STRAWMAN ELEMENTS: AN ASSESSMENT

POSSIBLE APPROACHES TO ADVANCING INTERNATIONAL CLIMATE CHANGE EFFORTS

Prepared for the

CLIMATE DIALOGUE AT POCANTICO

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INTRODUCTION

This paper is prepared as input to the Climate Dialogue at Pocantico, a series of discussions among senior policymakers and stakeholders from 15 countries exploring options for advancing the international effort against climate change.

The central focus of the dialogue is the development and assessment of a range of "strawman" proposals for strengthening the international climate effort. As a first step in the development of these strawmen, an earlier paper presented a set of brief conceptual "elements." These elements were meant to serve two purposes: first, to highlight distinct approaches to addressing climate change internationally; and second, as building blocks for more comprehensive strawman proposals. They were intended not as alternatives per se, but rather as a menu of approaches that might be combined or modified any number of ways. Participants reviewed the earlier paper at Session II of the dialogue, in October 2004; some of the original elements were removed from consideration and new ones added.

This paper presents and assesses the 15 elements now under consideration within the dialogue. For each element, the paper provides a brief description of the approach, followed by a qualitative assessment based on a set of criteria endorsed by dialogue participants. Although each element is described and assessed independently, it is assumed that an effective long-term approach would entail some combination of elements, either explicitly linked or undertaken in parallel. Such "hybrid" options may be considered in a subsequent paper.

A companion paper, *Strawman Modeling*, presents the results of computer modeling of selected elements.

The 15 elements described and assessed here are:

LONG-TERM GOAL: ASPIRATIONAL "OUTPUT" GOAL

Governments, business and/or expert communities – acting individually or with like-minded parties – would articulate a quantified "aspirational" long-term goal or goals consistent with the ultimate objective of the United Nations Framework Convention on Climate Change (stabilizing greenhouse gas concentrations "at a level that would prevent dangerous anthropogenic interference with the climate system"). The function of the goal would be to spur and guide future climate efforts, rather than to serve as the basis for negotiating mitigation commitments. The goals would be framed in terms of "outputs" (environmental outcomes) rather than "inputs" (human actions to produce those outcomes). They could be expressed in terms of:

- Temperature – An upper limit on allowable change or rate of change in average global temperature (e.g. 0.1 degrees Celsius/decade or 2.5 Celsius by 2100); or
- Concentration – Stabilization of atmospheric GHGs at a given concentration level (e.g. at 450 ppm or 550 ppm).

Examples of long-term aspirational goals include: the European Union's goal of limiting average global temperature increases to 2 degrees Celsius above pre-industrial levels; and statements by BP CEO John Browne supporting a concentration goal of 500-550 ppm.

KEY PROS AND CONS

Pros:

- Provides a stronger sense of direction for the international climate effort.
- Provides an informal metric to guide and assess near- and medium-term action.
- Avoids a difficult and potentially futile negotiation over a formal quantified long-term target.
- Contributes to public awareness.

Cons:

- Spurs no immediate action.

ASSESSMENT

Environmental effectiveness

- ***Stringency of emission reductions:*** Depends on ambitiousness of goal and degree to which governments rely on it for policy-setting.
- ***Predictability of emission reductions:*** If effective as a political driver, can frame adequate near- and medium-term efforts and provide greater assurance that "dangerous" climate impacts are avoided. However, can serve only as an imprecise basis for determining required level of effort because many emission pathways could reach the same end point, and, in the case of a temperature-based goal, because of uncertainties in the links between emissions and targeted outcomes.

- ***Comprehensiveness:*** Would encompass all human activities affecting concentration or temperature.
- ***Avoidance of emission leakage:*** N/A
- ***Implementation/enforceability:*** Goal is voluntary and lacks credibility unless accompanied by enforceable short- and medium-term measures..

Economic feasibility

- ***Cost*:** Projected magnitude and timing of cost depend on ambitiousness and timing of goal, and assumptions about future technology.
- ***Cost predictability:*** A quantified goal provides some basis for projecting costs (and benefits) of overall effort. However, costs less predictable than with an emissions target.
- ***Cost-effectiveness:*** Depends on policies and emissions pathway chosen to achieve goal.

Equity/fairness

- A longer-term perspective, especially if effective in spurring near-term action, addresses inter-generational equity.
- Quantified goal could be a basis for equitable allocation of short- and medium-term mitigation effort. However, this implicit equity dimension could make it difficult to achieve broad agreement on a specific goal.

Breadth of participation

- The suggestion of a global cap, even if only aspirational, may be perceived by some countries as a constraint on growth and therefore politically unacceptable.

Robustness over time

- ***Long-term focus:*** Puts focus on desired outcome, not the nature of long-term effort needed to achieve it.
- ***Dynamic flexibility:*** Goal can and should be periodically reviewed on basis of new scientific information to ensure it is consistent with the objective of avoiding dangerous climate impacts.

Stimulation of technological change

- ***Development of new technologies:*** If broadly agreed, could spur public and private investment in research and development of long-term technologies.
- ***Diffusion of new and existing technologies:*** Effective to the degree it drives near- and medium-term action.

Complementarity

- ***UNFCCC:*** Would be direct elaboration of Article 2.
- ***Kyoto Protocol:*** Not incompatible.
- ***Established national/regional programs:*** Not incompatible.

Flexibility for different national circumstances/strategies

- Aspirational nature of goal allows countries full flexibility in determining what effort, if any, they will undertake to achieve it.

Compatibility with other national priorities

- ***Development and economic growth:*** May be perceived by some countries as a constraint on growth.
- ***Competitiveness:*** Suggestion of a global cap implies allocation of fixed quantity of allowances, which may invoke competitiveness concerns.
- ***Energy security:*** Can be an additional driver for adopting a goal.
- ***Environmental co-benefits:*** Could be significant.

Facilitation of adaptation efforts

- By focusing attention on avoidable and unavoidable climate impacts, can stimulate adaptation efforts.

LONG-TERM GOAL: SECTORAL ZERO-NET EMISSION GOALS

Countries would agree on a long-term goal (or goals) to achieve zero-net emissions in one or more sectors of the economy. Such "input" goals could be "aspirational" or could be the basis for broader sectoral agreements that elaborate nearer-term commitments aimed at achieving them. Specific examples could include:

- Zero-net emissions from the power sector by 2065.
- Zero-net emissions from the automotive sector by 2080.

KEY PROS AND CONS

Pros:

- Unlike a long-term "output" (temperature or concentration) goal, focuses on a metric subject to direct human control.
- Provides a clear statement of the challenge to be met.

Cons:

- Timeframe is remote and goal may seem overly ambitious.
- Only credible if accompanied by nearer-term measures.

ASSESSMENT

Environmental effectiveness

- ***Stringency of emission reductions:*** Depends on target date and degree to which it is binding on governments/private sector.
- ***Predictability of emission reductions:*** Provides strong predictability, if coupled with commensurate near- and medium-term measures.
- ***Comprehensiveness:*** Multiple goals would be needed to encompass all or most emissions-generating activities.
- ***Avoidance of emission leakage:*** If not carefully designed or implemented, could promote leakage from one sector to another (i.e., if energy-intensive industries switch from grid to self-generated power).
- ***Implementation/enforceability:*** Long-term commitments lack credibility unless reinforced by enforceable short- and medium-term measures.

Economic feasibility

- ***Cost:*** Depends on target date, near- and medium-term strategies for meeting it, and available technology options.
- ***Cost predictability:*** Provides a basis for projecting costs over time, although long-term projections are highly uncertain.

- ***Cost-effectiveness:*** Long-term goal provides high degree of "when" flexibility, promoting cost-effectiveness, but sectoral focus limits "what" flexibility. Most cost-effective when governments establish clear milestones and allow private sector flexibility in choice of technologies. Making the goal zero-*net* emissions provides flexibility by, for instance, allowing the use of capture-and-storage technology.

Equity/fairness

- Targeted sectors may feel they are bearing a disproportionate share of the mitigation burden.

Breadth of participation

- Agreement among a limited number of countries could encompass a large share of emissions from a given sector.
- Could help achieve broader participation than an economy-wide approach by focusing on sectors where emissions and economic dynamics are more easily understood and managed.

Robustness over time

- ***Long-term focus:*** Does not aim for a specific environmental outcome (i.e., concentration or temperature), but, by framing goal in terms of the nature and scale of effort required, can be a strong driver for action toward the ultimate objective of avoiding dangerous climate impacts.
- ***Dynamic flexibility:*** Can and should be reviewed periodically on basis of new scientific, economic, and technological information.

Stimulation of technological change

- ***Development of new technologies:*** Compared to "output" goal, provides a clearer signal to markets for research and development of sector-specific technologies.
- ***Diffusion of new and existing technologies:*** Effective, if accompanied by interim measures.

Complementarity

- ***UNFCCC:*** Compatible.
- ***Kyoto Protocol:*** Could complement Kyoto's economy-wide targets.
- ***Established national/regional programs:*** Far more ambitious than existing efforts.

Flexibility for different national circumstances/strategies

- Less flexible than an "output" target or an economy-wide approach, but within targeted sectors, governments/private sector could have flexibility in how goal is achieved.

Compatibility with other national priorities

- ***Development and economic growth:*** Likely to be viewed by targeted sectors, and some countries, as a constraint on growth.
- ***Competitiveness:*** Could help ease competitiveness concerns if there is broad participation and countries' marginal costs are comparable, but exacerbate them if marginal costs vary significantly.
- ***Energy security:*** Auto-sector target can reduce reliance on oil imports.

- ***Environmental co-benefits:*** Depends on implementation. For instance, phasing out coal combustion entirely would produce greater reductions in conventional air pollutants than allowing continued coal burning with capture-and-storage.

Facilitation of adaptation efforts

- N/A

TARGETS AND TRADING: DIFFERENTIATED TARGETS WITH GRADUATION CRITERIA

Countries would negotiate national emission targets in a multilateral framework that extends the basic approach of the Kyoto Protocol and provides a pathway towards global coverage. Countries would be categorized into groups, based on differentiation/graduation criteria such as per capita emissions, GDP per capita, and emissions intensity. Possible groups include: developed countries, middle-income developing countries, and least developed countries. Each category would have a different type of target. For example:

- Developed countries might have legally-binding, absolute emission reduction targets that comprehensively address all sources and sinks of GHGs.
- Middle-income developing countries might have dual intensity targets applicable only to carbon emissions or to the energy sector. (Dual intensity targets consist of a relatively modest, legally-binding target, as well as a more stringent, no-lose target that would be used for emission trading purposes).
- Least-developed countries might have no-lose targets for one or more sectors.

Within each category of countries, targets would be further differentiated in terms of stringency, in order to reflect particular national circumstances. As countries develop, they would graduate from one category of country to another, and would assume a different target type. Emission allowances could be traded through an international emissions trading system.

KEY PROS AND CONS

Pros:

- Builds on Kyoto.
- Elaborates pathway to global coverage.
- Emissions trading promotes cost-effectiveness.

Cons:

- Some countries may be unwilling to accept binding emission targets, particularly absolute targets.
- Binding emission targets could result in unexpectedly high costs and impose significant economic burdens.

ASSESSMENT

Environmental effectiveness

- ***Stringency of emission reductions:*** Depends on targets.
- ***Predictability of emission reductions:*** Assuming countries participated and complied, absolute emission targets would provide the most predictable level of emission reductions.
- ***Comprehensiveness:*** Targets could address all greenhouse gases or only some.
- ***Avoidance of emission leakage:*** Depends on breadth of participation.

- ***Implementation/enforceability:*** Uncertainties regarding the projected effect of mitigation measures could make national compliance, particularly with absolute targets, difficult to ensure.

Economic feasibility

- ***Total Costs:*** Would be a function of stringency of emissions targets and design of domestic implementation policies.
- ***Cost effectiveness:*** Trading, comprehensiveness, and long-time frames would enable countries to reduce emissions cost-effectively.
- ***Cost predictability:*** Because compliance costs depend on many unpredictable variables, targets could result in unexpectedly high costs, leading countries to drop out or not comply.

Equity/Fairness

- Differentiation of target types and stringency could reflect equity principles (per capita entitlements, historical responsibility, ability to pay, grandfathering, etc.).

Breadth of participation

- ***Pros:***
  - Graduation criteria would provide a pathway to global participation.
  - Dual intensity targets for middle-income countries could address concerns that emission targets might threaten economic development, while avoiding the risk of hot air.
  - Countries with low-cost emissions reductions would have incentive to participate, in order to gain access to the emissions trading market.
- ***Cons:***
  - Some countries might find any binding emissions target difficult to accept politically.
  - Some industrialized countries might be reluctant to accept absolute reduction targets, due to economic uncertainties.

Robustness over time

- ***Long-term focus:*** Rolling short-term emissions targets would not, per se, provide a long-term focus.
- ***Dynamic flexibility:*** Periodic renegotiation of targets would allow actors to learn and take account of new information, and to scale targets up or down in response.

Stimulation of technological change

- ***Development of new technologies:*** By raising costs of fossil fuel emissions, targets would provide incentives for technology development.
- ***Diffusion of new and existing technologies:*** Emissions trading would provide incentives to transfer new technologies to developing countries.

Complementarity

- ***UNFCCC:*** Fully compatible.
- ***Kyoto:*** Maximum continuity with Kyoto.
- ***Established national/regional programs:*** Target-based approach could easily integrate with domestic cap-and-trade systems.

Flexibility for different national circumstances/strategies

- All participating countries would have to accept a target-based approach.
- But countries would retain flexibility to decide how they achieve their targets, based on their national circumstances and other priorities.

Compatibility with other national priorities

- ***Development and economic growth:*** Some countries may see emission targets as limiting their economic development, particularly if the targets are absolute.
- ***Competitiveness:*** National targets could give rise to competitiveness concerns unless they are seen as comparably stringent and are implemented in a manner that does not shield export-oriented sectors. A well-functioning trading system can reduce competitiveness disparities across countries.
- ***Energy security:*** Depends on domestic implementation.
- ***Environmental co-benefits:*** Depends on domestic implementation.

Facilitation of adaptation efforts

- N/A

TARGETS AND TRADING: EMISSIONS TARGETS WITH A SAFETY VALVE

A safety valve could be added to any type of legally-binding target to allow states (and possibly individual companies or other entities) to buy additional allowances at a predetermined price. In effect, this would make the emissions target conditional: if the marginal cost of abatement rose above the safety valve level, then the target would be relaxed through the sale of additional allowances.

The safety valve price would be set by international agreement and allowances would be issued by an international body. Resulting revenues could be used to fund climate mitigation and adaptation activities, or for other designated purposes.

KEY PROS AND CONS

Pro:

- Provides greater cost certainty by capping the marginal costs of compliance, and may therefore encourage broader participation.

Con:

- Reduces environmental certainty by relaxing stringency of emission targets if safety valve price is reached.

ASSESSMENT

Environmental effectiveness

- ***Stringency of emission reductions:*** By providing protection against excessive economic costs, a safety valve could encourage countries to assume more stringent targets.
- ***Predictability of emission reductions:*** A safety valve would not assure any particular level of emissions reduction, since targets could be relaxed in the event that compliance costs prove unexpectedly high.
- ***Comprehensiveness:*** Not affected by safety valve.
- ***Avoidance of emission leakage:*** Providing an upper bound on abatement costs would limit emissions leakage.
- ***Implementation/enforceability:*** Countries would be less likely to violate their commitments or to drop out of the regime altogether, due to unexpectedly high abatement costs.

Economic feasibility

- ***Total costs:*** If safety valve utilized, would limit total costs.
- ***Cost effectiveness:*** Benefits of emissions trading not significantly affected by addition of safety valve.
- ***Cost predictability:*** A safety valve would provide predictability about the maximum marginal cost of abatement, and protect against unexpectedly high compliance costs.

Equity/Fairness

- Like other target-based approaches, differentiation of targets types and stringency could reflect equity principles.
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Breadth of participation

- Providing assurance against unexpectedly high compliance costs could remove an obstacle to participation.
- However, a safety valve may appear similar to a tax, making it politically unacceptable for some countries.

Robustness over time

- ***Long-term focus:*** Rolling short-term emissions targets would not, per se, provide a long-term focus.
- ***Dynamic flexibility:*** In response to new information, parties could scale the safety valve price up or down, in addition to target stringency.

Stimulation of technological change

- ***Development of new technologies:*** If safety valve price is set too low, could limit incentives to innovate. Revenue from safety valve could be invested in long-term R&D.
- ***Diffusion of new and existing technologies:*** Emissions trading would provide incentives to transfer new technologies to developing countries.

Complementarity

- ***UNFCCC:*** Compatible.
- ***Kyoto:*** Safety valve could be incorporated into Kyoto structure.
- ***Established national/regional programs:*** Safeguards would be needed to ensure that availability of allowances through international safety valve does not undermine environmental effectiveness of national cap-and-trade systems without safety valves.

Flexibility for different national circumstances/strategies

- See above on target-based approach. Not affected by safety valve.

Compatibility with other national priorities

- ***Development and economic growth:*** Safety valve could help alleviate concerns that emission targets might interfere with development and economic growth.
- ***Competitiveness:*** Capping marginal costs of abatement could ease competitiveness concerns.
- ***Energy security:*** Unaffected by safety valve.
- ***Environmental co-benefits:*** Unaffected by safety valve.

Facilitation of adaptation efforts

- Revenue from safety valve could support adaptation activities.

DEVELOPMENT:
DEVELOPMENT POLICIES AND MEASURES

Countries would *commit* to broad policies supporting both climate and development objectives, and would *pledge* specific national measures to implement those policies. The goal would be to integrate climate needs into national development strategies, lowering GHG trajectories while advancing core development priorities such as energy, agriculture, and economic growth.

The broad policy commitments could focus on key sectors. Examples could include commitments to develop and implement:

- Energy sector policies and practices, such as cost-based pricing, that can improve energy efficiency, expand energy services, and reduce emissions.
- Transportation measures to reduce climate and other emissions by improving fuel economy, promoting mass transit, and expanding use of cleaner fuels.
- Agricultural policies to expand use of "no-till" practices or shift crop subsidies to support for sequestration.

Once commitments are established, countries would pledge specific national policies to fulfill them. Pledges would be listed in an international registry, and countries would report periodically on implementation and estimated emissions impacts, with their reports subject to international review. Verified emission reductions could be certified through a programmatic crediting mechanism and sold in the GHG market (assuming demand from other countries with binding emission targets).

KEY PROS AND CONS

Pros:

- Some countries may be more willing to commit to broad measures than to negotiate quantified targets.
- Focusing on key sectors such as energy and transportation can engage influential policymakers and constituencies.
- Ability to market verified reductions provides mitigation incentive.

Cons:

- Strong common policies may be hard to define given the tremendous diversity of circumstances and policy cultures among countries.
- Difficult to assess comparability of effort.
- Pledged measures likely to be highly uneven.
- Implementation uncertain without adequate resources.

ASSESSMENT

Environmental effectiveness

- ***Stringency of emission reductions:*** Left to the discretion of individual countries. Countries may be reluctant to pledge strong measures because comparability of effort cannot be ensured.
- ***Predictability of emission reductions:*** In general, emissions reductions from policies and measures less certain than from quantified targets.
- ***Comprehensiveness:*** Depends on nature of commitments, but less comprehensive than economy-wide approach.
- ***Avoidance of emission leakage:*** Strength of pledges and implementation could vary considerably, encouraging leakage.
- ***Implementation/enforceability:*** Countries may need ongoing technical assistance to develop and implement effective pledges/policies. Crediting of emission reductions provides implementation incentive. Periodic review of pledged measures highlights implementation gaps and can facilitate improvements.

Economic feasibility

- ***Cost:*** Countries will pledge only measures whose costs they are willing to bear. Crediting of emission reductions can generate revenue for countries with low-cost reductions.
- ***Cost predictability:*** Depends on specific national measures.
- ***Cost-effectiveness:*** Depends on specific national measures. Integrating emissions reduction into development planning can promote cost synergies and avoid more costly emission-reduction efforts later. Marketing of emission credits promotes cost-effectiveness of global effort.

Equity/fairness

- Flexibility of pledging allows a country to set a level of effort in accordance with its capacity, but not necessarily with its "responsibility" for climate change.
- No assurance of comparability of effort.

Breadth of participation

- Developing countries may be more willing to join an approach that places a high priority on development and does not cap emissions
- Some developed countries may object that non-quantified commitments are likely to be weak and are not enforceable.
- Focusing on development priorities such as energy and transportation can engage influential policymakers and constituencies normally outside the climate debate.

Robustness over time

- ***Long-term focus:*** Could help initiate stronger action by developing countries and, if coupled with some form of graduation mechanism, lead to stronger mitigation commitments in the future.
- ***Dynamic flexibility:*** Countries have latitude to adjust policies as they see fit.

Stimulation of technological change

- ***Development of new technologies:*** Little incentive for long-term R&D.
- ***Diffusion of new and existing technologies:*** Could provide strong incentive for transfer of available and emerging technologies to developing countries.

Complementarity

- ***UNFCCC:*** Convention states that "policies and measures to protect the climate system…should be integrated with national development programmes…" Would be consistent with general obligations of Parties under the Convention.
- ***Kyoto Protocol:*** Kyoto contemplates that countries will use policies and measures to meet their commitments, but casts commitments as quantified targets, not broad policies.
- ***Established national/regional programs:*** Promotes integration of climate commitments with national development strategies.

Flexibility for different national circumstances/strategies

- Each country would determine its own measures and level of effort

Compatibility with other national priorities

- ***Development and economic growth:*** Emphasizes climate action consistent with development objectives. Less likely than an emissions target to be seen as a constraint on growth.
- ***Competitiveness:*** Countries may make weak pledges to avoid competitive disadvantage.
- ***Energy security:*** Can be addressed in energy-focused measure.
- ***Environmental co-benefits:*** Can help identify and achieve a wide range of co-benefits.

Facilitation of adaptation efforts

- A development focus may help identify complementarities between mitigation and adaptation.

DEVELOPMENT: PROGRAMMATIC CREDITING MECHANISM

To promote private investment in climate-friendly development, countries could modify the Clean Development Mechanism or establish a new mechanism to certify GHG credits on a "programmatic" rather than a project basis. A programmatic approach would enable developing countries to receive credit for the mitigation benefits of broad policies and measures, even those not necessarily undertaken for climate reasons. The mechanism could be expressly linked to the development policies and measures approach described above to facilitate crediting of reductions achieved under pledged national measures. Alternatively, or in addition, it could certify reductions resulting from a broad range of government or private efforts not linked to commitments. Qualifying efforts could be sectoral (e.g. electricity, transport), territorial (cities, states, or regions), or undertaken by some combination of public and private actors.

Methods for quantifying emission reductions and certifying credits would have to be established. Key issues such as baselines (measured or projected emission levels, against which reductions would be calculated) and "additionality" (whether the claimed reduction is additional to what would otherwise be achieved) would be addressed in broad guidelines, whose application would require consideration of the specifics of each case.

KEY PROS AND CONS

Pros:

- Investment can be motivated, and reduction opportunities realized, on a broader scale than with a projects-based approach.
- Over the long term, the international carbon credit market may be a stronger and more stable source of support for clean development than official development assistance.
- Transaction costs may be lower than with a projects-based approach.

Cons:

- Issues of "additionality" may be even more difficult as the stakes are higher.
- Many developing countries lack reliable emission inventories, projections and GHG accounting systems.

ASSESSMENT

Environmental effectiveness

- ***Stringency of emission reductions:*** Provides incentive for stronger mitigation efforts in developing countries, but demand for GHG credits would be driven largely by the stringency of developed country commitments.
- ***Predictability of emission reductions:*** In-country reductions depend on strength of demand for credits, but overall mitigation level is unaffected.
- ***Comprehensiveness:*** Programmatic approach promotes reductions on a broader scale than project-based approach. Mechanism could certify any activity achieving a net

mitigation benefit, but likely would be targeted to sectors with largest and lowest-cost reduction opportunities (i.e., energy and land use).

- ***Avoidance of emission leakage:*** Cross-sector leakage within a country would need to be addressed in certification process, and leakage across countries is difficult to control.
- ***Implementation/enforceability:*** Implementation requires clear guidelines; a crediting body with sufficient expertise and authority; and reliable GHG inventories, projections, and accounting systems, which many developing countries have yet to establish.

Economic feasibility

- ***Cost:*** Host countries receive revenue from sale of credits. Transaction costs could be lower than with a projects-based approach.
- ***Cost predictability:*** Incentives for developing country action would depend on predictability of both program costs and future price of carbon credits.
- ***Cost-effectiveness:*** Programmatic crediting would promote wider range of low-cost developing country actions than project-based approach. Access to low-cost reductions helps developed countries achieve targets cost-effectively.

Equity/fairness

- Facilitates mitigation in developing countries without compromising development objectives or requiring binding commitments.

Breadth of participation

- Potential for larger-scale crediting could draw broader participation from both developed and developing countries and from the private sector.
- Experience and learning could facilitate stronger mitigation efforts in the future.

Robustness over time

- ***Long-term focus:*** None.
- ***Dynamic flexibility:*** Fluctuations in GHG market may make it difficult to generate and sustain steady investment flows support broad-scale emissions-reducing activities.

Stimulation of technological change

- ***Development of new technologies:*** Little incentive for long-term R&D.
- ***Diffusion of new and existing technologies:*** Could create strong incentive for technology transfer for developing countries.

Complementarity

- ***UNFCCC:*** Compatible.
- ***Kyoto Protocol:*** Would require fundamental redesign of present CDM.
- ***Established national/regional programs:*** Qualifying efforts could be tailored to national/regional programs.

Flexibility for different national circumstances/strategies

- Host countries have full flexibility in design of emission-reduction policies, subject to guidelines of crediting body.

Compatibility with other national priorities

- ***Development and economic growth:*** Could mobilize significant private investment in support of developing country priorities.
- ***Competitiveness:***
- ***Energy security:*** Would provide extra incentive for policies that countries might otherwise want to take for energy security reasons.
- ***Environmental co-benefits:*** Would provide extra incentive for policies with co-benefits such as reduced air pollution and land conservation.

Facilitation of adaptation efforts

- A levy on CDM transactions supports the Adaptation Fund under the Kyoto Protocol. A higher volume of emission reductions would increase flows to the fund.

DEVELOPMENT: "SEED" BANK FOR LEAST DEVELOPED COUNTRIES

Working through the multilateral development banks (MDBs), donor countries would support establishing, in least developed countries, "seed" banks – national public financial institutions with the objective to promoting sustainable development. The banks could leverage resources to support climate-specific activities, facilitate technology transfer and capacity building for both mitigation and adaptation. The MDBs would provide general guidance, but lending decisions would be made by the individual seed banks and funding priority would go to in-country institutions.

KEY PROS AND CONS

Pros:

- Commitment of new assistance may be a necessary ingredient in a future agreement.
- Country-level decision-making can encourage greater receptivity toward climate action and help ensure appropriate technology choices.
- Favoring in-country institutions builds stronger capacity for future efforts.

Cons:

- Donor countries may be reluctant to commit new assistance without some pledge or commitment by some developing countries.
- Existing in-country capacity to organize and manage effective seed banks may be very limited.
- Without adequate oversight, country-level efforts may be highly uneven.
- Little opportunity for significant climate mitigation in least developed countries.

ASSESSMENT

Environmental effectiveness

- ***Stringency of emission reduction:*** Lending criteria could include support of emission reduction projects.
- ***Predictability of emission reduction:*** N/A
- ***Comprehensiveness:*** N/A
- ***Avoidance of emission leakage:*** N/A
- ***Implementation/enforceability:*** N/A

Economic Feasibility

- ***Cost:*** Limited to amount donor countries/multilateral development banks willing to commit.
- ***Cost predictability:*** N/A
- ***Cost-effectiveness:*** Integrating climate objective into development can promote cost synergies and improve cost effectiveness of funding for development.

Equity/Fairness

- Meets development needs of the least developed countries and provides support for their action in reducing vulnerability

Breadth of participation

- Could involve all donor countries and least developed countries.

Robustness over time

- ***Long-term focus:*** Mainstreams climate action into countries' long-term development planning.
- ***Dynamic flexibility:*** Countries have flexibility to mobilize resources to where need is greatest.

Stimulation of technology change

- ***Development of new technologies:*** N/A
- ***Diffusion of new and existing technologies:*** Facilitates and finances transfer of climate-friendly and locally suitable technologies to the least developed countries

Complementarity

- ***UNFCCC:*** Consistent with general obligations of developed countries in support of least developed countries.
- ***Kyoto Protocol:*** Compatible
- ***Established national programmes:*** Funding is allocated in accordance with national circumstances and development priorities.

Flexibility for different national circumstances/strategies

- Provides countries flexibility to channel resources in accordance with national priorities.

Compatibility with other national priorities

- ***Development and economic growth:*** Contributes to sustainable development
- Competitiveness: N/A
- ***Energy security:*** Development of domestic clean energy sources could reduce reliance on energy imports.
- ***Environmental co-benefits:*** Can help achieve a wide range of co-benefits

Facilitation of adaptation efforts

- Can mobilize multiple resources to support national adaptation strategies and action.

SECTORAL: ELECTRICITY

Countries would negotiate intensity-based greenhouse gas targets (GHG/MWh) for the electricity sector. Targets would be differentiated among countries to reflect national circumstance, and could be binding or no-lose. Targets would be calculated on a net basis (allowing credit for carbon capture and storage). Trading could take place within the sector or with other sectoral, national, or multilateral trading systems.

KEY PROS AND CONS

Pros:

- Energy-sector emissions more reliably monitored and forecast than economy-wide emissions, particularly in developing countries.
- Intensity targets provide greater cost certainty than absolute targets.

Cons:

- Wide disparities in national energy mixes and intensity levels make negotiation of equitable targets difficult.
- Intensity targets provide less environmental certainty than absolute targets.
- Intensity targets provide little incentive for demand-side reductions.
- Intensity targets make emissions trading more complicated.

ASSESSMENT

Environmental effectiveness

- ***Stringency of emission reductions:*** Depends on targets.
- ***Predictability of emission reductions:*** Unpredictable, since emissions levels would depend on rates of economic growth and energy demand. Permanence of reductions through carbon capture and storage uncertain.
- ***Comprehensiveness:*** Electricity (and heat) sector accounts for largest share (22 percent) of global GHG emissions.
- ***Avoidance of emission leakage:*** Leakage from electricity to other sectors may be difficult to control. Applying standard to electricity sales, not generation, should avoid international leakage within the electricity sector where grid allows cross-border sales. Higher electricity costs could contribute to relocation of energy-intensive industries to non-participating countries.
- ***Implementation/enforceability:*** Emissions can be easily monitored nationally. Intensity targets are not as easily translated as absolute targets into company or facility limits.

Economic feasibility

- ***Cost:*** Depends on stringency of targets and pace of technology change.
- ***Cost predictability:*** Costs more predictable than with absolute targets because total emissions can fluctuate with level of energy production.

- ***Cost-effectiveness:*** Single-sector focus likely less cost-effective than economy-wide approach. Intensity targets may be less cost-effective than absolute targets in achieving a given level of reduction because there is limited incentive to reduce demand so mitigation must be achieved predominantly in generation.

Equity/fairness

- Targets can be differentiated based on ability to pay, historic emissions, national circumstances, or other equity criteria.

Breadth of participation

- Fifteen countries account for approximately 80 percent of global GHG emissions from electricity.

Robustness over time

- ***Long-term focus:*** Could be coupled with a long-term sectoral target (e.g., zero net emissions by 2065).
- ***Dynamic flexibility:*** Stringency of targets in successive commitment periods can reflect new science, cost, and technological data.

Stimulation of technological change

- ***Development of new technologies:*** Stringent or longer-term targets could provide significant incentive for long-term options such as capture and storage.
- ***Diffusion of new and existing technologies:*** Provides incentive for deployment and transfer of available and emerging clean energy technologies.

Complementarity

- ***UNFCCC:*** Compatible.
- ***Kyoto Protocol:*** Protocol would need to be modified to allow sectoral or intensity targets.
- ***Established national/regional programs:*** Could link to regional, national, or sub-national trading systems.

Flexibility for different national circumstances/strategies

- Differentiation could take into account wide disparities in resource base, energy mix, economic profiles, and present intensity levels.

Compatibility with other national priorities

- ***Development and economic growth:*** Intensity targets less likely than absolute targets to constrain economic growth because effective target level rises and falls with GDP.
- ***Competitiveness:*** Without broad participation, energy-intensive industries in participating countries would be at competitive disadvantage if costs proved high.
- ***Energy security:*** Depends on individual country's supply options.
- ***Environmental co-benefits:*** Could significantly reduce other electricity-related emissions.

Facilitation of adaptation efforts

- N/A

SECTORAL: AUTOMOTIVE

Countries with major shares of the global automotive market would commit to harmonized standards for fuel economy or vehicle emissions (CO_2 per mile/km). Countries could set an initial standard and periodically revise it, or could at the outset adopt a long-term schedule of standards. The agreement could be linked to emissions trading: countries or companies that perform better than the standards could earn and sell emission credits.

The standards could be negotiated with major auto manufacturers; or governments could allow companies a specified time to act voluntarily before adopting mandatory standards.

KEY PROS AND CONS

Pros:

- Addresses fastest-growing source of GHG emissions in many countries.
- Strong ancillary benefits of reduced vehicle pollution and improved energy security.

Cons:

- Emissions impact uncertain, since would not regulate the number of cars sold or miles traveled.
- Common standards may be difficult to negotiate given disparities among existing national standards and markets.

ASSESSMENT

Environmental effectiveness

- ***Stringency of emission reductions:*** Depends on standards and breadth of participation. ***Predictability of emission reductions:*** Unpredictable, since total emissions level depends on vehicle sales and usage.
- ***Comprehensiveness:*** Participation of 15 countries covers three-fourths of global CO_2 from road transport. Spillover/tipping effects could effectively extend the standards globally.
- ***Avoidance of emission leakage:*** Standards would have to encompass fuel chain to avoid leakage from transportation to fuels (i.e., cars powered by hydrogen from fossil fuels). Applying standards in country of sale, not production, should avoid leakage of manufacturing emissions.
- ***Implementation/enforceability:*** Standards easily enforced at national level. Implementation would be easier for manufacturers if standard types and methodologies (i.e., fleet average vs. weight-based classifications) are uniform for all participating countries.

Economic feasibility

- ***Cost:*** Depends on stringency of standards and pace of technology. If standard is uniform across countries, costs will be higher in countries with higher emissions/vehicle.

- ***Cost predictability:*** Cost is reasonably predictable if standards can be met with existing technology; less so if new technology is required.
- ***Cost-effectiveness:*** Standards may be significantly less cost-effective than carbon tax or other market-based approaches.

Equity/fairness

- Standards could be uniform, or could be differentiated to allow longer phase-in for countries with higher emissions/vehicle or to reflect differences in national markets.

Breadth of participation

- Requires participation of relatively small number of countries.

Robustness over time

- ***Long-term focus:*** Could be provided by establishing long-term schedule at outset.
- ***Dynamic flexibility:*** Standards could be revised if cost or pace of technology change differ substantially from projections.

Stimulation of technological change

- ***Development of new technologies:*** Long-term schedule would provide R&D incentive.
- ***Diffusion of new and existing technologies:*** Depending on stringency of standard, could provide strong incentive for uptake of technology and further diffusion through spillover/tipping effects.

Complementarity

- ***UNFCCC*:** Compatible
- ***Kyoto Protocol:*** Consistent with Article 2 ("policies and measures"), but would require changes to Protocol to allow linkage to emissions trading.
- ***Established national/regional programs:*** Uniform standard would require modification of existing national standards, which vary by stringency and standard types/methodologies.

Flexibility for different national circumstances/strategies

- Standards could be differentiated to reflect national circumstances.
- Allowing countries to maintain different standard types/methodologies would require converting national standards to a common metric.

Compatibility with other national priorities

- ***Development and economic growth:***
- ***Competitiveness:*** Manufacturers already producing lower-emission vehicles would have a near-term competitive advantage.
- ***Energy security:*** Could significantly reduce reliance on imported oil.
- ***Environmental co-benefits:*** Could significantly reduce local air pollution, although net environmental impacts will depend on choice of fuels.

Facilitation of adaptation efforts

- N/A

SECTORAL:
LAND USE

Countries would commit to targets to increase, maintain, or slow the reduction in their terrestrial carbon stocks. Targets would take the form of percent changes (either in carbon stocks or in net emission flows associated with land use) and would be differentiated to reflect national circumstance. Targets would be based on comprehensive inventories of stocks and flows, and reviews of projected trends. New targets could be negotiated on a rolling basis or countries could agree to longer-term targets with interim milestones. Targets would be "no-lose" for developing countries – there would be no penalties if they are not met. Developed countries unable to meet their national land use targets must purchase credits or allowances from other sectors or on the international GHG market.

At the close of a commitment period, verified improvements in carbon stocks or emissions beyond a country's target would be recognized as tradable credits. Credits would be time-limited and could be banked or traded domestically or internationally. Originating countries would be liable for any credits sold, and must provide equivalent allowances or credits if stock or emission changes on which credits were based are reversed before the credits are due to expire.

KEY PROS AND CONS

Pros:

- Addressing land use, along with energy-related emissions, allows a more equitable sharing of overall effort.
- Land use may offer lower-cost mitigation opportunities than other sectors.
- Ancillary benefits include protecting or improving soils, water resources, habitat, and biodiversity; generating rural income; and promoting more sustainable agricultural and forestry practices.
- Targets based on overall stocks/flows may help avoid technical complications of distinguishing between natural and human-induced changes, and between different types of sinks-related activities (e.g., afforestation, reforestation, and avoided deforestation).
- Can closely complement adaptation efforts.

Cons:

- Many countries may lack capacity to prepare adequate inventories and projections.
- Differences over legitimacy of crediting countries for naturally increasing stocks and declining emissions will complicate target-setting.

ASSESSMENT

Environmental effectiveness

- ***Stringency of emission reductions:*** Depends on targets and implementation. Availability of land-use credits may allow countries to take on stronger targets in other sectors.

- ***Predictability of emission reductions:*** Effectiveness of reduction measures may be less predictable than in other sectors. No-lose targets for developing countries make reductions uncertain.
- ***Comprehensiveness:*** While addressing only land use, this sector may account for as much as a third of global GHG emissions.
- ***Avoidance of emission leakage:*** Sector-wide approach controls leakage better than project-based approaches.
- ***Implementation/enforceability:*** Preparing adequate inventories and projections may be challenging for some countries.

Economic feasibility

- ***Cost:*** Emission reductions in land use may be less costly than many options in other sectors. Marketing of credits can provide significant revenues to countries able to significantly increase stocks or reduce emissions.
- ***Cost predictability:*** Unforeseen fluctuations in carbon stocks could pose unanticipated costs, particularly for developing countries. Availability of verified land-use credits could strengthen cost predictability for other sectors.
- ***Cost effectiveness:*** If comparatively low-cost, land-based strategies would contribute to cost-effectiveness of overall mitigation effort.

Equity / fairness

- Targets can be differentiated, including no-lose target.
- Inclusion of land use ensures that countries with large land-use emissions share equitably in overall mitigation effort.

Breadth of participation

- Ability to market credits to other sectors may encourage participation by both developed and developing countries with potential to improve stocks or reduce emissions.
- No-lose targets also could encourage developing country participation.

Robustness over time

- ***Long-term focus:*** Long-term capacity of terrestrial systems to hold carbon is uncertain, so land use strategies may play only a transitional role in long-term emission reduction.
- ***Dynamic flexibility:*** Rolling targets allow adjustments and flexibility over time.

Stimulation of technological change

- ***Development of new technologies:*** May provide some incentive.
- ***Diffusion of new and existing technologies:*** Could promote transfer of technologies and practices well suited to developing country circumstances.

Complementarity

- ***UNFCCC:*** Fully compatible; land use inventories are envisioned in the UNFCCC.
- ***Kyoto Protocol:*** Not compatible with current provisions; the Kyoto Protocol takes a segmented (each type of land use or land use change is treated individually) and project-based approach to land use.

- ***Established national/regional programs:*** Not assessed.

Flexibility for different national circumstances/strategies

- Targets can be differentiated to reflect differences in national circumstance.

Compatibility with other national priorities

- ***Development and economic growth:*** Highly compatible with developing country goals to improve food, water and rural income supply. Could promote, and generate investment in, more sustainable patterns and practices in forestry and agriculture.
- ***Competitiveness:*** Unknown
- ***Energy security:*** If managed sustainably, increased production of biomass could allow substitution of renewable energy for imported fuels.
- ***Environmental co-benefits:*** Preserving and enhancing terrestrial carbon stocks frequently provides multiple environmental benefits, including improved water quality and availability, habitat and soil retention and fertility.

Facilitation of adaptation efforts

- Strong synergies between carbon stock preservation and enhancement strategies and adaptation needs such as improved microclimate, soil fertility and stability, and water availability.

TECHNOLOGY: COORDINATED LONG-TERM R&D

Countries, through a new or existing body, would coordinate multiple initiatives to research and develop breakthrough technologies with the potential to dramatically shift long-term GHG trends. Targeted technologies could include hydrogen, fuel cells, nuclear fusion, large-scale solar-based generation, biomass fuels, or carbon capture-and-storage. The effort could be undertaken within or outside the UNFCCC, by governments alone, or with private sector partners. It could coordinate existing initiatives and be the vehicle for launching and funding new R&D efforts. Countries could negotiate long-term technology goals, interim milestones, and funding commitments. Resulting technologies would be available to all participating governments under agreed commercial licensing terms.

KEY PROS AND CONS

Pros:

- Long-term focus can encourage technologies with long investment horizons that are not likely to be driven by near- or medium-term emission limits.
- Could generate technology options that substantially lower the projected costs of long-term emissions reduction, making strong mitigation efforts more politically viable.
- Coordination among initiatives can target pooled resources to most promising technologies and reduce duplication of effort.
- Government support could leverage private investment.

Cons:

- Even if successful technologies emerge, large-scale deployment is unlikely without complementary standards and/or price signals.
- Focus on breakthrough technologies may reduce incentives for available "no-regrets" and low-cost options and undermine emerging technologies closer to being cost-competitive.
- Given competitiveness concerns, commercial licensing terms could be extremely difficult to negotiate.
- Private sector may have little incentive to invest if resulting technologies will be widely shared.

ASSESSMENT

Environmental effectiveness

- ***Stringency of emission reductions:*** No reductions required.
- ***Predictability of emission reductions:*** Impact on long-term emissions highly uncertain.
- ***Comprehensiveness:*** Could coordinate initiatives across broad range of climate-related technology challenges.
- ***Avoidance of emission leakage:*** N/A
- ***Implementation/enforceability:*** Coordination of existing initiatives may meet significant institutional resistance.

Economic feasibility

- ***Cost:*** Determined by participating countries.
- ***Cost predictability:*** Fixed by funding commitments.
- ***Cost-effectiveness:*** Could significantly enhance the cost-effectiveness of long-term mitigation effort. However, strong, sustained price signal may generate new technologies more cost-effectively than government support.

Equity/fairness

- Resulting technologies could be made available on concessional terms to developing countries.
- Technology challenges specific to poorer countries may not be addressed if research agenda set by funding countries.

Breadth of participation

- Countries may "free-ride" – choose not to participate on the expectation that resulting technologies will become globally available.
- Broader participation if countries can choose to support specific initiatives, not necessarily all.

Robustness over time

- ***Long-term focus:*** Long-term technology targets can focus and drive research.
- ***Dynamic flexibility:*** Research priorities can be shifted, but there is inherent risk of over-investing in technology paths that ultimately prove unviable.

Stimulation of technological change

- ***Development of new technologies:*** Provides stronger basis than near-term measures for development of long-term technology options.
- ***Diffusion of new and existing technologies:*** Unless resulting technologies have clear market advantage, deployment will need to be driven by targets and/or standards.

Complementarity

- ***UNFCCC:*** Compatible.
- ***Kyoto Protocol:*** Compatible.
- ***Established national/regional programs:*** Could integrate existing national and multilateral technology initiatives.

Flexibility for different national circumstances/strategies

- Research would likely focus on technology challenges common to participating countries.

Compatibility with other national priorities

- ***Development and economic growth:*** Long-term payoff in sustainable technologies and new growth opportunities could be substantial.
- ***Competitiveness:*** Competitiveness concerns make negotiation of licensing terms difficult, and could discourage countries from participating.

- ***Energy security:*** Low-carbon technologies would reduce reliance on energy imports.
- ***Environmental co-benefits:*** Could be significant, depending on technologies.

Facilitation of adaptation efforts

- N/A

BOTTOM-UP: INTERNATIONAL PLEDGE AND REVIEW

At an international pledging conference, countries (or industries) would unilaterally pledge climate change measures of their own choosing. Pledges would be listed in an international registry and could take virtually any form, including an emissions target, a carbon tax, efficiency standards, financial or technology transfers, investments in R&D, adaptation measures, or cooperative arrangements with other states.Pledges would include a projection of their expected effect on emissions, and countries would report on a periodic basis as to how actual emission reductions compared to the projected reductions.An international mechanism would be established to review the national pledges and reports.

KEY PROS AND CONS

Pros:

- Each country would determine for itself what measures it was willing and able to implement, based on its national circumstances and other national priorities
- The regime could develop in an organic, incremental way, as countries experiment with different approaches and become willing to do more.

Cons:

- Countries might be reluctant to undertake and implement significant climate change action, in the absence of multilaterally-agreed commitments, which provide some assurance that others will act as well.

ASSESSMENT

Environmental Effectiveness

- ***Stringency of emission reductions:*** While a pledging conference would put political pressure on states to put forward credible climate measures, without assurances of comparable efforts by others, pledges are not likely to entail significant emission reductions.
- ***Predictability of emission reductions:*** The total emission reductions pledged would be purely ad hoc, rather than the product of a collective decision.
- ***Comprehensiveness:*** No assurance of comprehensiveness; would depend on nature of national pledges.
- ***Avoidance of emission leakage:*** The lack of uniform emission reduction commitments would encourage leakage from countries that make strong pledges to those that do not.
- ***Enforceability:*** National pledges would not be binding. However, an effective international registry and review process would promote transparency, subject states to international scrutiny and put political pressure on them to implement their pledges
- ***Comperehensiveness:*** Not guaranteed; depends on the content of the different national pledges.

Economic feasibility

- ***Total costs:*** Countries could pledge only actions they believe are economically feasible.

- ***Cost effectiveness:*** Limited by absence of a global emissions trading system.
- ***Cost predictability:*** Depending on type of pledge, costs might be more or less predictable.

Equity/Fairness

- Equity concerns likely, unless review process involves mechanism for comparing national pledges.

Breadth of participation

- Broad participation likely, since each country would be able to define their own pledges, and would face few disincentives to participate.

Robustness over time

- ***Long-term focus:*** None
- ***Dynamic flexibility:*** The regime could develop in an organic, incremental way, as countries experiment with different approaches and become willing to do more.

Stimulation of technological change

- ***Development of new technologies:*** No international action, but individual national pledges could concern R&D.
- ***Diffusion of new and existing technologies:*** Individual national pledges could address this issue.

Complementarity

- ***UNFCCC:*** Continuity with reporting and review system of UNFCCC.
- ***Kyoto Protocol:*** Significant departure from Kyoto's focus on internationally-negotiated targets and timetables.
- ***Established national/regional programs:*** National pledges could incorporate existing national and regional programs.

Flexibility for different national circumstances/strategies

- Each country would determine for itself what measures it was willing and able to implement, based on its national circumstances and other national priorities.

Compatibility with other national priorities

- ***Development and economic growth:*** Could be addressed in development of national pledges.
- ***Competitiveness:*** Competitiveness concerns might make countries less willing to pledge significant action.
- ***Energy security:*** Could be addressed in development of national pledges.
- ***Environmental co-benefits:*** Could be addressed in development of national pledges.

Facilitation of adaptation efforts

- Pledges could involve adaptation measures.

STRAWMAN ELEMENT: BOTTOM UP LINKED EMISSIONS TRADING

National and/or regional emissions trading systems would be linked through mutual recognition of emission allowances. Each country would retain control over the stringency, form, and scope of its national target, the allocation of that target among its domestic emitters, and domestic implementation and enforcement. A country's ability to link would depend on whether other countries viewed its target and compliance system as adequate. "Gateways" could allow trading between countries with different target types (intensity targets, safety valve, etc.).

The trading system could be administered directly by the participating states, or the UNFCCC or another intergovernmental body could serve a facilitating role – for example, by establishing and maintaining an international registry and by providing reporting and review functions. The linked system could evolve over time into a fully integrated international emissions trading system.

KEY PROS AND CONS

Pros:

- Countries would have flexibility to adopt different types and levels of targets.
- Broadening and linking existing and future trading systems would promote cost-effectiveness.
- Membership could be limited to those with adequate implementation and compliance systems.

Cons:

- Countries might be reluctant to accept strong national targets, in the absence of an assurance that other states will participate.
- Systems with very different price levels may be reluctant to link.

ASSESSMENT

Environmental Effectiveness

- ***Stringency of emission reductions:*** Emissions reductions might be limited initially, since countries might be reluctant to accept strong targets in the absence of an assurance that other states will reduce emissions significantly.
- ***Predictability of emission reductions:*** Emissions reductions unpredictable, since dependent on nationally-established targets.
- ***Comprehensiveness:*** No assurance of comprehensiveness.
- ***Avoidance of emission leakage:*** Leakage likely from countries with national targets to those without targets.
- ***Enforceability:*** Limiting participation to countries with adequate domestic enforcement measures could help ensure that trading does not undermine environmental effectiveness.

Economic feasibility

- ***Total costs:*** Countries could set national targets so as to keep expected total costs to an acceptable level.
- ***Cost effectiveness:*** International trading would promote cost-effectiveness and alleviate competitiveness concerns.
- ***Cost predictability:*** Countries could adopt intensity targets, or include a safety valve, in order to enhance cost predictability.

Equity/Fairness

- Comparability of effort must be assessed on case-by-case basis, rather than through a multilateral negotiation.

Breadth of participation

- Countries that object to international targets on sovereignty grounds may be more willing to adopt nationally defined targets.
- Countries that object to any form of targets approach will not participate.

Robustness over time

- ***Long-term focus:*** None.
- ***Dynamic flexibility:*** Multiple trading systems allow experimentation that can inform subsequent design of global trading system.

Stimulation of technological change

- ***Development of new technologies:*** Indirect incentives in countries with ambitious targets.
- ***Diffusion of new and existing technologies:*** Emissions trading provides incentive for diffusion of technology.

Complementarity

- ***UNFCCC:*** Linked national trading programs compatible with UNFCCC, which promotes national action and international cooperation.
- ***Kyoto Protocol/Other MEAs:*** Kyoto Protocol would need to be amended, to allow trading between Kyoto and non-Kyoto countries.
- ***Established national/regional programs:*** Builds on established national emission trading programs.

Flexibility for different national circumstances/strategies

- Countries would have flexibility to adopt different types and levels of targets, and different reporting and compliance systems.
- Linkages between markets could be tailor-made for individual countries and sectors.

Compatibility with other national priorities

- ***Development and economic growth:*** National targets could be chosen so as not to limit economic growth.

- ***Competitiveness:*** National targets could focus on sectors that do not raise competitiveness concerns.
- ***Energy security:*** Depends on design of domestic systems.
- ***Environmental co-benefits:*** Depends on design of domestic systems.

Facilitation of adaptation efforts

- N/A

ADAPTATION: MAINSTREAMING

Multilateral development banks would establish new lending guidelines to routinely incorporate climate risk assessments and adaptation measures in project design, review, and approval. Proposed investments would be assessed both for their own vulnerability to climate variability and climate change, and for any broader effect on climate vulnerability in recipient countries. Projects that would substantially increase climate vulnerability would be financed only if modified to reduce risks within acceptable levels. Projects that substantially reduce climate vulnerability would receive more favorable consideration. Lenders could in addition require recipient countries to undertake broader adaptation efforts as a condition of project approval. The same assessment/approval protocols could be applied by donor countries in bilateral assistance programs, and by private lenders.

KEY PROS AND CONS

Pros:

- Would promote integration of adaptation planning and practices across full range of development strategies.
- Would discourage development projects and patterns that increase climate vulnerability.
- Could generate or leverage more resources for adaptation-related efforts than multilateral climate process would likely generate.

Cons:

- Recipient countries and development agencies may object that development flows are being diverted for purposes other than core development priorities.

ASSESSMENT

Environmental effectiveness

- ***Stringency of emission reductions:*** N/A
- ***Predictability of emission reductions:*** N/A
- ***Comprehensiveness:*** Could be scaled up over time to encompass full range of climate-sensitive development assistance.
- ***Avoidance of emission leakage:*** N/A
- ***implementation/enforceability:*** Assessment/approval protocols fully enforceable by donor countries. However, credible criteria for assessing project-level risk may be difficult to develop on basis of current science.

Economic feasibility

- ***Cost:*** Depends on project; could be significant.
- ***Cost effectiveness:*** Addressing adaptation through established development channels may be more cost-effective than establishing new adaptation programs or institutions under climate regime.
- ***Cost predictability:*** Project review process could provide full accounting of projected costs.

Equity / fairness

- Working outside the climate regime may be perceived as less directly addressing a core equity concern, perhaps diminishing prospects for a broader climate agreement with strong mitigation commitments.
- Some recipient countries will require stronger technical support to ensure equal access to development assistance.

Breadth of participation

- Could encompass all donor countries and all countries otherwise eligible for development assistance.

Robustness over time

- ***Long-term focus:*** Promotes consideration of long-term climate risks in development planning.
- ***Dynamic flexibility:*** Guidelines could be periodically revised based on experience and improved understanding of climate risks.

Stimulation of technological change

- ***Development of new technologies:*** Could provide indirect incentive for development of new risk-reduction technologies.
- ***Diffusion of new and existing technologies:*** Would support transfer of risk-reduction technologies to recipient countries.

Complementarity

- ***UNFCCC:*** Consistent with Convention's requirement that developed countries help developing countries adapt to climate change. Working outside the climate regime may be perceived as weakening the Convention process, or as success in broadening the effort.
- ***Kyoto Protocol:*** National Adaptation Programs of Action (NAPAs) developed under Protocol could inform project review/approval process.
- ***Established national/regional programs:*** Would support national efforts to mainstream adaptation, but could require recipient countries to modify development strategies.

Flexibility for different national circumstances/strategies

- Project review process would allow consideration of climate risks, and development of adaptation strategies, specific to national circumstances and priorities.

Compatibility with other national priorities

- ***Development and economic growth:*** Would promote more sustainable patterns of development, but unless accompanied by an increase in overall assistance, might be perceived as a diversion of resources from core development priorities.
- ***Competitiveness:*** N/A
- ***Energy security:*** N/A
- ***Environmental co-benefits:*** Risk-reduction efforts could have important environmental co-benefits, such as improved soil stability and water availability, coastal zone protection, and protection of other sensitive habitats.

Facilitation of adaptation efforts

- Working through established development channels could mobilize greater resources and provide greater reach than pursuing adaptation exclusively through the climate regime. However, diffusing adaptation across institutions whose core missions are not climate-related may not afford it adequate priority or target resources as directly to adaptation needs.

ADAPTATION: CLIMATE DISASTER RELIEF/INSURANCE

Governments would establish a new, or designate an existing, intergovernmental body to coordinate international climate-related disaster relief for less developed countries, and to offer subsidized climate risk insurance to middle-income developing countries. Two funds – one for relief, one for insurance – would be established and regularly funded by donor countries, with contributions shared on the basis of ability to pay, historic emissions, or other criteria.

Using the relief fund, the intergovernmental body would be the primary provider of multilateral relief to less developed countries for climate-related losses. Relief would be provided for both catastrophic and slow-onset climate losses, whether caused by climate variability or climate change, and could be coordinated with bilateral giving. Relief would address immediate humanitarian needs and reconstruction; latter would emphasize strategies to reduce future vulnerability.

Using the insurance fund, the intergovernmental body would underwrite "coverage" against climate-related risks for middle-income developing countries. Recipient countries would pay "premiums" based in part on ability to pay. Premiums would be reduced for countries that undertake proactive adaptation and/or climate change mitigation efforts. Insurance agreements could take multiple forms, including weather derivatives. Private investors could supplement government funding through instruments such as catastrophe bonds.

KEY PROS AND CONS

Pros:

- Coordinates and provides a regular funding stream for emergency climate-related disaster relief.
- Graduated premiums may provide incentive for proactive adaptation by middle-income developing countries.
- Provides a mechanism for developed country support of developing country adaptation without requiring a determination of whether losses are caused by natural climate variability or climate change.

Cons:

- Donor countries may be unwilling to commit to regular funding.
- Governments likely to resist establishment of new institution.
- Developing countries may oppose conditionality.

ASSESSMENT

Environmental effectiveness

- ***Stringency of emission reductions:*** Reduced insurance premiums may encourage some mitigation in recipient countries.
- ***Predictability of emission reductions:*** Low.

- ***Comprehensiveness:*** N/A
- ***Avoidance of emission leakage:*** N/A
- ***Implementation/enforceability:*** N/A

Economic Feasibility

- ***Cost:*** Limited to amount donor countries are willing to commit.
- ***Cost predictability***: Donor countries would pay into funds regularly, instead of on an ad hoc basis in response to specific disasters.
- ***Cost-effectiveness:*** Coordination could improve cost-effectiveness of relief funding. Monitoring of compliance would be necessary to ensure effectiveness of adaptation funding.

Equity/Fairness

- Provides developed country support of developing country adaptation efforts while avoiding assessment of "responsibility" for specific climate impacts.

Breadth of participation

- Most effective if all major donor countries participate. Some may be unwilling to contribute if relief and insurance funds require no demonstration that losses caused by climate change.
- All low-income countries would be eligible for relief.

Robustness over time

- ***Long-term focus:*** Insurance model promotes assessment of long-term risks and provides some incentive for long-term adaptation strategies. To be credible and effective, requires long-term funding commitment from donor countries.
- ***Dynamic flexibility:*** Lessons learned can improve program design.

Stimulation of technological change

- ***Development of new technologies:*** Emphasis on risk reduction could encourage new adaptation technologies and coping strategies.
- ***Diffusion of new and existing technologies:*** If effective in promoting proactive adaptation, would facilitate transfer of adaptation technologies to and among developing countries.

Flexibility for different national circumstances

- Scope and nature of insurance coverage can be tailored to national circumstances.

Compatibility with other national priorities

- ***Development and economic growth:*** Provides some protection against economic disruption from climate-related disasters and impacts. Could help discourage development patterns that increase climate vulnerability.
- ***Competitiveness:*** N/A
- ***Energy security:*** N/A

- ***Environmental co-benefits*:** If successful in stimulating proactive adaptation, could have significant environmental co-benefits, including improved soil stability, enhanced water supplies, and protection of sensitive ecosystems.

Facilitation of adaptation efforts

- Risk-reduction assistance provided to less developed countries only in response to climate disaster/impacts, rather than proactively.
- Graduated insurance premiums could promote proactive adaptation.
- Funding unlikely to match needs.