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Climate Change and the L20
Options for Non-Emission Target Commitments

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The L20 should address climate change primarily through non-emission based approaches for several reasons. First, alternatives to emission targets could compliment national emission targets taken under the Kyoto Protocol and elsewhere. Even the strongest advocates of emission targets accept that other policies are needed to ensure maximum progress by all parties. Second, non-emission based commitments could become a useful alternative to or substitute for emission targets beyond Kyoto, should those efforts fail to gain support. So far only nations accounting for less than a quarter of global emissions have accepted legally binding national emission targets. While the political will for emission targets should grow over time, resistance in the United States, Brazil, China, India and other key L20 nations will not evaporate quickly and this provides a strong reason to consider alternative policies.

Perhaps most importantly, the L20's comparative advantage on climate change is as an innovator. The L20 heads of state could link climate change to a larger set of issues, and in this way reframe the international problem in ways that key nations view as far more relevant to their national interests than the narrow question of emission levels. In contrast to heads of state, specialized climate change bodies lack authority or competence over many important policies that influence global warming, such as trade, investment, foreign aid and energy policy. Work on

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emission targets, moreover, will continue in climate forums even absent intervention by the L20. The best use of the L20 would be for it to take up new approaches beyond emission targets.

The L20 could examine any number of non-emission based forms of international agreement. Three ideas that might be amenable to meaningful quantitative commitments or targets are presented below in some detail – renewable energy standards, biofuel policies, and clean energy trade liberalization. Also discussed briefly at the conclusion of this paper as possible areas for L20 cooperation is climate science and clean energy research.

1. Renewable Energy Standards

Power generation is a major contributor to climate change in L20 nations. In the United States, for example, power generation accounts for approximately 39% of emissions. L20 nations (except possibly Saudi Arabia) share an interest in promoting the development of affordable renewable energy for electricity generation. Indeed, most L20 nations already have policies in place to significantly increase renewable energy production over the coming decade. In theory, therefore, the L20 could develop common renewable energy goals for electric power. Renewable energy goals might be less economically efficient than other approaches to climate change, such as market based emission targets or taxes, but the former may deserve attention anyway given the political difficulties associated with targets and taxes.

Formulating workable L20 renewable power goals would prove challenging, however, because L20 member states rely on renewable energy in varying degrees. Nations have different natural capacities to generate power through renewable energy with existing technology. Brazil, with its abundant rainfall, meets 83% percent of its electricity demand through hydropower. Japan, in contrast, produces only 10.2% percent of its electricity using renewable energy. The figures for the United States, China, India and Mexico differ significantly, as discussed below. Reliance on renewable energy also varies with economic development and growth rates. Historically, burning carbon fuels (particularly coal) has been the least expensive means to produce electricity. In recent years a few renewable technologies, most notably wind energy, have become cost effective, particularly after taking environmental costs into account. Countries

that are now adding large amounts of electric power capacity, therefore, are more likely to have renewable power in their portfolio than similarly situated nations whose economies are not growing.

Despite differences of this sort, non-petroleum exporting L20 nations share a desire to generate a *growing* percentage of their *new* electricity capacity through renewable sources. Under the right circumstances L20 leaders might agree to a quantitative target for renewable electricity generation as a percentage of new capacity brought online over the next five to ten years. Many L20 nations (including now China), moreover, are committed to moving away from large-scale hydro projects given the perceived social, economic and environmental costs. An L20 target for new renewable capacity could be tailored to encourage non-hydro energy as appropriate.

For an indication of the likely stringency of such a target, consider the policies already in place in the four most populous L20 players -- the European Union (EU), China, the United States and India.

- Prior to enlargement, the EU (15) committed to produce 22% of its electricity from renewable sources by 2010. The goal for the newly expanded EU (25) is 21% over the same period. As of 2001, 15.2% of electricity in the EU (15) was renewable. The European Commission estimates that with the current national policies the EU (15) will only achieve 18-19% by the end of the decade. From 2000-2010, 28% of new EU (15) capacity will be non-hydro renewable (mostly wind). Non-hydro renewable energy is expected to be roughly 10.4% of EU (15) capacity by 2010.
- In June 2004, China committed to installing at least 60 GW of renewable energy by 2010, discluding large-scale hydro power. This means that between now and 2010, roughly 14% of all new electric capacity in China will be non-large-scale hydro renewable energy. China's current use of renewable energy is thought to be around 5-6% of current capacity.
- The world's largest energy consumer, the United States, is not surprisingly the world's largest generator of non-hydroelectric renewable electricity. Yet, non-hydro renewable capacity only contributes 1.6% to the U.S. electricity supply. That figure is expected to grow over the next decade. Indeed, over the last four years, 2.6% of newly installed capacity in the United States was non-hydro renewable. The US Energy Information Agency (EIA) forecasts that by 2010 15.8% of new capacity in the United States will be non-hydro renewable. The relatively recent adoption of 'renewable portfolio standards' by 13 U.S. states will help the United States meet this projected level.

- In India, renewable electricity represents roughly 15.8% of current production, of which roughly 3% is non-hydro. Though India has not committed to legally binding renewable electricity standards, it has pledged to install 1.5 GW of non-hydro renewable energy from 2002-2007. In the absence of any other policy, this means that approximately 4-5% of new capacity will be from non-hydro renewable sources. In 2000, India also agreed in the context of a state visit by President Bill Clinton to a non-binding target of generating 10% of all new electricity capacity from renewable energy. India has not backed away from that target but it has not featured prominently in India's internal policy debates.

Many L20 nations would be unlikely to accept a common renewable energy goal unless it was structured with great care to take into account different national interests. Several types of concerns would need to be addressed.

Any proposed L20 goal more stringent than the United States' expected performance (15.8% of new capacity from non-hydro renewable sources by 2010) might prove difficult for the United States to accept. A second George W. Bush administration in all likelihood would oppose it, as would the U.S. Congress, given legislative resistance to national renewable energy standards. Superpowers rarely change their economic and energy policies to conform to international pressure and the United States has proven particularly willing to stand apart from an international consensus on climate change.

A lowest common denominator target, of course, would accomplish little. Importantly, however, several L20 nations are lagging behind the United States in adding new renewable energy capacity. India, as mentioned previously, expects that only 4-5% of new capacity will be non-hydro renewable by 2007 but has already pledged internationally to reach a 10% level. Mexico, which will require 25GW of new power through 2010, plans to construct natural gas power plants rather than relying on non-hydro renewable sources. With the right incentives, these nations might be convinced to increase their renewable power investments. Even Canada produces only 1% of its electricity from non-hydro renewable energy (although it produces an impressive 56% of its electricity from hydro). Canada too might make a larger investment in non-hydro electricity as part of an L20 agreement, although the L20 could accommodate nations such as Canada and Brazil that already rely primarily on renewable energy.

Traditionally, China, Brazil, India and other developing nations have resisted as a matter of principle efforts to persuade them to make international commitments relating to energy and climate change *even when those commitments are consistent with their existing policies and would not be legally binding.* Developing nations might resist an L20 renewable energy goal even if the cost were low. Developing nations might accept such a target if developed nations took steps to reduce the cost of financing renewable energy investments through grants, loans and guarantees. Regardless, a renewable target would stand a better chance of acceptance by developing nations than a Kyoto-style emissions target. Emission levels are less predictable than renewable electricity production and the former carry more than a decade of political baggage.

To achieve a genuine consensus the L20 would need to address the interests of petroleum producers such as Saudi Arabia as well. Like the United States, Saudi Arabia has shown repeatedly its willingness to block international norms that might harm the kingdom's long term economic interests in global petroleum consumption. In the context of climate change negotiations, however, Saudi Arabia has joined the international consensus when developed nations have shown a willingness to pursue policies that would help the kingdom diversify its economy. While financial assistance for Saudi Arabia might not be appropriate, trade and investment reform – coupled with a commitment to pursue cooperative solar energy research and development – might help strengthen the Saudi economy and enhance Middle East security.

In view of where nations stand today and likely political reactions to an L20 renewable energy goal, only a modest near-term standard would be politically and technically possible. For example, each L20 nation could commit that between 10-16% of its new electric capacity will come from non-large-scale hydroelectric renewable energy by 2010. Nations such as Canada and Brazil that meet more than 50% of their electricity needs through hydropower could receive partial credit for existing investments, as appropriate. If necessary, OECD nations could agree to provide substantial additional funding to help developing nations accelerate renewable energy investments. This approach would require a few nations to go beyond their existing policies but the EU, China and the United States could rely in large measure on existing laws. Though a 10-16% target may seem inconsequential as a result, it would be a significant step forward for three reasons. First, the renewable energy electricity goal would be the first quantitative climate-

friendly energy target applicable to the United States, China and India alike – a very important precedent. Second, it would encourage lagging nations such as Japan, India and Mexico to install renewable energy capacity more rapidly. The environmental benefits could prove significant. Third, it would provide an additional platform for international action beyond the Kyoto Protocol. L20 renewable energy standards could be in addition to or instead of a continuation of the Kyoto process.

2. Biofuels

Biofuels are another area where the L20 might reach agreement. Transportation is one of the fastest growing sources of greenhouse gases globally, particularly in the developing nations in the L20. Biofuel such as ethanol and biodiesel can be produced from sugar cane, corn, agricultural waste, or crops growth expressly for fuel. When blended with gasoline or diesel, many biofuels reduce oil consumption without requiring significant changes to automobiles. Reliance on biofuels, therefore, helps improve air quality (by burning cleaner than petroleum fuels), enhances energy security (by lowering demand for petroleum) and provides income to rural communities (where biofuel crops are grown and processed). While many of today's biofuels have only modest climate change benefits because they are made from agricultural commodities that require significant energy to grow, a new generation of climate-friendly biofuels is within view.

With the exception of Saudi Arabia, L20 nations share a common interest in developing safe, clean and affordable biofuels. The L20 could speed the transition to advanced biofuels by adopting a number of common policies. First, the L20 could develop biofuel fuel standards. Each nation would pledge to ensure that a minimum percentage of its transport fuels came from renewable biomass. As part of this standard setting process, the L20 would agree to progressively improve the energy balance of their biofuels. This means that over time L20 nations would ensure that their biofuels require less and less energy to make in comparison to the energy they provide. Furthermore, each L20 nation could pledge to increase its funding for biofuel research and development. Nations might even agree to individual or collective funding targets. Finally, the L20 would pledge to work together within the Doha trade round to allow nations that reduce

food production subsidies to replace them with incentives for farmers to grow environmentally beneficial biofuel crops. Of these policies the most immediate contribution to climate change efforts might come from the establishment of a common minimum biofuel standard. Where key L20 nations stand on that issue is discussed below.

Most L20 nations are moving rapidly into the biofuel arena but few have national-level biofuel minimum content targets. Standards of this sort may be less cost effective than alternative approaches to climate change but they may prove politically more realistic and therefore better than existing policy. Production and consumption of biofuels, moreover, is concentrated in just a few regions.

- Brazil is the undisputed leader in biofuel production accounting for 59% of the global market. Relying on ethanol from sugar cane since the mid 1970s, Brazil requires that all gasoline contain at least 22-24% ethanol.
- The EU 2003 biofuels directive requires that biofuel represent no less that 2% of all fuel consumed by 2005 and no less than 5.75% by 2010. There are questions as to whether the EU will meet its initial 2005 target.
- China has not set a national biofuel target but two provinces (Hainan and Jilin) have required 10% ethanol blends since 2003. China has also committed to having 17% of all energy come from renewable sources by 2015 and biofuels are expected to play a large role.
- Ethanol production in the United States has risen 91% since 1999 to 2.81 billion gallons making the United States the world's second largest biofuels producer. Biofuels save the United States over $2 billion in oil imports every year and increases farm incomes by more than $4.5 billion annually. However, in light of the high level of gasoline consumed in the United States, biofuels represent only 1.5% of total U.S. motor fuel. The United States does not have a national biofuel minimum standard but relies instead on production subsidies.
- India, Japan and Canada have taken limited action in promoting biofuels. Japan produced only 129 million gallons of ethanol last year and but is reported to be interested in increasing its production and consumption. Nine Indian states and two Canadian provinces have minimum biofuel requirements. None of these nations have national minimum biofuel standards.

In light of the broad interest among L20 nations, biofuels represent a promising area of future international cooperation. Nevertheless, with so few nations having neither adopted national standards nor even conducted detailed projections of biofuel production by 2010, L20

leaders might find it difficult to agree on a common biofuel standard any time soon. Perhaps the most favorable outcome the L20 might secure at this stage would be to initiate a political and analytical process for evaluating the feasibility of quantitative biofuel targets. Impediments to common biofuel standards, however, should not stop the L20 from agreeing now to both increase biofuel R&D funding and work together to preserve space within the WTO for biofuel subsidies.

3. Barriers to Investment in Clean Energy

Another area where the L20 might reach consensus is on the need to remove many barriers to trade and investment in clean energy technologies. Most L20 parties wish to promote a clean energy future. Expediting the diffusion of clean energy technologies would support climate friendly action around the world. Opening markets to clean energy products, services and investment could be a boon for both the global environment and the global economy. Trade liberalization in these areas would promote economic growth while also lowering emissions.

Some barriers to investment in clean energy are well documented. Foreign ownership restrictions are one example. China for example, requires that all power investments over $30 million be approved by the central government, whose approval is rare. India caps foreign ownership on energy investments over $350 million. But more often than not more subtle obstacles are present such as informal administrative practices, bureaucratic red tape, corruption and judicial bias. Traditional energy sources are often given favorable access to power grids and transmission lines over renewable energy. Power generation contracts are difficult to enforce. Local authorities expropriate land, violate intellectual property protections on advanced technologies or confiscate equipment. The prevalence of these practices and their relative roles in impeding clean energy investment are poorly understood.

The L20 should create a working group to determine what barriers to clean energy currently exist in its member states and how they might be overcome. The working group would be staffed by representatives of all parties and could be funded by voluntary contributions. The working group would be charged with developing country-specific studies for each L20 nation within two years. Heads of state could take up the final reports and consider policy reforms. Any

detrimental impacts from removing barriers in developing nations might be offset through a package of export subsidies, loans, guarantees or other assistance from countries whose companies would benefit from improved market access.

4. Other Ideas

Science and clean energy technology R&D are two other areas of possible L20 cooperation. Space limitations preclude an in-depth exploration, but the potential for progress is significant enough to warrant a brief description of possible approaches. Cooperation in these areas is needed, but might be politically less attractive for some L20 partners since action of this type has tended to be seen as an alternative to more ambitious policies that would abate emissions in the near term.

L20 members agree on the importance of reducing scientific uncertainty surrounding climate change policy. While basic research on atmospheric change is well funded and occurring elsewhere, L20 could play a role in helping its member states understand more fully how climate change intersects with their specific national circumstances. As political will to address climate change will depend in large part on whether the risks of global warming are well understood, the L20 could sponsor case studies on how climate change may impact each of its member states. The G20 finance ministers have used the case study approach in the past with some success. Currently, neither the IPCC nor the UNFCCC are conducting or funding in-depth *national* impact assessments and many L20 developing nations lack a precise understanding of how global warming would effect their security, environment or economy. Similarly, the L20 could analyze the steps its members would need to take to adapt to inevitable climate change. Unlike the UNFCCC, which is focused via the GEF on funding for specific adaptation pilot projects, the L20 could concentrate on developing broad national adaptation plans and priorities.

L20 nations are increasingly cooperating in their efforts to developed advanced energy technologies.

- International Thermonuclear Experimental Reactor is a joint venture between the United States, the EU, Korea, Japan, Russia and China to develop fusion energy for peaceful purposes.

- International Partnership for the Hydrogen Economy coordinates research and commercialization policies for hydrogen and fuel cell technologies. The partnership involves several L20 members including the United States, the EU, China, India, Russia, Canada, Japan and Brazil.

- Carbon Sequestration Leadership Forum is an international initiative to develop carbon capture and storage as a means of combating climate change. Eleven L20 countries are participating in this project including the United States, the EU, Russia, China, Brazil and India.

- Several L20 countries have agreed to share research and techniques to harvest methane escaping from landfills, coal mines, oil and gas fields and pipelines. The participating countries include the United States, Britain, Italy, India, Mexico, and Japan with Russia expected to join shortly.

Developing countries in the L20 are involved in many of these efforts in only minor ways because they lack the financial and sometimes technical capacity to participate equally. In addition, no developing nation is participating in all of the initiatives, unlike the United States, EU and Russia. The L20 could examine ways to help major developing nations to become more active partners in ongoing international energy technology projects. Bringing in developing nations would deepen international energy and climate change cooperation in areas of interest to developing countries while also improving the prospects that these countries would mitigate their emission by adopting new technologies at an early stage. While concerns about intellectual property rights may present understandable obstacles to broader international energy R&D, a careful examination of a variety of possible new arrangements is warranted.