Capacity Building and a Renewable Energy Protocol to the Climate Change Convention

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Introduction

The goal of the proposed Capacity Building and Renewable Energy Protocol is to slow growth in greenhouse gas emissions while building capacity for sustainable development in the developing world. The North-South[1] divide has been one of many barriers to effective international environmental agreements. *This proposed protocol seeks to bridge that divide by treating the climate change issue in the developing world as a sustainable development issue, rather than a pollution control issue.* Developing countries have significant economic development needs, and they sometimes see environmental treaties "as an effort to sabotage their development aspirations." (Chasek, Downie, Brown, 2006: 237) In addition, the South believes the North has not followed through on commitments made in environmental treaties, particularly "new and additional financial resources, technology transfer, and capacity building." (Chasek et al., 2006: 242) This protocol seeks to make good on those commitments.

Energy use and development patterns in the North and South both contribute to climate change. The lack of participation by the developing world in the Kyoto Protocol is a significant flaw, because their rapid economic growth will have a large impact on climate in the middle and long runs.

According to projections by the International Energy Agency (IEA), "Developing countries account for over three-quarters of the increase in global CO2 emissions between 2004 and 2030. They will overtake the Organization for Economic Co-operation and Development (OECD) [2] as the biggest emitter by soon after 2010." IEA also projects that China's emissions will exceed the U.S. by 2010. (IEA: World Energy Outlook, Summary and Conclusions, 2006: 5). U.S. Energy Information Agency data anticipates that emissions from Non-OECD countries will surpass OECD countries by 2010 (see Figure 1).

Former EPA Director Christine Todd Whitman, told a forum at the Kennedy School of Government on December 5, 2006 that the international community should help developing countries "leapfrog the fossil fuel phase" as they pursue economic development. Clearly, the international community needs to find a way to bring the developing world into an international agreement on climate change that addresses the developing countries' main concern – that limiting greenhouse gas emissions will dramatically limit their ability to reduce poverty and provide solid economic development. Through the Millennium Development Goals, the world is currently embarked on a major initiative to reduce poverty and disease and increase education and environmental sustainability in the developing world. Because energy is at the foundation of efforts to reduce poverty and provide sanitary living conditions, I believe the time is ripe to create a new program that provides resources and support for renewable energy projects in these countries.

Figure 1.

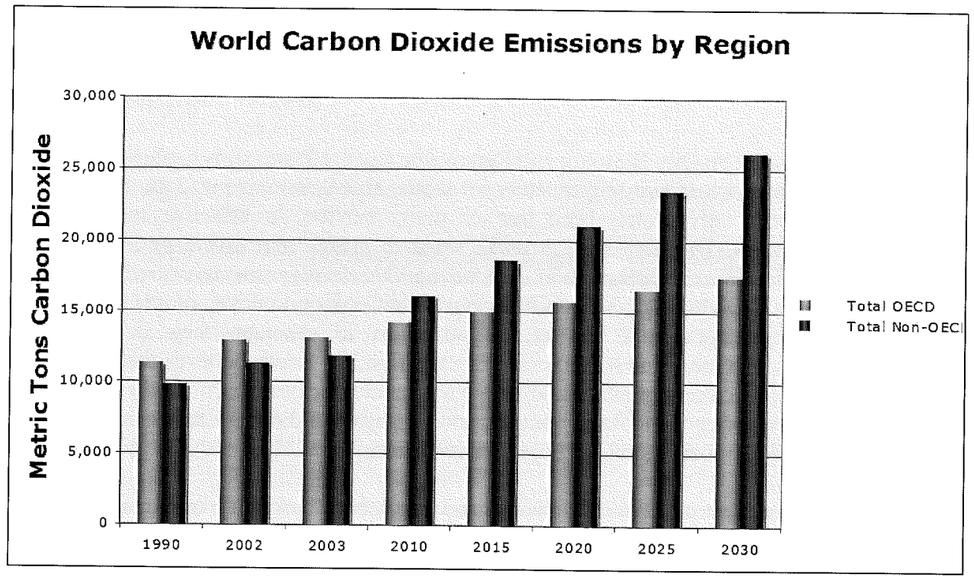

Figure 1. Sources: History: Energy Information Administration (EIA), International Energy Annual 2003 (May-July 2005), www.eia. doe.gov/iea/.
Projections: EIA, Annual Energy Outlook 2006, DOE/EIA-0383(2006) (Washington, DC, February 2006), AEO2006.
National Energy Modeling System, run AEO2006.D111905A, web site www.eia.doe.gov/oiaf/aeo/; and System for the Analysis of Global Energy Markets (2006).

Although support has been far from universal, the world community has shown significant concern about global warming and climate change issues. By 1994, 189 countries had signed the United Nations Framework on Climate Change (UNFCCC); by 2005, 165 countries and countries had ratified the Kyoto Protocol. (UNFCCC, UNFCCC Secretariat website). Like many other environmental agreements, the Climate Change Treaty called for technology transfer and other resources for developing countries:

> Article 4 paragraph 1(c) of the United Nations Framework on Climate Change (Climate Change Convention) outlines a commitment by parties to promote and cooperate in "…transfer of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases…."
>
> Article 4 paragraph 5 outlines a commitment for developed country Parties to "promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention….."
>
> Article 6(b) outlines an agreement to cooperate in "…. the development and implementation of education and training programmes, including the strengthening of national institutions

> and the exchange or secondment of personnel to train experts in this field, in particular for developing countries."

The Capacity Building and Renewable Energy Protocol proposed in this paper specifically addresses and further develops these provisions of the Climate Change Convention, and emphasizes both economic development and environmental goals. While the Kyoto Protocol led to creation of the Clean Development Mechanism (CDM)[3], which will be a very helpful tool for some developing countries, more can and should be done. This proposed protocol focuses on renewable energy technology investment; education for technicians, engineers, and policymakers in renewable energy development, technology management, and maintenance; and technical, management and organizational development training.

This protocol proposes an investment of $10 billion U.S. dollars per year for the next 10 years on renewable energy projects in the developing world. That is about one-quarter of the $41 billion/year that the World Bank estimates developing countries will need in the near term for electricity supply. (World Bank, The World Bank and Climate Change, 2006) The World Bank's renewable energy portfolio is growing (World Bank, Clean Energy and Development, 2006), but in its 60-year history, the World Bank has invested only about $8 billion in renewable energy and energy efficiency projects. (Renewable Energy and Energy Efficiency Financing and Policy Network, 2005: 21) If successful, the Capacity Building and Renewable Energy Protocol will meet the energy and development goals of local communities in the global South and build the capacity for these communities to engineer, manage, and maintain these projects for the future. The protocol can help achieve goals already identified in the developing world. For example:

- In Pakistan, increase the total electricity generation from renewable energy by 10% by 2015.
- In Brazil, increase renewable energy power generation capacity by 3300 MW by 2010.
- In Uganda, install 200 MW of renewable energy capacity by 2010. (International Conference on Renewable Energies, Content Analysis of the International Action Programme, 2005: 20)

This protocol has the potential to provide long-term economic benefits to developing countries and to prevent dramatic increases in CO2 emissions as these countries build their economies.

Technology Investment

The first component of this proposal is a commitment by developed countries to help developing countries purchase, license, and adapt the technology and infrastructure required to implement renewable energy plans. Through a new fund, grants would be available to developing countries with a) a feasible and maintainable long-term energy plan that uses environmentally sound technologies (per Article 4, paragraph 5 of the UNFCCC) for renewable energy projects, and b) an outline of policies that will support their renewable energy development plan. Grants would also be available to create such plans. Grants for nuclear power initiatives would not be allowed under this protocol.

Highest priority for technology grants would be given to countries with the least amount of electrification and rapid rates of loss of forest cover due to dependence on biomass for heating and cooking. Grantees would be encouraged to build strong relationships locally and internationally to support their projects. Potential partners could be non-profit organizations, universities, energy technology incubators, and others. To draw attention to this initiative, a new global fund would be created, called the Renewable Energy Technology Fund. This fund would be administered by the Global Environmental Facility, and would work in concert with the Clean Development Mechanism, the World Bank, and regional development banks. Coordination between the programs would be essential.

To encourage additional investment in renewable energy technology, the granting agency would also be authorized to use the Renewable Energy Technology Fund to guarantee private loans or development bank loans for renewable energy technology investment projects. OECD reports that shifting dollars toward loan guarantees can increase the overall dollars available and encourage private investment. (Reisen, 2004: 25)

Experts indicate that solving the climate change problem will require significant research and development into new energy technologies. (Jacoby, Prinn, Schmalensee, 2000: 526) The Expert Group on Technology Transfer (EGTT) suggests the need to "encourage academia and industry to develop research programs to address climate-friendly technologies and to promote investment in climate change" (Subsidiary Body for Scientific and Technological Advice, 2006). To that end, this program would also provide research and development grants for researchers in the North and South for new technologies applicable in developing country situations, or for adapting existing technologies to local needs. Preference would be given to research conducted by institutions based in developing countries or through a partnership between researchers based in the North and South. Partners who can help facilitate technology transfer, including universities and private industry, would be encouraged to do so.

So as not to burden this new Renewable Energy Technology Fund with controversy, nuclear energy projects would not be funded through the program. Serious questions remain about reactor safety, waste disposal, and creation of materials that can be used for weapons. Many in the environmental community strongly oppose the use of nuclear energy, and international organizations like the World Bank have historically steered clear of nuclear energy projects. An advisory board, outlined later in this paper, will be charged with the task of reviewing and recommending technologies to fund through the initiative.

Education

The second major component of the protocol would be an agreement by countries in the global North to create educational partnerships with countries in the South. The goals would be to educate scientists, engineers, technology experts, elected officials, and public administrators who can help develop, manage, and maintain renewable energy programs or projects in their countries, and to encourage joint research and field projects to develop and implement new renewable energy technology and projects. Developed countries would recruit universities and university-based engineers, renewable energy practitioners, elected officials, and finance and public administration experts to partner with countries, communities, technical colleges,

universities, and Centers of Excellence in the South to provide educational services, expertise, and support. Developed countries would also commit to providing incentives and financial support for these partnerships.

Educating Scientists, Engineers, Regulators, Finance Experts, Elected Officials, and Public Administrators

Specific partnerships under the protocol would be created at the request of countries in developing countries. Renewable energy education partnerships could take the following forms:

- Professors from the North engaging in visiting professorships to educational institutions in the South;
- Scholarships for students from the South to take courses or degrees at educational institutions in the North or South related to developing, managing, financing, regulating, or administering renewable energy projects;
- Assistance in setting up renewable energy-related educational programs, departments, or Centers of Excellence in the South;
- On-going North-South sister university relationships with the goal of long-term support and information sharing on renewable energy projects.

Scholarships and some expenses associated with these partnerships would be eligible for education partnerships grants.

Research and Field Projects

In addition, joint research and field projects leading to, or designing specific renewable energy projects and plans would be encouraged and eligible for support from this program. These joint projects would be based on technology needs assessments or other relevant plans developed by countries or regions in the South, so that projects are rooted in the desires and need of the local population. These projects could include ways to develop new technology, or more likely, to adapt existing technologies to local needs.

The EGTT notes that additional resources and capacity are needed for plan development as well as implementation. Therefore, potential educational partnerships would also include collaborations to design renewable energy plans, energy investment policies, intellectual property policies or technology needs assessments for a country or region.

In order to ensure that developing countries in fact benefit from scholarships for their citizens, students receiving program scholarships would be required to return to a developing country to work for a minimum number of years or be required to pay back the scholarship amount.

Training

This program would coordinate amongst the various training programs already provided on renewable energy technology – through United Nations Environment Program (UNEP), United Nations Development Program (UNDP) and others, to ensure that the training quality is high,

and that the goals of the protocol are met. Grants could be provided for instructing technicians and others charged with implementing and maintaining renewable energy projects. As the front line implementers of a renewable energy plan, their skills and knowledge are essential for success. However, training the technicians who install and maintain the equipment may not be enough. According to Warren Bennis, professor of business administration and founding chairman of the Leadership Institute at the University of Southern California's Marshall School of Business, "There's nothing worse than sending a changed person back into an unchanged organization," (per email exchange with Professor Susskind). To begin to address this problem, educational and training programs should also extend beyond practitioners to leaders of agencies, regulatory organizations, and others who will be in a position to manage staff, develop policies, and otherwise influence renewable energy projects. The focus of this grant program will be not only training skilled technicians, but also creating effective institutions where innovation and renewable energy projects will be supported and encouraged.

The international community, through the UNEP, Climate Technology Initiative (CTI) and others, has provided training workshops on technology needs assessments, technology information, financial options, and more. These appear to have met some capacity building needs. However, the EGTT reports that, "it is difficult to retain the expertise and knowledge developed over time by expert or countries' representatives who participate in workshops, seminars, or training programs organized under the UNFCCC" (Subsidiary Body for Scientific and Technological Advice, 2006: 15). This is a difficult challenge; however, one approach would be to require that training grant applications include information on how the organization applying for the grant will sustain and support newly trained and educated staff, and how the organization will ensure that training will be passed onto others in their organization and government. Continued relationships through educational partnerships may also help mitigate these problems.

Advisory Board

An advisory group made up of both donor and recipient country representatives would prioritize activities and provide overall direction for the programs associated with this Protocol. Topics that the Advisory Board would consider include:

- Better quantify the cost for renewable energy need in the developing world, and adjust fundraising goals to that need.
- Determine the percentage of funds that should be used for technology grants vs. education and training grants.
- Create funding criteria, and identify priority regions and technologies for Fund investment.
- Outline a plan for coordinating with the World Bank, regional development banks, and other sustainable development and environmental grant and loan programs.
- Identify pressing technology research projects in which the Renewable Energy Fund should invest. Ask for example, "Can the research be conducted through a North-South partnership?"
- Determine which technologies the Fund will support.
- Outline a grant/loan guarantee application process.

The Advisory Board may be charged with other research and program development work as the world community begins to implement the Capacity Building and Renewable Energy Protocol.

Funding

Providing adequate funding is a significant challenge for this proposal. One thing is clear: the amount currently available for energy development is woefully inadequate. According to a November 13, 2006 press release from the World Bank, "The Bank estimates developing countries need an annual investment for electricity supply of U.S. $165 billion through 2010, and 3% per year after that through 2030. But only half of that amount -- $80 billion – is readily identifiable. With current policies and investments, 1.4 billion people still will not have access to modern forms of energy services by 2030….." The release goes on to say that "….developing countries are expected to follow in the footsteps of industrialized nations and produce large amounts of CO2 as they develop unless new technologies are available to reduce greenhouse gas emissions." (World Bank Website: The World Bank and Climate Change)

This new protocol would seek to provide an additional $10 billion annually for renewable energy projects in the developing world through 2017, thus steering countries toward more sustainable energy practices while they develop. Fifty percent of the fund would come from country contributions, including a proposed $5 per flight tax on airfares. The rest would be raised through a combination of contributions from businesses, interest income, Global Premium bonds and educational tax credits, tuition remissions and educational loan forgives by participating countries.

I propose the following steps be taken:

- Create a new fund called the Renewable Energy Technology Fund, which would accept donations from developed countries as well as foundations, businesses, and individuals.
- Create a new International Financial Facility (perhaps paired with a Global Premium Bond) to support activities working to achieve Millennium Development Goals. The Renewable Energy Fund would be one of the beneficiaries of this model.
- Allow use of development grant dollars as public guarantees for loans.
- Seek agreement by developed countries to provide tax and tuition remission and/or educational loan forgiveness to encourage the educational partnerships outline.

Renewable Energy Technology Fund

Creation of a new trust fund called the Renewable Energy Technology Fund would bring attention to this need, and allow promotion and marketing for fundraising for this initiative. The first, and most important donations into this fund would be from developed countries; in addition, the fund would accept donations from foundations, individuals, and businesses. Global Environmental Facility (GEF) would manage the grants. About $1 billion in climate change funds now reside in the GEF (Global Environmental Facility: Meeting on the Fourth

Replenishment of the GEF Trust Fund, 2006). I would propose shifting these dollars to the Renewable Energy Technology Fund, and ask signers of the new protocol to pledge at least five times as much as their current pledges per year for the next ten years. Donor countries would be encouraged to provide multiple years of these pledged dollars up front, so that funds could be invested to earn interest on the principle.

Countries would also be challenged to levy a $5 per flight tax on airfares expressly for the purpose of increasing funds for the Renewable Energy Technology Fund. These taxes would be collected by national governments and voluntarily passed on to the Renewable Energy Technology Fund. Based on Travel Industry Association air travel volume data (U.S. Travel Market Overview, 2005), with a $5 per flight tax, the U.S. alone would contribute about $1 billion per year to the Renewable Energy Technology Fund. [4]

Focus should also be placed on securing large contributions from businesses or foundations. Fundraising for this fund might be farmed out to the Clinton Global Initiative or a similar organization. Businesses could also contribute by offsetting their airline travel and other fossil-fuel consuming activities with contributions to the Renewable Energy Technology Fund, for the specific purpose of funding qualified greenhouse gas-reducing projects in the developing world.

In September, 2006, Sir Richard Branson, President of Virgin Airlines, announced at a Clinton Global Initiative Conference that he was pledging future profits from Virgin Airlines – estimated at $3 billion over 10 years -- for renewable energy research (Oliver, 2006). Donations of this size from the corporate world to the Renewable Energy Technology Fund would lay an outstanding foundation for the program, building principle that could be invested for future use.

Websites like www.climatecare.org provide the public and business with an easy way to offset their greenhouse gas emissions through investments in renewable energy projects in the developing world. Silverjet, a UK-based airline, announced last fall that it intended to build the cost of carbon offsets into ticket prices. Silverjet customers can then choose which projects it wishes to support with the offsets. (Green Business News, 2006) If other airlines followed Silverjet's lead, billions of dollars could be raised for Renewable Energy Fund projects that directly reduce greenhouse gas emissions. Offset programs like these provide an alternative for airlines located in countries that choose not to adopt the $5 per flight tax proposed earlier in this section.

The Renewable Energy Technology Fund pool would supplement existing programs and funding mechanisms, including the Clean Development Mechanism and GEF and loan providers like the World Bank and regional development banks. The protocol would mandate creation of a plan for coordinating these various funding mechanisms for the purposes of this protocol.

A paper by Helmut Reisen for the OECD Development Centre proposes creating an International Financial Facility to increase and accelerate dollars available for achieving Millennium Development Goals. While the Global Fund to Fight AIDS, Tuberculosis and Malaria has raised billions of dollars, funding for other goals has been thin, making achievement of the Millennium Development Goals (MDGs) by 2015 difficult. Reisen reviews a number of proposals including global taxes, increased private donations, new financial tools and more. He

notes "pessimism" about the feasibility of global taxes, and highlights an observation that the "U.S. Congress has passed legislation that makes it illegal for the United States to participate in any global taxes." (Reisen, 2004:11) Three non-global tax ideas in his proposal are: sale of bonds based on pledges made by donor countries, sale of Global Premium Bonds, and creation of public guarantees to back lending for infrastructure. (Reisen, 2004)

International Financial Facility (IFF)

The International Financial Facility has been proposed by the United Kingdom Department for International Development (DFID). The basis for the facility is pledges made by donor countries. Donors have made pledges to achieve the Millennium Development Goals (MDG), but those pledges will be realized only over time. Additional pledges may be made to the Renewable Energy Technology Fund. My modified version of Reisen's proposal would hold countries to both MDG and Renewable Energy Technology Fund pledges, and "On the back of these pledges… IFF would issue bonds in its own name…The IFF would serve the function of a temporary finance facility; it would be replenished at regular intervals, and at each replenishment, donors would make a fresh series of annual long-term funding pledges….as the basis for further borrowing." (Reisen, 2004: 22) The IFF would transfer these dollars to existing programs for disbursement to developing countries. (Reisen, 2004: 23) Reisen points out that a problem with this proposal could be whether, in some countries, a current government or Administration can bind a future government to its financial commitments. If this International Financial Facility is created, the Renewable Energy Fund could be a recipient of the proceeds.

An alternative to this proposal would be asking donor countries to donate larger sums into "trust funds" which can be invested; these trust funds could earn dollars and would be spent over a period of time for the goals of the programs.

Global Premium Bonds

This bond program is based on active programs in the UK and other countries. "A premium bond is like a lottery ticket in that the return depends on a random prize draw, but otherwise it is a bond, hence a savings instrument where the capital is not at risk. Annual premium bond sales are presently running at $34 B in the United Kingdom." (Reisen, 2004: 18) These global premium bonds could be issued in association with the IFF proposal outline above. These bonds could have appeal based on an increasing interest in socially responsible investment. (Reisen, 2004: 18)

Public Guarantees

Some experts in the development community argue that in some instances, it is better for development aid to serve as a guarantee for private investment, rather than as a provider of grant dollars. According to Reisen "availability of aid can 'crowd out' commercial lending and discourage …. authorities from becoming more financially self-sustaining." (Reisen, 2004: 25) In cases where there are viable and affordable commercial lending options, using the dollars instead as a guarantee can add more dollars to the scenario and encourages private investment.

Allowing use of Renewable Energy Technology Fund dollars to be used in this way would help leverage other dollars into renewable energy projects.

Tax incentives and educational support

Under the protocol, developed countries would agree to provide colleges and universities in their countries with incentives for North-South renewable energy education partnerships through their respective countries' tax code and through tuition remission and loan forgiveness programs. These programs would reward graduate school students who, upon graduation, spend a year in an eligible country supporting an approved renewable energy project or partnering with a university in the developing world conducting field research on renewable energy research and development projects. Developed countries would also agree to use the bully pulpit to build these relationships, and to encourage colleges and universities to absorb the staff costs for these partnerships into university budgets.

Why Education and Technology Investment Focused on the Developing World?

Providing significant resources to the developing world for investment in renewable energy technology -- including research and development for technology suited to the developing world and education, planning support and training, will help solve the world's climate change problem. It will also help developing countries grow economically.

This paper is focused on economic development because poverty is the most important issue facing the developing world today, and energy is a major foundation for development. If you take this approach, then technology investment and education become logical foci. According to an OECD Development Centre report called *Human Capital Formation and Foreign Direct Investment in Developing Countries,* " Human resource development (HRD) and foreign direct investment (FDI) are among the key drivers of growth in developed and developing countries." (Miyamoto, 2003: 9) The paper also reports that "Other essential fundamentals include: i) sound policy and an attractive investment climate; ii) co-ordination between formal education and training policies; iii) collaboration among all stakeholders of human resource development including host government, investment promotion agency (IPA), multinational enterprises (MNEs), and educational institutions; and iv) identification of the type of MNEs that would benefit host countries the most in terms of human capital development and technology transfer." (Miyamoto, 2003: 6) I address many of these issues in this proposal for a new protocol.

Countries from the South have identified lack of expertise and financial resources as major barriers to adopting renewable energy. The top priority listed in "Sustainable Energy: A Framework for New and Renewable Energy in Southern Africa," is Research and Development in Renewable Energy. The report says "Research is cardinal to the development of appropriate RETs (Renewable Energy Technologies) and SADC (Southern Africa Development Community) member states should support efforts by professionals to develop and commercialize advanced renewable energy technologies that can serve as cost-effective and environmentally friendly alternatives to conventional energy. Consequently, *there is a need for member States to increase access and enrolment of their nationals into technical/research*

institutions and colleges providing training in RETs development (emphasis added)." (Economic Commission for Africa, 2006: 33)

The SADC report emphasizes the need for expertise to be local. "In order to develop a sustainable energy strategy, a country needs its own cadre of professionals who understand both the elements of sustainable energy and the country's unique situation." (Economic Commission for Africa, 2006: 35) It also points out that donor-driven projects "last for as long as donor funds are available. In most instances, the projects do not include capacity building components to transfer the skills to locals in a sustainable manner." (Economic Commission for Africa, 2006: 29)

The report also highlights a strong rationale for investment in capital expenses. "High initial capital cost" and "lack of funds to expand rural electrification programmes" are identified as two barriers to success. (Economic Commission for Africa, 2006: 22 and 23)

Policy Recommendations coming out of the 2004 International Conference on Renewable Energies highlighted the need for well-trained workforces in technology, business, and regulatory systems, and pointed to important roles for universities and research institutions in meeting that need. (International Conference for Renewable Energies, Policy Recommendations, 2005: 9, 19)

As mentioned earlier, many developing countries are not yet ready to benefit from innovative financial tools like the Clean Development Mechanism (CDM). The Expert Group on Technology Transfer reports that about 25 countries have embarked on technology needs assessments, but that in many cases the plans are not specific enough to draw partners or funders. (Subsidiary Body for Scientific and Technological Advice, 2006: 9, 16) This protocol will provide dollars to build the capacity in developing countries so they can draw foreign investment into their countries through mechanisms like CDM. Grants will provide dollars for more realistic and sound energy policies and investment plans and will train and educate policymakers, scientists, and engineers who can create, maintain, and regulate those energy plans. It will also provide foreign investment dollars for specific renewable technology projects, supplementing programs like the CDM, the World Bank, and regional development banks.

Renewable Energy Will Help Achieve Both Climate Change and MDG Goals

In 2000, world leaders outlined eight Millennium Development Goals to achieve by 2015. They are 1) Eradicate extreme poverty and hunger; 2) Achieve universal primary education; 3) Promote gender equality and empower women; 4) Reduce child mortality; 5) Improve maternal health; 6) Combat HIV/AIDS, malaria and other diseases; 7) Ensure environmental sustainability; and 8) Develop a global partnership for development. Working on economic development through renewable energy technology investment and education partnerships will help address several of these goals.

Alleviating Poverty

"To implement the goal accepted by the international community to halve the proportion of people living on less than U.S.$1 per day by 2015, access to affordable energy services is a prerequisite." According to UNDP, "countries that develop overtime do so in tandem with improvements in energy. In fact, no country in modern times has substantially reduced poverty without a massive increase in the use of energy and/or shift in to energy efficient economies." (UNDP et al., Energy Sustainable Development Fact Sheet)

Universal Primary Education and Empowerment of Women

"Woodfuel consumption practices have….led to deforestation, which has affected negatively women and children who have to walk long distances to collect the resource." (Economic Commission for Africa, 2006: 18).

"The accessibility of renewables at affordable prices would lighten the women's workload and create new roles that lead to economic growth as well as making the women economically independent." (Economic Commission for Africa, 2006: 20)

Because of this nexus between renewable energy projects and achievement of Millennium Development Goals, work on identifying dollars to support MDGs could lead to increased support for this initiative, specifically through funding mechanisms like the International Financial Facility.

NGO Alternative

Even absent a new protocol, some of the ideas in this paper could be driven through the non-profit and business sectors. Right now, the business community and public are ripe for this kind of initiative. Initiatives like those of Virgin Airlines and Silverjet Airlines and websites like www.climatecare.org are just a few ways that the corporate community and individuals are already responding. An organization with a significant bully pulpit and strong persuasion and fundraising capacity could attract significant new resources and pull many of these initiatives together into a cohesive campaign with significant impact. An NGO-organized and managed program could support science and engineering education scholarships and partnerships, as well as build resources for renewable energy technology investment. Without financial support from developed countries, however, the pool of dollars available could be significantly less and the ability to coordinate with existing international organizations may be hampered with the NGO model.

Conclusion

Experts suggest that there are three essential components to solving the climate change problem: a massive research and development effort; "flexible provisions for emissions reductions;" and finding a way to engage the developing world, because their potential for growth will quickly outpace the developed world. (Jacoby et al., 2000: 526) The cap and trade markets and Clean Development Mechanism spawned by the Kyoto Protocol provide hope that the world will

embrace flexible mechanisms for emissions reductions. That leaves two important items still on the table: 1) creation of a major research and development initiative and 2) finding a way to bring the developing world into the fold. I would argue that U.S., Japan, Canada, the European Union and other developed countries will likely wish to invest in research and development in their own countries, rather than through an international fund so that business in their country will have an edge in supplying new technology to the rest of the world. That is needed and should be encouraged.

That leaves the developing world. Even though market mechanisms to engage the developing world have been developed – the CDM, for example – much of the developing world is simply not ready yet to participate. Through the Capacity Building and Renewable Energy Protocol, I propose a way to prime the pump, to provide the developing world with new tools and resources so they can become active players in the broader markets, to help them solve key issues they have addressed as barriers, and to help them "leap frog the fossil fuel phase" so that while they are growing economically, they are contributing less to climate change.

Note: Special thanks to Professors Susskind and Moomaw for their help and guidance on this paper. These concepts are not entirely new: after I began work on this idea, Professor Susskind shared with me, and the class, that he had developed a proposal with similar ideas at an earlier date. My hope is that this paper adds to the thinking on the topic.

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Notes:

[1] Throughout this paper, North refers to the industrialized countries of the global North, and South refers to poorer developing countries in the global South.
[2] There are 30 OECD member countries, which are for the most part, the wealthiest countries in the world. These countries include the United States, much of Europe, Australia and Japan.
[3] The Clean Development Mechanism is a mechanism whereby developed countries can meet their emissions targets under the Kyoto protocol by investing in emission-reducing projects in the developing world.
[4] According to the Travel Industry Association, in 2004, Americans took roughly 1.2 B trips; 16% were by air. That means that Americans took 192 million flights. If you charged a $5 tax to each fare, the tax income would total about $960 million.