2010 BAU (MMTCE)

Gas/Sinks	1990/95 Emissions	-7% of 1990/95	2010 BAU Emissions
CO ₂	1374		1838
CH ₄	181		152
N ₂ O	38		34
HFCs, PFCs, SF ₆	36		91
Kyoto Sinks	n/a		?
Total	1629	1515	2115

Sources: AEO98, 1997 Climate Action Report

² The 1990 and 1995 numbers reflect EIA data, and thus differ some from those provided in the 1997 Climate Action Report.

Preliminary Draft, January 13, 1998

Other Countries' Baselines: Baselines for other Annex I countries were constructed from SGM BAU projections of carbon dioxide, greenhouse gas and sinks inventories and projections in national communications, Climate Change 1995 (IPCC 1996), and CEA projections.

Abatement Cost Curves: For carbon dioxide, model outputs from SGM were used to construct marginal abatement cost curves for each country. In addition, a marginal cost curve for the other five categories of gases and sinks developed by EPA was used to construct the U.S. greenhouse gas abatement cost curve. For all other countries, their carbon dioxide cost curves proxied as greenhouse gas cost curves (resulting in a slight upward bias on the market clearing price for permits). Total abatement costs are calculated assuming a linear cost curve.

**Carbon Sinks:
Analysis of the Kyoto Protocol**

U.S. Sink Source	Annual MMTCE Carbon Sequestration or Emissions during the budget period (BAU Case)		
	2008-2012	2013-2017	2018-2022
Alternative 1: Literal definition -- Include regeneration of harvested forest lands, exclude carbon harvested from existing forest			
Afforestation (Established since 1990)	31	33	33
Reforestation (Forests replanted since 1990)	59	97	137
Deforestation	-40	-40	-33
Alternative 1 Total	50	90	137
Alternative 2: Reforestation with harvest -- Include regeneration of harvested forest, include carbon emitted from harvesting, account for wood use, no aggregate growth			
Afforestation (Established since 1990)	31	33	33
Reforestation, includes harvest (Forests replanted since 1990)	-50	-14	26
Deforestation	-40	-40	-33
Alternative 2 Total	-59	-21	26
Alternative 3: New Forest Accounting -- Exclude existing forest lands and only count new forests and deforestation			
Afforestation and reforestation (New forests established since 1990)	31	33	33
Deforestation	-40	-40	-33
Alternative 3 Total	-9	-7	0
Alternative 4: Define "activities" as new and additional projects (BAU impact = 0)			
Alternative 5: Explicitly add more activities to list in future negotiations			

Introduction -- the scope of our commitment

Under the Kyoto Protocol, the United States must reduce net greenhouse gas emissions to an average of [about 1494] million metric tons of carbon equivalent (MMTCE) over the 2008 to 2012 budget period. These emissions represent an average annual departure from the 1990 base year of about 560 MMTCE annually in the five years of the first commitment period.

Emissions Budget = 5 years × (1990 Emissions of CO₂, CH₄, N₂O + 1995 Emissions of HFC, PFC, and SF₆) × 93% [excludes land use change and forestry]

2008-2012

Commitment = [Total emissions of CO₂, CH₄, N₂O, HFC, PFC, SF₆ 2008-2012] - [net changes carbon stocks from forests due to afforestation, deforestation and reforestation]

The accounting system for forests and land use change in the Kyoto Protocol is significantly different from accounting methods previously used by the US. These changes have significant implications for the magnitude of baseline US emissions growth and for defining actions that can be used to offset emissions. The most significant change is that Parties are no longer required to subtract carbon sequestration that occurred in the base year in determining their budgeted amount of emissions. This change provided a benefit to the US of 55 MMTCE in 2010 (3% of our overall emissions). In addition, the Kyoto Protocol requires that forest and land use change activities be used to meet a Parties commitments but limits activities to: afforestation, reforestation and deforestation activities since 1990. Under the agreement, Parties must count greenhouse gas emissions and removals that...

“[result] from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation, and deforestation since 1990, measured as verifiable changes in stocks in each commitment period.”

The Parties to the protocol could interpret the activity list (afforestation, reforestation, and deforestation) several different ways with potentially with very different contributions of sinks in the baseline, as well as different opportunities to credit increases in sinks with targeted forest polices. The purpose of this paper is to explain the Kyoto sinks language and evaluate alternative interpretations and, where possible, net sequestration effects for the U.S. We will be working on analogous numbers for other key countries.

This paper describes four alternative sets of definitions for the activity list, and an additional strategy to offset concerns that a literal interpretation represents a big loophole. Each set of definitions has pros and cons. Under any of the proposed alternatives, the US either gains or is not much worse off than the negotiating team anticipated in Kyoto. This does not mean that there are not problems with the language. Indeed, each alternative has problems that can only be addressed in the context of long-term changes to the Kyoto Protocol language, which may necessitate amending the forest and land use activity list (as requested in Article 3.4 of the Protocol). It is expected that this issue will be a top priority of negotiators at the upcoming Meeting of the Parties (MOP) in Buenos Aires, in November, 1998.

Options for Defining Forest and Land Use Activities

Note that any of the definitions in Alternatives 1 through 4 could be chosen as our current position, but considered provisional until the Protocol language can be amended in Buenos Aires or subsequent meetings. Alternative 5 looks at ways in which the language could be changed to address concerns with Alternatives 1 through 4.

Alternative 1: Literal definition.

Include regeneration of harvested forest lands, exclude carbon harvested from existing forest lands.

Afforestation: planting or other human-induced forest establishment on lands not in forest.

Reforestation: planting or other human-induced forest regeneration after harvest of other forest disturbance.

Deforestation: conversion of forest lands to other uses.

Pros:

- This set of definitions produces the biggest carbon bonus
- Consistent with forestry terminology used in the United States
- Consistent with agreement to exclude harvesting (negotiated in contact groups during the negotiations)
- Allows some activities on forest lands (e.g. regeneration) to be given credit

Cons:

- Does not accurately represent the impact of activities on the environment. Carbon emissions/sequestrations from some significant forest activities are excluded.
- Creates national incentives to prematurely harvest lands to get lands into the post-1990 base.
- Lands that are partially cut may not update land into the post-1990 base, whereas lands

that are clear cut definitely will, thus penalizing more environmentally sensitive practices.

Alternative 2: Reforestation with harvest.

Include regeneration of harvested forest lands in definition of reforestation, but also include carbon from harvesting existing forest lands. Account for emissions from harvested wood.

Afforestation: planting or other human-induced forest establishment on lands not in forest.

Reforestation: planting or other human-induced forest regeneration after harvest or other forest disturbance, including carbon emissions from harvesting activities.

Deforestation: conversion of forest lands to other uses.

Pros:

- The national incentive to prematurely harvest forest lands is lowered
- System recognizes changes in what happens to carbon in harvested wood

Cons:

- May be inconsistent with negotiations that explicitly excluded carbon from harvesting.
- May still provide incentives to clear cut (if lands that are sustainably managed do not qualify).
- By not counting aggregate regrowth of pre-1990 forests, sinks are negative in first two commitment periods

Alternative 3: New Forest Accounting

Exclude existing forest lands. Only count new forests and deforestation.

Pros:

- Eliminates the national incentive to harvest since regeneration of harvested lands is not considered "reforestation" under this definition
- Eliminates the loophole from counting carbon sequestered by replanted harvested lands, but not subtracting the carbon that is harvested
- Focuses only on baseline changes in forest cover to be credited.

Cons:

- Not all existing forest lands are included.
- Does not accurately represent the impact of activities on the environment. Carbon emissions/sequestration from most commercial forest activities are excluded.
- Sinks are negative, but small, in the first two budget periods.

Alternative 4: Define "Activities" as "Projects"

Under this interpretation, the US will essentially disregard baseline trends in forest and land use change and focus on specific actions that will increase carbon sequestration. This approach is consistent with the interpretation used in Kyoto that allowed the US to agree to a 7% reduction from 1990 levels -- which took no credit for forest and land use change carbon.

Pros:

- Allows for forest carbon sequestration projects
- Greatly simplifies what we need to account for
- Only provides positive sinks, albeit small

Cons:

- Possibly inconsistent with negotiating history
- Doesn't count baseline trends
- No disincentive to emit carbon from sinks, e.g. harvest and deforestation
- Ignores the effect of projects on non-project lands (e.g. leakage)
- Hard to measure as "verifiable changes in stocks" as required by Article 3.3

Alternative 5: Plan to revise the Protocol language to include more activities.

In Buenos Aires, the U.S. may propose to add additional activities to the list of qualifying forestry activities, whose net contribution to sinks may be positive or negative. The primary purpose of including additional forestry activities would be to (1) make the accounting more comprehensive and scientifically sound, and (2) to eliminate perverse national incentives created by leaving out key carbon-influencing activities. Some examples of possible additional activities:

1. Forest management, including aggregate regrowth of existing forest
2. Change the "since 1990" to "since 1900", or some other date
3. Conservation
4. Agricultural soil management
5. Harvesting (only if we can get other changes to account for sequestered carbon)

Pros:

- If done well, we could fix a number of the problems mentioned above.

Cons:

- If not done well, amended language could be just as bad if not worse.
- Provides no guidance on provisional definitions until language is amended.

Appendix A -- Key Word Analysis of Forest and Land Use Change Language

- **“since 1990”**

This phrase restricts the sources of carbon sequestration to only those that result from the listed forestry activities that took place since 1990. For instance, the carbon sequestered in the budget period by 50 acres of forest planted in 1989 cannot be included in our positive sinks since the trees were planted before 1990. As the budget period commences, each annual cohort of trees planted in the years after 1990 sequesters an amount of carbon based on its acreage, age, and other characteristics.

Since the overwhelming majority of U.S. forests were established before 1990, the phrase “since 1990” severely limits the carbon sequestration we may count as positive sinks. Other countries, such as New Zealand, Canada, and Sweden, have experienced much more rapid forest turnover (a shorter forest harvest cycle) or much greater reforestation and afforestation since 1990 than the U.S. For those countries, the share of their net actual sequestration that “counts” under the protocol is much higher than for the U.S., making the U.S. relatively disadvantaged by this language.

- **“measured as verifiable changes in stocks”**

This language may exclude future consideration of “conservation” activities as a positive sink, either in the current language or under an amended list. Conservation activities protect current stocks, and would be most accurately reflected in higher levels of stock or lower rates at which they decline.

- **“in each commitment period”**

This phrase restricts qualifying sinks to those that occur in the budget period. So, for example, if we deliberately burned down 1000 acres in 1998, those negative sinks (emissions) would not count against us at any time. Likewise, if we replanted the forest as soon as we burned it down in 1998, the carbon sequestered by the growth of the young forest over the budget period would count as positive sinks. If we burned down 1000 acres in a budget period, the negative sinks would count against us in that five year commitment period, but no other.

“In each commitment period” appears to rule out accounting approaches that annualize the aggregate expected sinks from a given forestry activity, rather than counting the marginal sequestration on a year by year basis.