Center for American Progress

the alliance for climate protection

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The U.S. Role in International Climate Finance

A Blueprint for Near-Term Leadership

December 2010

Based on analysis by

project catalyst

Climate Advisers

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A Message from Vice President Al Gore

These are challenging times for people around the world who know that the climate crisis is real, urgent, and worsening. Despite the mounting evidence that prompt action is essential, many international leaders continue to treat the facts as inconvenient. In their eyes, there are always reasons to oppose commitment: for some politicians, it is the desire for the power that can be gained by pandering to carbon polluters and ideological opponents of action; for others it is fear of being targeted for retribution by those same forces. For the carbon polluters, of course, it is profit—coupled with the vulnerability inherent in human nature that leads us to reject and lash out at truths we perceive to be counter to our own short-term self-interest.

And for the general public, understandably, it is fear that one way or the other it is they who will pay. Moreover, the unprecedented nature of this crisis—and the unprecedented scale and scope of the needed response—leads many to eagerly seize upon any purported reason to believe that the climate crisis may not be real after all. That is why the deniers gain such leverage by manufacturing doubt from blatant falsehoods.

For their part, climate scientists are naturally unaccustomed to the political combat that often now seems necessary just to communicate these crucial truths to the general public – across the great divide between science and politics.

It would be a deep and welcome relief indeed if the climate crisis turned out to be not real, or not dire. Unfortunately, however, it is both. Voluminous evidence makes the broad outlines of the unfolding catastrophe crystal clear. Moreover, the data are consistent across 12 separate and different scientific lines of evidence used to measure and understand global warming.

Every day, we humans continue to dump 90 million tons of global warming pollution into the thin shell of atmosphere surrounding the earth – as if it is an open sewer. Twenty percent of each day's spew will still be there 1,000 years from now. In keeping with the laws of physics, it traps a lot of heat for a long time.

The resulting damage to the earth's ecological systems – direct and indirect – is already accelerating. The hydrological cycle, to pick only one example, is being massively disrupted. The timing, location and intensity of precipitation are all changing significantly. The warmer air is holding more water vapor. Storms are stronger and last longer; big downpours play a larger role. Millions of subsistence

farmers can no longer predict the safest and best time to plant. Major floods, mudslides and resulting infrastructure damage are increasing. Important regions in Africa, Asia, Europe, the Americas and Australia are suffering from deepening droughts. The fires are burning. Living species are being driven to extinction. Deserts and diseases are on the move. The ice is melting. The seas are rising.

The general conclusions of the Intergovernmental Panel on Climate Change (whose authority and expertise are intact despite several unfortunate errors in its 3,000 page Fourth Assessment issued in 2007, and notwithstanding the ferocious attacks against it) are in line with the views of 98% of the world's climate scientists (according to a recent study), and are shared by the National Academies of Science of every major nation on earth. They are shared as well by every major professional scientific society worldwide.

Paradoxically, even as the scientific consensus has grown ever stronger, the political consensus has grown weaker – at least temporarily. It is a source of hope and inspiration that at the grassroots level public awareness and support for action has grown with astonishing swiftness all over the world in the last 5 years. And tens of thousands of businesses, big and small, have begun to help solve the crisis. But opponents of action have dug in their heels, and many have found ways to use their wealth and power to paralyze the political process in many nations, including especially in the United States.

These are tumultuous times, and in such times it is up to governmental leaders to show the way to security and stability. For our era, any such path must bring us to a place where sustainable economic growth and saving the global environment can be reconciled – or in the end, we will preserve neither.

At this juncture, we realize that American leadership is no longer sufficient, but we must remember that it remains essential. If the United States were to continue in its failure to step up to climate change, a successful international effort would remain out of the question. To safeguard the future of our civilization, we must avoid that outcome. Success may not come in the next two years, but come it must. In the words of the poet, Wallace Stevens: "After the final no there comes a yes and on that yes the future of the world hangs."

Anyone who believes that isolated national initiatives and bilateral agreements can substitute for a global effort should take note of a little-noticed milestone reached last year: developing nations as a group have surpassed the industrial nations as the largest source of CO_2 emissions. Indeed, 90 percent of the predicted increases

in emissions in the years ahead, over and above today's reckless levels, may come from the poor nations, not the wealthy. These struggling societies need help from the developed nations to have any chance of success in making the changes that are essential.

In order to lead an effective international effort, the United States must demonstrate public consensus sufficient to last for years and decades, not just for a season. We have this capacity; we demonstrated it numerous times in the second half of the 20th Century, including in the successful implementation of the Marshall Plan, the building of the interstate highway system, and the Apollo Moon landing program, to name a few of the best known examples. So far, however, with respect to this challenge, we have failed to do so. The reasons for this will be far less important in the eyes of future generations, than the fact.

In order to confront the climate crisis, many policy changes are needed, but it is important not only to advocate but also to move from rhetoric to practical design. We need to convince the public that climate change is an actionable problem; that the solutions are available; that a coordinated approach is feasible; that financing the necessary changes is affordable; and that paying for those changes is, in fact, a wise investment in future prosperity.

That is why I am acting to call your attention to *The U.S. Role in International Climate Finance: A Blueprint for Near-Term Leadership*, prepared by the Alliance for Climate Protection and the Center for American Progress, based on analysis by Climate Advisers and Project Catalyst. This study is a demonstration of how to integrate financing solutions into the key elements of an effective response to the climate crisis. It shows how to match money with actions on the ground and provides the basis for a plan that is simultaneously global in scope, and local in action. And to Americans, in particular, it is a demonstration that not only is our leadership needed for global purposes, but that it is needed for our own self-interest.

Foreword

We sponsored this joint report by the Alliance for Climate Protection and the Center for American Progress, based on analysis by Climate Advisers and Project Catalyst, to help convey an important truth: the United States must find the political will to lead on international climate finance, and doing so is possible despite current economic and political conditions.

While the past two years have brought many ups and downs in international and domestic climate policy, one of the most promising developments was the acceptance by all major economies of the scientific consensus that the world must limit global warming to no more than 2 degrees Celsius (3.6 degrees Fahrenheit) above pre-industrial levels. For the first time the world has an enduring measuring stick against which to gauge progress. Another positive development has been that all major economies for the first time have outlined the emissions reductions they plan to achieve through 2020. A review of these commitments shows that some nations are already taking impressive action, others have promised new measures, and still others are doing and planning very little. Despite this diversity, these pledges provide a starting point for a truly global effort.

We must acknowledge, though, that recent events in the United States have been deeply disappointing to all those at home and abroad who seek American leadership on climate change. Climate legislation collapsed in the U.S. Senate, and the results of the recent midterm elections appear to have taken the most promising solutions off the table for the time being. Nonetheless, it is clear that the Obama administration is pursuing policies and programs that can help mitigate U.S. emissions—including efforts to improve vehicle efficiency, clamp down on old, highly polluting coal power plants, invest in renewable energy technologies and regulate greenhouse gases under the Clean Air Act. In addition, the United States is currently on track to deliver over $4 billion in "fast start" climate financing for developing countries. However, these efforts will not be sufficient to meet the United States' share of a global effort, even if the measures are enough to fulfill the U.S. pledge under the Copenhagen Accord. And even while many U.S. states are moving forward with their own policies to curb climate pollution, overall, the sum of all U.S. policies will not protect vital U.S. and global economic, security, public health and environmental interests in the face of ravaging climate change. We are therefore deeply concerned about the inability of our nation to come to terms with the enormity of the climate crisis and mount an ambitious, comprehensive response. This failure has many causes, from the influence of pol-

luters and corporate special interests in U.S. politics to the aftermath of the recent recession. Even in the face of these unavoidable political realities, we believe the United States can reduce emissions well below current levels by 2020 if it aggressively pursues a mix of climate and energy policies.

From the data presented in this report, however, we know that even if all countries meet their existing emissions mitigation pledges for 2020, a substantial gap will remain between these emissions reductions and the reductions needed to limit climate change to 2 degrees Celsius. In fact, if countries only achieve the low end of their proposed policies, the world still will need to avoid an additional 6.5 billion tons of carbon dioxide per year by 2020, more than current total U.S. energy sector emissions. The questions at the forefront of our minds, then, are *where should the world go from here* and *how can the United States do its part?*

After taking a hard look at the data, the authors of this report conclude—and we agree—that the United States and other developed nations must partner with developing nations, particularly major emerging economies, to help them implement additional strategies for low-emissions development. These would be new initiatives to grow their economies, increase efficiency and security, reduce greenhouse gas emissions, and improve resilience to climate impacts—all through collaboration that will require leadership from a broad range of public and private actors.

This report explains why such a partnership is in the vital national interests of the United States—including to help close the competitiveness gap with China and other countries over clean energy technologies—and provides a blueprint for U.S. action in the near-term through 2015. Engaging other nations, particularly developing countries, will require new U.S. investments in international climate finance. Mobilizing new public and private resources in the near term will not be easy, but this report shows that it will not be impossible either.

Make no mistake: our purpose is not to shift the burden of emissions reductions to developing nations that have done less to cause the climate crisis, have the least capacity to respond, and are the most vulnerable to climate impacts. The United States and other developed nations must do their part at home. But we also must internalize the political reality that U.S. domestic emissions reductions will not be sufficient in the near term and that our nation has to find other ways to contribute to an effective global effort. To that end we must expand our work to support other nations that are making good-faith efforts to reduce their emissions.

Importantly, all "climate hawks"—the ever growing circle of civic, health, educational, business, foreign policy and national security leaders, international development advocates, faith communities and environmentalists who understand why strong climate policies are essential—must take responsibility for building the political will needed to turn this blueprint for U.S. action on international climate finance into a reality. A sustained and coordinated public education and advocacy effort will be essential to eventual success.

The authors of this report are Andrew Stevenson and Nigel Purvis from Climate Advisers, Claire O'Connor from the Alliance for Climate Protection, and Andrew Light from the Center for American Progress. We are grateful for the persuasive case they have made for U.S. leadership on international climate finance and their insightful policy recommendations.

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Executive Summary

Key Findings

- The vital national interests of the United States require our nation to forge a global partnership with developing nations to accelerate their climate actions through new international investments in clean energy technologies, energy efficiency, tropical forest conservation and climate adaptation.

- New U.S. investments in financing international climate action will yield many benefits including:

  - Increased competitiveness with China and other trading partners by U.S. firms, helping them capture a substantially larger share of global clean energy markets—worth $2 trillion annually and rapidly growing.

  - Reduced risks of climate-related national security threats, including from severe floods or droughts in Pakistan and the Middle East.

  - Stronger relationships with key strategic allies and major emerging economies, such as Indonesia, India, and Brazil, that will enhance America's ability to build global coalitions on security and economic policy and advance democratic ideals.

  - Billions of dollars in reduced climate impacts in the United States, including on U.S. coastal infrastructure and farmers.

  - Improved energy security and lower energy prices for traditional fuels.

- All major nations—including China, India, and other emerging economies—have agreed to limit global temperature increases to 2 degrees Celsius (3.6 degrees Fahrenheit) above pre-industrial levels. Scientists concur that this is the maximum level of warming allowable to stand a good chance of avoiding dangerous and potentially catastrophic climate change.

- Spurred in part by the creation of the Copenhagen Accord, all these major carbon emitters have outlined and begun to implement emissions reduction policies through 2020 toward the global temperature objective.

- But more ambitious climate actions are needed worldwide—a gap of 6.5 billion tons of carbon dioxide per year exists between the low end of possible emissions reduction outcomes through 2020 from countries' unconditional pledges and existing policies, and the necessary emissions reductions by that date to place the world on a pathway to reaching the 2 degree objective.

- With the collapse of comprehensive climate legislation in the United States and significant gains by climate skeptics in U.S. mid-term elections, domestic climate champions and the international climate community wonder whether the United States can still lead.

- The United States can restore its international credibility and help to close more than half the gap in global climate ambition by leading a new international partnership to scale up emissions mitigation measures of developing nations.

- The partnership must supplement, not become a substitute for, far stronger domestic policies to reduce U.S. emissions.

- The international partnership will require combining technical expertise, innovative thinking, political determination, and, importantly, new financial resources to help reduce the costs of green growth and low-emissions development in developing nations.

- Globally, an additional *capital investment* of about $100 billion per year by 2020 is needed, along with additional *incremental cost financing* of about $60 billion per year by 2020.

- Billions more in additional financing also will be needed for climate adaptation.

- Compared to annual spending by major economies on fossil fuel subsidies ($312 billion), energy ($5 trillion), and infrastructure ($7 trillion), these sums are small.

- The world will need to draw on a variety of existing and new sources of finance to meet these investments, including public budget resources, carbon markets, development bank lending, and private financing. A recent high-level report

commissioned by the United Nations Secretary-General described the task of mobilizing new international resources for climate finance as challenging but feasible in view of global economic and political conditions.

- Efforts to mobilize new international climate financing could be delayed by differences among countries about the ideal mix of public and private investment. Thus, while working toward consensus for 2020, countries should set global funding goals for each of the following four sources: public funding, private investment, multilateral development bank lending, and carbon markets.

- To develop a strategy for success, the world and the United States should focus on concrete objectives for near-term progress (2013–2015) while ensuring international climate goals are consistent with economic as well as political realities and aligned with broader economic, national security, and foreign policy priorities.

Policy Recommendations

- The United States should work collaboratively with other nations to ensure the following actions happen at the global level:

  - Developed nations should deliver on their "fast-start" financing pledges for the period 2010–2012, as announced at the 15th Conference of the Parties in Copenhagen in 2009. More specifically, nations should provide a combined $30 billion in total international climate financing from public sources over this period. Analysts estimate that current global pledges total about $28 billion.

  - To build on the fast-start period and make concrete progress toward longer-term goals, countries should create a new 2013–2015 ramp-up period for international climate finance. Countries could structure this period around helping developing nations achieve the following concrete objectives in line with the global 2 degree temperature goal:

    - Build an additional 125 gigawatts (GW) of *low-carbon power* above business-as-usual, reducing emissions by 400 million tons per year.

    - Improve *energy efficiency* by an amount equal to 4 percent of business-as-usual energy consumption, reducing emissions 1.4 billion tons per year.

- Limit emissions from *land use* by reducing deforestation 20 percent below recent levels by 2015, planting new trees and improving agricultural processes, lowering net emissions by 2.0 billion tons per year.

- Address *adaptation* needs by ensuring every country achieves at least a minimum level of climate resilience.

– While creating these new mitigation and adaptation goals for a 2013–2015 ramp-up period, countries should evaluate international financing needs, develop a process for identifying and agreeing on new sources of domestic and international financing, and set a deadline for countries to outline how they plan to contribute. Based on our analysis, the following resources are needed to achieve the interim goals listed above, constituting significant yet realistic increases in public and private investment compared to existing levels:

- **Public financing***:* $15 billion in 2013, increasing to $25 billion in 2015.
- **Carbon markets:** $5–$10 billion in 2013, increasing to $10–$20 billion in 2015, primarily from nations with existing cap-and-trade systems.
- **Development bank lending:** $10–$15 billion in 2013, increasing to $15–$20 billion in 2015.
- **Private financing:** $40–$120 billion in 2013, increasing to $60–$160 billion in 2015.

– Countries should not only pursue this global partnership through international climate negotiations, but also with equal vigor through parallel and complementary vehicles, such as bilateral and regional partnerships as well as other flexible multi-country initiatives.

– The United States should give special attention to creating new mechanisms for international transparency to ensure accountability and verify results.

• Financially, the United States should contribute to this vital global partnership in the following ways:

– Deliver its fair share of fast-start funding—approximately 20 percent of the global total, or a combined $6 billion over three years. Doing so will require a substantial increase in international climate programs in 2012 over 2010 levels.

- During the interim 2013–2015 period, the United States also should assume responsibility for mobilizing an average of 20 percent of public and private resources needed to achieve the climate goals outlined above. For public funding this would amount to $3 billion in 2013 and $5 billion in 2015, compared to roughly $1 billion in 2010.

- The United States should use some of this new funding to launch three to five new bilateral climate partnerships with key strategic allies, such as Indonesia and India, backed by U.S. financing of at least $500 million each.

- The United States should also spearhead an effort to increase multilateral development bank lending for renewables and energy efficiency to $15–$20 billion per year by 2015, subject to the World Bank and other institutions aligning existing lending with climate objectives.

- To advance these goals and safeguard the competitiveness of U.S. aviation and shipping carriers, the United States should work proactively with major trading partners to avoid unilateral taxes by other nations on U.S. carriers, including through new international agreements and sensible U.S. policies that mobilize international climate financing.

Introduction

The starting point for this report is the global scientific consensus that climate change represents a clear and present danger to the United States and the world. We do not try to restate the basic science of climate change. Most Americans understand that the risk of dangerous climate change is sufficiently great so as to warrant concerted U.S. and global action to prevent catastrophic and largely irreversible impacts.

This report addresses the narrow but topical question of whether the severity of the climate crisis necessitates a U.S.-led global partnership with developing nations to share costs of reducing emissions. Our conclusion is that it does. Thus, the report also highlights the more specific opportunities for U.S. leadership as part of this partnership.

Overall we find that substantial opportunities exist to increase the ambition of emissions reductions in developing countries. Success will depend on the United States and other developed nations providing increased levels of international financing to help developing nations close the gap between current emissions reduction pledges and global climate goals set by the United States and other nations. While additional U.S. domestic action is urgently needed and must remain a priority, the numbers show that U.S. leadership on international climate finance is also essential for the world to avoid dangerous climate impacts.

International financing discussions cover a wide range of issues, including consultation, analysis, and transparency procedures; "fast-start" financing from now through 2012; and the creation of new international financing mechanisms (such as a Green Fund). This report focuses primarily on the specific policy objectives and resulting international financing needs through 2015. We believe these near-term topics are major gaps in current global climate discussions and that filling them will prove key to future success. Our focus on this interim period, however, should not be understood as a rejection of other aspects of the international climate finance debate or the importance of meeting 2020 climate objectives.

In developing the report's recommendations, we took into account the recent results of the midterm elections and recognized that the United States is unlikely to enact comprehensive climate legislation over the next several years. Because of these developments, many concerned about the climate crisis are wondering whether the United States will be able to participate constructively in a global solution and deliver on the pledges it made only a year ago at the 15th Conference of the Parties in Copenhagen, which resulted in the Copenhagen Accord, a high-level political understanding on climate change negotiated by world leaders. Others worry about the slow pace of global climate negotiations and are eager to make progress through complementary strategies. Overall, progress is still possible with hard work and determination, but fresh ideas are needed to help adjust efforts to new political and economic circumstances at home and abroad.

This report is divided into six sections and a conclusion. The first section, "The Case for U.S. Leadership," argues why helping lead an effort to mobilize financing is in the United States' vital national interest. The second section, "Growing Global Interest in Climate Action," describes the many reasons developing countries are pursuing climate action and the policies they have put in place or pledged so far. Section III, "The Global Gap in Emissions Reduction Ambition," identifies the gap between these policies and the emissions reductions required to meet global climate targets. Section IV, "The Global Finance Challenge," discusses the additional financial support developing countries need to pursue more ambitious action. Section V, "New Sources of Finance," provides an overview of new sources of financing countries could mobilize to address those needs. The paper continues with policy recommendations for the world and the United States to start building this effort in section VI, "Climate Finance 2.0." Section VII concludes.

General Approach and Assumptions

In a variety of fora, including the G8, Major Economies Forum, and the United Nations Framework Convention on Climate Change (UNFCCC), world leaders have coalesced around the goal of limiting average global temperature increases to 2 degrees Celsius above pre-industrial levels. This objective underpins all analysis and modeling conducted for this report, including cost and financing estimates. Since this is the only globally agreed-upon climate benchmark, we believe it is a reasonable assumption. The phrase "global climate objectives" in this report uses the 2 degrees Celsius target as the benchmark. In some cases we also refer to stabilizing greenhouse gas concentrations in the atmosphere at 450 parts per million, which is generally defined as producing about a 50 percent probability of limiting temperature increases below 2 degrees Celsius.

Under the Copenhagen Accord, many nations indicated multiple possible levels of domestic emissions mitigation. We have made a general assumption that on average, developing countries will achieve their low-end Copenhagen pledges and existing policies without substantial new international financing. Where countries submitted multiple levels of proposed effort, we assume countries would require new international climate financing to achieve the higher levels of effort. While this will not be true in every instance, we believe this assumption is reasonable for purposes of this report for the following reasons. Based on their public statements, some countries are willing to meet their low-end pledges without financing. Other countries have made ambiguous statements or have not directly addressed the issue, and we were unable to get clarity from these countries in the time allotted for preparing this report. Trying to guess the intention of these countries would have led us to make highly subjective assumptions and could have led to an incorrect assumption for every country.

We expect that as nations refine their emissions mitigation policies, new analysis will be needed to update the figures we have presented in this report. To the extent that countries can identify additional opportunities that provide sufficient benefits to justify domestic action (like those in Section II), our financing figures

could overestimate actual needs. To the extent that countries cannot achieve their low-end pledges without international financing, our financing figures could underestimate actual needs.

Another important assumption underpinning our analysis is that countries are more concerned about minimizing the global costs of climate action than they are about ensuring that nations take domestic action based strictly on their historical responsibility for climate change—that is, their cumulative emissions since the beginning of the industrial revolution. We have assumed that subject to sufficient international financing, countries would prefer to create a global partnership to target the least-cost global reduction opportunities, mostly in developing countries. We believe this is a reasonable assumption given global political conditions, concerns about economic growth, and the significantly higher cost of emissions mitigation in developed nations compared to developing nations.

While the difference between developed and developing countries is becoming less distinct as emerging economies increase their levels of development, maintaining the groupings for this report made sense for several reasons. First, countries are facing more similar challenges within than across these groups in reducing emissions, making it helpful to group countries for our analysis. Second, the groups are especially important for the issue of international finance because countries have established the international principle that developed countries should cover the incremental costs of emissions reductions in developing nations. We do show that many emerging economies have access to affordable capital, however, and project how that fact changes the total international climate finance need.

Finally, this report provides much greater detail and analysis on financing required for emissions mitigation than for climate adaptation. While we believe adaptation is a serious problem that requires substantial global action and financing, sufficient data was not available to make specific recommendations about how to move forward. We also believe countries should keep their focus on avoiding as many impacts as possible. Further research on adaptation and the costs of adaptation is welcomed and essential.

I. The Case for U.S. Leadership

This report provides a comprehensive look at the current state of climate action, highlighting the gap between current pledges and global objectives. It outlines how international financing can help close that gap by supporting emissions reductions in developing nations and what the world and the United States should do through 2015 to deliver that financing. Because the United States' political and economic situation makes climate action difficult—yet the country plays a key role in capitalizing on financing opportunities—the report begins with an analysis of why mobilizing scarce domestic resources for international climate action is in the vital U.S. national interest.

Perhaps the strongest argument for U.S. action is that the magnitude of the climate crisis necessitates a global effort, and U.S. leadership and investments can catalyze action from the international community. The United States still has a unique role in global affairs, and few nations can match its ability to build coalitions and lead them to a common goal. On climate change in particular, U.S. leadership and influence with major emerging economies—including China, India, Brazil and South Africa—was essential in brokering the Copenhagen Accord, and countries have consistently sought greater climate leadership from the United States. As the world's largest economy and largest annual contributor of official development assistance, the United States has a disproportionate role to play in mobilizing resources and driving investment in climate solutions. And as one of the world's largest per capita emitters of greenhouse gases and the largest historical emitter, the United States also has a critical responsibility to lead, including by assisting other nations take action.

Globally, mitigation and adaptation investments will yield numerous benefits that will improve the lives of people in the United States and around the world, including protecting public health, increasing climate resilience of infrastructure, maintaining water supplies and agricultural productivity, preserving essential biodiversity, reducing poverty, and promoting economic growth and stability.

U.S. leadership on climate finance also will advance key American economic, national security, strategic, and environmental interests, such as promoting and strengthening relationships with key allies, increasing global energy security, expanding markets for U.S. technology companies, and strengthening national security by increasing the chance that the world meets its climate stabilization targets. Each of these points is elaborated below.

Economic interests

As countries recover from the financial crisis, global clean energy markets present an opportunity for the growth of new companies and industries. U.S. support for building the capacity to implement climate policies and investment in international clean technology deployment will create opportunities for American businesses and workers to tap into a growing global demand for climate-resilient technologies and services.

Ensuring that developing countries have the technical, institutional, and financial capacity to adopt clean energy technologies is an essential component of fostering global clean energy market development. U.S. support for such activities will promote job creation by increasing demand for clean energy products created by U.S. companies and research labs, those manufactured in the United States, and services provided by U.S. companies. HSBC Global Research, for example, forecasts the low-carbon energy market will triple over the next decade, reaching 2.2 trillion per annum by 2020.[1] If the United States maintains a 14 percent share of exports of environmental goods and services to developing countries, one estimate found that international climate investments in four clean energy technologies—smart grid equipment, mass transit, wind turbines, and solar photovoltaics—could create as many as 850,000 long-term jobs.[2] As one more specific example, the Center for American Progress found that U.S.–China cooperation to accelerate deployment of carbon capture and sequestration technology could create as many as 940,000 direct and indirect U.S. jobs by 2022.[3]

International climate investments also could benefit the U.S. economy more broadly by reducing global pressure on energy prices—particularly for oil. The International Energy Agency (IEA) compared oil and coal prices in scenarios where the world implements policies needed to meet global climate objectives versus the current trajectory of energy investments. In the climate policy scenario global oil prices were 10 percent lower and coal prices 23 percent lower than

business-as-usual, driven by lower global energy demand.[4] Given that 378 million gallons of gas are consumed on U.S. roads each day, investing in efforts to help major emerging economies increase efficiency and deploy clean technology will provide substantial benefits in the form of reduced prices for traditional fuels.

Climate financing also can limit the negative economic impacts on U.S. farmers and ranchers of illegal logging and deforestation in developing countries. An analysis by Avoided Deforestation Partners found that stopping deforestation abroad would increase U.S. agricultural revenues by $190–$270 billion between 2012 and 2030, mostly because of increased production in the United States.[5]

National security

In addition to their economic benefits, investments in mitigation and adaptation would strengthen U.S. national security by reducing the risk of destabilizing climate impacts abroad and helping countries cope with impacts that cannot be avoided. A growing body of research highlights the serious threat climate change poses to America's national security, underlining the need to build the capacity of developing nations to manage and adapt to the impacts of climate change. In its 2010 Quadrennial Defense Review, the U.S. Department of Defense highlighted climate change as a key issue "that will play a significant role in shaping the future security environment." As a result, the report argued for a new and scaled-up approach to the issue.[6]

U.S. investments that support countries in efforts to develop systems, institutions, and infrastructure to deal with the impacts of climate change can help prevent such stressors from escalating into conflicts that require military engagement. Extreme weather events, reduced access to fresh water, impaired food production, land loss and flooding, mass migrations, and the spread of diseases are just some examples of the types of economic and societal stressors climate change is likely to bring. Such stressors have the potential to cause global disruptions that increase U.S. humanitarian responsibilities, accelerate conflict, and exacerbate existing instability.

Recent floods in Pakistan provide a glimpse into how the impacts of climate change could affect U.S. national security. The floods in Pakistan damaged or destroyed nearly 1.9 million homes and severely impacted an area larger than England. More than 20 million people—about 10 percent of the total population—were exposed to homelessness, malnutrition, risks of epidemics, and loss of

livelihood.[7] Significant internal displacement put pressure on urban centers, fueling ethnic tensions. Responding to the disaster has cost the United States at least $463 million in direct relief efforts, and another $87 million in in-kind donations of food and rescue assistance.[8]

In addition, for vulnerable, already-unstable regions, climate change may act as a "threat multiplier,"[9] exacerbating existing tensions or political unrest. The additional strain placed on already limited government capacity and infrastructure will increase the likelihood of failed states and the growth of extremism. Water resources, for example, are already a sensitive issue in the Middle East. Climate change is projected to lead to a decrease in precipitation in the region of more than 25 percent by the end of the century, coupled with a 25 percent increase in evaporation over the same time period.[10] The net effect would be a significant reduction of water resources in already-scarce conditions. Extended drought conditions could lead to crop failure and livestock losses, spurring agricultural communities to migrate to other more fertile areas or urban centers. With the world's major economies competing for access to the region's oil resources, the potential for escalating tensions, economic disruption, and armed conflict is great.[11]

Climate change is also likely to threaten other countries important to U.S. national security. Increased droughts and flooding in Africa could exacerbate or prolong instability, cause migrations, and increase tension over water resources in countries such as Somalia.[12] Climate change in Colombia likely will cause shifts in precipitation patterns; increase the frequency and intensity of floods, droughts and tropical storms; and place additional pressure on local military and humanitarian resources.[13] Nearly 10 percent of Bangladesh is within three feet of mean sea level, leaving millions susceptible to frequent flooding, increased storm surges, and the land loss resulting from rising sea levels. Many of those displaced would spill over into neighboring India, where the border is already of such concern that India is building a fence to keep Bangladeshis out.[14]

Furthermore, investing in basic systems that secure drinking water and agricultural production will ensure populations have access to basic services, contributing to overall stability and quality of life. More politically and economically stable countries will be better equipped to prepare for and recover from the negative impacts of climate change, and weather any resulting disruptions. Overall, U.S. investments in international mitigation and adaptation would strengthen national security by reducing the risks of climate impacts and ensuring countries are prepared to manage those impacts that will inevitably occur.

Strategic relationships

In addition to national security considerations from climate impacts, U.S. leadership on international climate finance provides opportunities to establish strategic relationships with key allies that are looking to shift their growth to more climate-friendly pathways. Two key examples are India and Indonesia, where investments in clean energy and reducing deforestation, respectively, could have transformative impacts.

India clearly views clean energy as a major part of its economic future. It has built 6 GW of grid-connected renewable capacity and established a National Solar Mission to expand generation capacity to 20 GW by 2020.[15] To finance renewable energy deployment efforts, India has already levied a tax on coal, and it is seeking international support for a proposal to build an international network of clean technology centers.

President Obama recently returned from a trip to India, where he brought along several hundred American CEOs and announced his support for a permanent Indian seat on the UN Security Council. India is both a key economic partner as a market for advanced U.S. technology and a key strategic partner because of its proximity to and relationships with Pakistan and China. Supporting India's clean energy objectives provides a chance to strengthen economic ties and build trust toward the achievement of security objectives.

President Obama also recently visited Indonesia, a key strategic partner because it has the world's largest Muslim population and is a growing potential economic partner for the United States. Indonesia has made reductions in illegal logging and the transition toward a well-governed, sustainable forest sector a key part of its strategy to prove to investors and the world that it is ready to be a responsible member of the international economic community. Indonesia already announced a billion-dollar partnership with Norway on efforts to reduce deforestation, which include a planned moratorium on certain kinds of new land clearing. However, substantial challenges remain, and U.S. leadership, including financial assistance, could be critical in helping Indonesia overcome them.

In addition to the opportunity for strategic partnerships, a lack of action on climate change is increasingly threatening President Obama and the United States' standing in the world. Over time, doubts about U.S. leadership will continue to undermine global climate talks and thus slow climate action in other major

economies. The president's personal credibility is also on the line because the Copenhagen Accord is among his most substantial foreign policy achievements. A lack of leadership on an issue that is so important to many of our key allies and emerging economies could undermine U.S. strategic objectives in other areas, especially in the Asian region and in global economic and security cooperation. Conversely, showing unexpected leadership on international climate finance would help restore the president's international credibility and rebuild domestic support among progressives.

Environmental interests

It almost goes without noting that one of the most important reasons for U.S. leadership on international climate finance is to address the fastest-growing sources of global greenhouse gas emissions and reduce the risks of climate change impacts on the United States. Economic damages from global warming of 2.5 degrees Celsius are projected to be on the order of 1–2 percent of global gross domestic product (GDP), rising to 2–4 percent of GDP for warming of 4 degrees Celsius.[16]

Non–Organization for Economic Co-operation and Development (OECD) countries— namely emerging economies, such as China, India, Brazil, and Indonesia—will be responsible for almost 90 percent of global growth in energy demand over the next several decades and account for nearly three-fourths of global carbon dioxide (CO_2) emissions by 2050.[17] Developing countries are rapidly building infrastructure in the name of economic development, and that infrastructure will be in place for the next 4–5 decades. U.S. investments will help prevent developing countries from locking into energy-intensive infrastructure that will dramatically increase the costs of meeting global climate objectives. The IEA estimates that each year of delay will increase the investment needed to meet global climate objectives by $500 billion.[18] Even with successful mitigation, climate change will continue for decades because of the long life of greenhouse gases and the gradual release of excess heat stored in the oceans; making it imperative that countries take action now.

These investments are critical because the United States is far from immune to climate impacts, and indeed climate change is already affecting many places. According the United States Global Change Research Program, existing impacts that are projected to grow include "increases in heavy downpours, rising temperature and sea level, rapidly retreating glaciers, thawing permafrost, lengthening

growing seasons, lengthening ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and alterations in river flows."[19] Two areas the program identifies as facing the greatest climate adaptation challenges include crop and livestock production and human health.

Climate impacts also will affect the U.S. economy. Every region of the country has seen increases in heavy precipitation over the last several decades, and resulting floods have disrupted trucking and rail routes and overloaded water treatment facilities.[20] In addition, rising sea levels threaten the more than one-third of Americans that live near the coast.[21] In the Galveston Bay region located on the Texas coast, for example, relative sea level has already increased 0.6 meters over the last decade. Another 0.69 meter rise could displace nearly 80,000 households (or roughly 78 percent of the region in 2008) and cause more than $9 billion in damages.[22] The magnitude of the challenge ahead necessitates a global effort, and U.S. investments can foster this global response and catalyze action from the international community.

This section has discussed why mobilizing international financing to support climate action is in the vital U.S. national interest. The next section discusses the current state of international climate action to begin our analysis of how international climate finance can help close the gap between current emissions reduction pledges and global targets.

II. Growing Global Interest in Climate Action

Despite only modest progress in global climate negotiations, developing and developed countries are taking a growing interest in domestic climate and energy policies for two main reasons. First, countries are becoming increasingly aware of the on-the-ground realities of climate change. Some countries are already facing climate impacts and beginning to implement policies to increase their climate resilience and improve their ability to adapt to potentially devastating consequences of rising temperatures. Other countries have accepted the emerging consensus of global climate negotiations and begun to prepare their economies to be competitive in a world with carbon constraints or pricing.

Second, many countries, especially emerging economies, are recognizing that policies implemented primarily for reasons related to other development priorities also produce substantial climate benefits. Some reasons countries have begun implementing these climate-friendly policies include the following:

- **Energy and resource security.** Reducing reliance on imported fossil fuels that are likely to become increasingly scarce and expensive—and are already subject to high price fluctuations—will improve energy security and make economies more competitive.

- **Creation of new industries and international competitiveness.** Renewable energy and energy efficiency have become multi-billion dollar industries in some developing countries and are seen as among the most promising future drivers of job growth.

- **The prospect of lower energy prices.** The IEA estimates that in a scenario where countries implement the policies needed to meet global climate objectives, prices for traditional fuels would be lower than under a business-as-usual scenario.[23]

- **Reduced local pollution and improved public health.** Low-carbon energy generation and measures like aforestation and reforestation typically also improve local air and water quality and thus improve human health. This increases the productivity of the workforce and reduces health costs.

Driven by the on-the-ground realities of climate change and additional non-climate benefits, many developing countries in particular are implementing increasingly ambitious policies that advance economic, security, and other environmental interests but also produce substantial reductions in greenhouse gas emissions. Even if countries may be pursuing these policies primarily for their non-climate benefits, because of the greenhouse gas benefits of these policies developing countries are increasingly taking significant climate action. All the major emerging economies and some other leading developing countries already have a mix of policies in place that jointly advance these non-climate and climate objectives. These policies include the following:

- China is pursuing an ambitious program to increase renewable power generation and already has the second-largest wind power capacity in the world. It is implementing comprehensive energy-efficiency measures, including the closure of inefficient factories and implementation of appliance standards. And it is investing heavily in low-carbon transport, including an expansive high-speed rail network. These and other policies already have reduced energy intensity—a measure of energy use per unit of GDP—almost 20 percent below 2005 levels. China has already stated that it does not expect to receive international financing to help meet its climate targets.

- As noted earlier in the report, among other policies India has created a National Solar Mission to expand solar generation capacity to 20 GW by 2022. Additionally, India is reducing fossil fuel subsidies such as those for kerosene.

- Brazil has reduced the deforestation rate in the Amazon by 70 percent from 2004 levels. Brazil's energy sector is also mostly low carbon, relying primarily on hydropower generation.[24]

- South Korea will invest $36 billion over the next five years in developing its renewable energy industries, creating an estimated 110,000 jobs from new exports.[25]

- Mexico has created an ambitious plan for jointly pursuing economic development and reductions in greenhouse gas emissions, and President Calderon has made its implementation a high priority for his administration.

- Among smaller economies, Morocco plans to increase renewable energy to 42 percent of its power generation by 2020, and Costa Rica has developed a plan to make its entire economy carbon neutral.

Among developed countries, the European Union and Japan have also begun pursuing a number of climate-friendly policies:

- The European Union was the first block of countries to introduce carbon pricing and trading at a large scale, covering 40 percent of total emissions. In addition, member states—especially Germany, Spain, Italy, and the United Kingdom—have pursued ambitious renewable energy deployment programs. The European Union also is pursuing comprehensive energy-efficiency measures that include stringent building and vehicle emission standards.

- Japan, which already is the most energy-efficient large economy, is continuing to pursue energy-efficiency programs and is planning to introduce a cap-and-trade system.[26]

Importantly, the world's largest emerging economies all pledged to implement these and other policies (see Figure 1) in the context of the Copenhagen Accord (some of the policies, however, have been announced domestically but not submitted in relation to the Accord). Some countries have pledged or put in place a single economy-wide target for energy intensity or renewable energy deployment, while others made narrower pledges focused on reducing deforestation or improving the efficiency of specific sectors. Some countries included two pledges, one based solely on domestic action and another based on a higher level of effort contingent on receiving international financial support.

FIGURE 1

Overview of Copenhagen Accord pledges

Country	Emissions reduction vs 2020 BAU	Programs
China	• BAU: 14.7 Gt • 12% reduction equivalent to 1,730 Mt abatement	• Increase the share of non-fossil fuels in primary energy consumption by 15% by 2020 • Increase forest coverage by 40 mHa and forest stock volume by 1.3 million cubic metres by 2020 from 2005 • Reduce energy intensity by 20% below 2005 by 2010 • Reduce carbon intensity by 40-45% by 2020 compared to 2005 levels
India	• BAU: 3.2 Gt • Low case: 9% reduction; 287Mt abatement • High case: 20% reduction; 627 Mt abatement	• Install 20 GW capacity by 2020; increase nuclear capacity to 20 GW by 2020; add 15.6 GW hydro capacity by 2012 and create 50 GW new hydro capacity by 2025-26 • Shift to super critical coal capacity • Reduce transmission and distribution losses by 12% by 2030 • Deliver 100% penetration of labelled appliances by 2030; 90% penetration of compact fluorescent lamp program in 2030 • Improve efficiency of agricultural pump by 15% over next 20 years
Indonesia	• BAU: 2.8 Gt • Low case: 26% reduction; 733 Mt • High case: 26-41% reduction; 1,156Mt with international support	• Reduce deforestation rate and land degradation rate, develop carbon sequestration projects in forestry and agriculture, deliver sustainable management of peat land • Promote energy efficiency • Develop alternative and renewable energy sources • Reduce solid and liquid waste • Shift to low emission transportation mode
Brazil	• BAU: 2.7 Gt • Low case: 36% reduction; 974 Mt • High case: 39% reduction; 1,051Mt • Reductions conditional on international financing	• Reduce deforestation in Amazon and Cerrado forest • Restore grazing land, integrate crop-livestock system, deliver direct plantation system and biological nitrogen fixation • Deliver energy efficiency, increase use of biofuels use, expand energy supply by hydropower, build alternative sources • Substitute coal from deforestation with coal from plantations
Mexico	• BAU: 0.9 Gt • Low case: 6% reduction; 51 Mt • High case: 30% reduction; 265Mt • Reductions conditional on international financing	• Adopted Special Climate Change Program in 2009 to take a set of mitigation and adaptation actions in various sectors

Source: UNFCCC submissions; Project Catalyst analysis; Climate Action Tracker

This section has described the reasons some developing countries are pursuing policies with substantial climate benefits, while the next section will discuss how the emissions reductions produced by these policies relate to the achievement of global climate objectives.

III. The Global Gap in Emissions Reduction Ambition

Despite countries' growing appreciation that climate-friendly policies and green growth make sense for purely domestic reasons—and despite pledges of ambitious emissions reduction policies by several major emerging economies—the world is still not on the pathway needed to avoid dangerous climate impacts. More specifically, in Copenhagen in December 2009, world leaders set an overall goal of limiting temperatures increases to 2 degrees Celsius above pre-industrial levels. Even though many scientists consider even this level of warming to entail significant risks of dangerous climate change, the goal will serve to guide national and collective action over the next several years.

The emissions reduction pledges that nations announced during or around the time of the Copenhagen conference were set individually based primarily on nations' perception of self-interest; they are not based strictly on a country's fair share of meeting the global climate objective. As discussed in the last section, some countries announced a variety of policies in and around Copenhagen, which can be classified into low and high scenarios. These terms are used frequently throughout this paper:

- **Low-end Copenhagen pledges** are the low end of possible emissions reduction outcomes produced by actions countries have announced domestically or pledged to implement unconditionally in relation to the Copenhagen Accord.

- **High-end Copenhagen pledges** are the high end of possible emissions reduction outcomes produced by actions countries have announced domestically or pledged to implement conditionally in relation to the Accord. For developing countries, many pledges were conditioned on new and additional international financing. For several developed countries, pledges were conditional on other parties making "comparable efforts" to their own mitigation targets. Other developed-country pledges were conditional on the conclusion of a new global climate treaty.

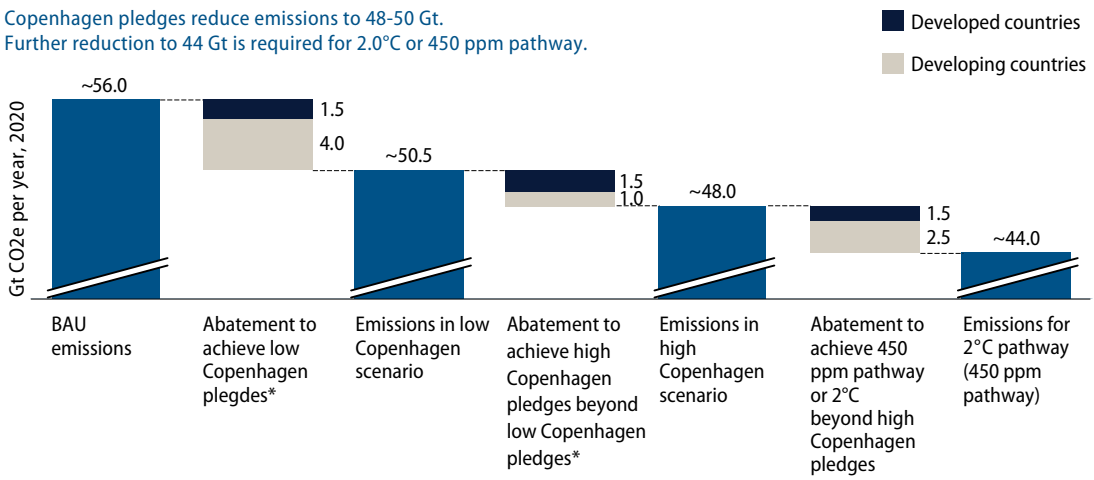
There is a gap between the levels of emissions reductions these policies will produce and the level of reductions needed to meet global climate protection targets. If developed and developing countries were to successfully implement the low end of their Copenhagen Accord pledges, the world would likely face temperature increases of about 3–4 degrees Celsius.[27] A temperature increase on this scale would bring a high probability of irreversible and serious consequences for people and nature, particularly on agriculture and coastal infrastructure. While the poorest and most vulnerable people who have the least capacity to respond would feel these consequences most severely, the United States itself is far from immune.

The difference between business-as-usual emissions in 2020 (56 billion tons of CO_2 equivalent of all greenhouse gases annually) and the levels needed in 2020 to be on a pathway to meeting global objectives (44 billion tons of CO_2 equivalent) will be about 12 billion tons per year in 2020 (see Figure 2). Achieving the low end of the Copenhagen pledges will reduce emissions by about 5.5 billion tons per year below business-as-usual (1.5 billion tons in developed nations and 4.0 billion tons in developing nations).[28]

FIGURE 2

Required emission reductions for 2°C pathway

Global GHG emissions gap to 450 ppm pathway in 2020 (rough estimates)



* Aggregate of individual country pledges in the low (unilateral) and high (conditional) cases; Pledges indicate targets in 2020.

Source: McKinsey Global GHG Abatement Cost Curve v2.1; IEA; US EPA; Houghton; IPCC; OECD; den Elzen; Meinshausen; van Vuuren.

This leaves two gaps: one between the emissions reductions achieved by the low end and high end of Copenhagen pledges, and one between the high end of Copenhagen pledges and the needed reductions to be on the pathway to 2 degrees Celsius. Successfully meeting the higher-end pledges would reduce emissions an additional 2.5 billion tons per year below business-as-usual in 2020 (1.5 billion tons in developed nations and 1.0 billion tons in developing nations). However, this would still leave a gap of about 4 billion tons per year in 2020 (1.5 billion tons in developed nations and 2.5 billion tons in developing nations, based on analysis of least-cost reduction potential) between the high-end pledges and the global objective.[29]

While closing the gap between current pledges and the levels needed for global targets will require greater action by developed countries, there are also substantial opportunities to achieve additional emissions reductions in developing nations. *Indeed, it is highly unlikely that the world will be able to achieve global climate objectives without scaling up efforts to help developing countries reduce their emissions.*

Emissions reduction opportunities in developing nations are distributed across several key economic sectors. Analysts have identified low-carbon power, energy efficiency, and reduced emissions from deforestation through improved land use as opportunities that the world needs to capture in developing nations to be on a pathway in 2020 to meeting global climate objectives.

Low-carbon power

As shown in Figure 3, a total of 700 GW of low-carbon power would need to be built in developing countries by 2020 to achieve a pathway consistent with global climate objectives. Developing countries were set to build about half of that under a business-as-usual scenario, prior to pledges announced in Copenhagen. They would build a further 155 GW under low-end Copenhagen pledges. A total gap of 195 GW remains, 45 GW between low and high Copenhagen pledges and 150 GW between high Copenhagen pledges and the levels needed to meet global climate objectives.

Energy efficiency

As shown in Figure 3, the low end of pledges announced in Copenhagen would produce energy savings equal to 3.8 percent of business-as-usual projections of energy consumption in 2020. These projections envision very substantial

increases in developing-country energy use. Closing the gap with high-end Copenhagen pledges will require increasing savings to about 4.4 percent of consumption, while getting on a pathway to meet global climate objectives will require achieving energy savings of about 7.3 percent of consumption in 2020.

Land use

As shown in Figure 3, while the low end of Copenhagen pledges will produce substantial reductions in deforestation—about 7.5 million acres, or 3 million hectares in 2020—additional action is needed to keep the world on a pathway to meeting global climate objectives. To meet the high-end Copenhagen pledges, countries will need to protect an additional 2.5 million acres (1 million hectares). Getting on the pathway to meeting the global climate objective will require further reductions of about 7.5 million acres (3 million hectares).

FIGURE 3
Changes required by sector

	Power capacity installed from 2010–2020		Energy efficiency, 2020		Forestry, 2020	
BAU	GW of total low carbon power	Low carbon power percent of total BAU capacity	TWh annual energy savings	Savings as percent of total BAU consumption	mHA of avoided deforestation	Percent of total deforested land
Low Copenhagen scenario	350 + 155 = 505	43%	2,250	3.8%	3	21%
High Copenhagen scenario	350 + 200 = 550	47%	2,600	4.4%	4	27%
450 ppm	350 + 350 = 700	60%	4,280	7.3%	7	47%

Source: McKinsey Global GHG Abatement Cost Curve v2.1; Project Catalyst analysis

Overall, while announced emissions reduction pledges will provide a major contribution to achieving global climate objectives if successfully implemented, a substantial gap remains between these reductions and those needed to meet global climate objectives. Closing this gap will require additional action by developed and developing nations. The next section discusses opportunities for helping developing nations increase their level of ambition through the provision of international financing.

IV. The Global Finance Challenge

The mobilization of international financing by developed countries is critical to helping developing nations capture additional emissions reduction opportunities and close the gap between current pledges and global objectives. Many climate solutions are highly capital intensive or more costly than high-carbon alternatives, and developing countries either lack the necessary financing or have chosen to direct scarce resources to other development priorities.

But if investing in low-carbon power, energy efficiency, the protection of tropical forests, and climate-resilient infrastructure and agriculture was as profitable—on a risk-adjusted basis—as other economic opportunities, many developing countries would be willing to pursue climate-friendly policies. Thus, a central part of the climate finance task is reducing the risk and increasing the economic returns of pursuing climate-friendly policies. However, developing countries also need financing to build their capacity and secure technologies needed to implement climate solutions, so providing financing for capacity building, technical assistance, and research and development is also essential.

Some developing countries already have explicitly identified financing as a condition for moving from the low end of the pledges they made in Copenhagen to the high end. For example, Indonesia announced that it would reduce emissions 26 percent by 2020 below business-as-usual levels unilaterally, but up to 41 percent with international support. This represents a gap of about 400 million tons of CO_2 equivalent per year. Because of the role financing plays in international climate negotiations, if developed countries provide international financing, they could help unlock agreement on other issues in the negotiations and meet the conditions developed countries require to move to higher levels of effort (such as transparency provisions).[30]

Many countries structured their pledges this way because sharing the cost of emissions reductions addresses equity concerns between developed and developing countries. Indeed, practically all the countries participating in the international

climate negotiations have spent the last several decades wrestling with complex issues of cost and responsibility—and will no doubt continue to do so for many years to come. Underlying these issues is the fact that while developed nations have a greater historical responsibility for climate change, developing countries are expected to account for nearly all future growth in emissions and are home to the lowest-cost reduction opportunities.

Some progress has been made. For example, in 1992 developed nations, including the United States, agreed they would provide financial assistance to developing countries to support climate action.[31] This type of cost-sharing arrangement has proven successful and cost-effective in other multilateral agreements, such as the Montreal Protocol for phasing out ozone-depleting substances. But the principle that developed countries are responsible to assist in other countries' climate financing has yet to be tested fully on the complex and expensive scale needed to achieve climate safety.

Given that financing is critical for reducing the cost of low-carbon policies and addressing equity concerns, it is unlikely that the world will be able to capture the additional emissions reduction opportunities in developing nations needed to meet global climate targets without international climate financing.

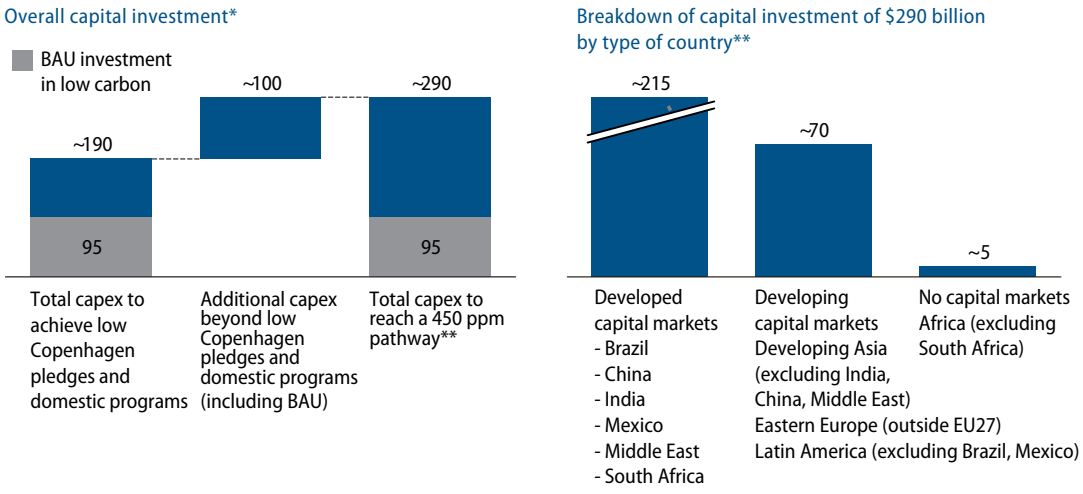
International financing is necessary in the sectors of low-carbon power, energy efficiency, and forests to help countries close the gap between low-end Copenhagen pledges and global climate objectives. Two types of financing are required: capital investment and incremental cost finance, and their distribution varies between emissions reduction sectors.

Capital investment addresses *upfront* financing requirements and typically takes the form of debt, equity, or investment grants. Capital investment either could be on concessional terms mostly from governments and multilateral development banks or commercial terms from these banks or the private sector. Spread across different sectors and groups of countries, overall capital investment of $290 billion per year by 2020 is required to be on the global pathway (see Figure 4). With countries projected to invest $190 billion per year to meet business-as-usual and low-end Copenhagen pledges, an additional $100 billion per year is needed.[32]

FIGURE 4

Overall investment needs

In billions of dollars, 2020



Notes: Excludes adaptation capex and savings from demand reduction/avoided capex

* Is investment in all sectors for green growth technology. For low carbon power, total investment is BAU capital investment ($95 bn) plus additional investment for green tech. for 450 ppm ($195bn). This does not include savings due to demand reduction (~$70bn) and BAU investment in high carbon projects ($120 bn) ** Capital needs in developing world— based on Milken ranking

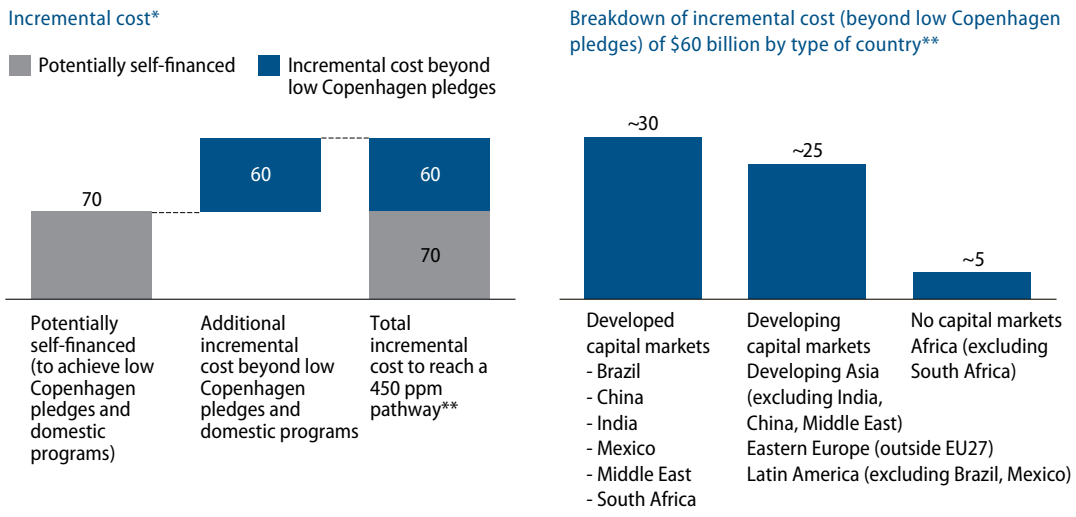
Source: McKinsey Global GHG Abatement Cost Curve v2.1; Capital Access Index by Milken Institute; Project Catalyst analysis

Incremental cost finance addresses *ongoing* financing requirements and essentially takes the form of annual payments to provide the sustained income required to cover the higher costs of low-carbon policies or projects compared to their high-carbon counterparts. Spread across different sectors and countries, overall incremental cost finance of $130 billion per year by 2020 is required to be on the global pathway (see Figure 5 on page 28). With countries potentially covering $70 billion per year of this requirement through policies needed to implement domestic programs and meet the low-end Copenhagen pledges, an additional $60 billion per year is needed.

FIGURE 5

Incremental cost

billions of dollars, 2020



Notes: Excludes adaptation costs

* Includes transaction costs at $4.5/ tonne; $18bn for low Copenhagen pledges and $35 bn for 450 ppm

** Capital needs in developing world based on Milken ranking

SOURCE: McKinsey Global GHG Abatement Cost Curve v2.1; Capital Access Index by Miliken Institute; Project Catalyst analysis

Each emissions reduction sector will require both types of financing, with the largest capital investment needs in the power sector and the largest ongoing financing needs for reducing deforestation. Above these financing needs, developed countries will also need to provide assistance for developing countries to adapt to climate change impacts that are already occurring and expected to occur. Financing needs are divided as follows between different sectors:

Low-carbon power

Although low-carbon energy technologies are becoming increasingly cost competitive, they are often more capital intensive than alternatives. As shown in Figure 6, building low-carbon power requires an estimated $155 billion per year by 2020 to meet global climate targets, tens of billions above levels needed to meet business-as-usual needs and low Copenhagen pledges.

Low-carbon power also will require support for ongoing "incremental" costs through measures such as feed-in tariffs,[33] tax credits, investment grants, or other financial instruments. About $18 billion per year by 2020 is required to cover the

incremental costs of low-carbon energy needed to close the gap between the low-end Copenhagen pledges and global objectives.

To succeed, financing instruments must be tailored to the local situation, and countries must ensure appropriate domestic policies are in place to support investments. In countries with well-developed capital markets, incremental cost financing for a feed-in tariff may be more effective, whereas in poorer countries development banks may need to step in and provide some debt or equity finance to help draw local investors even when projects should be financially viable. In some cases international investors also may need to support local infrastructure, such as electricity grid upgrades.

Energy efficiency

By implementing energy-efficiency measures, countries can benefit from significant savings on energy costs that typically over time far exceed the capital and operating costs of such measures. However, saving energy equal to about 7 percent of business-as-usual consumption will require capital investment of about $123 billion per year by 2020, tens of billions above levels projected to be invested to meet business-as-usual needs and low Copenhagen pledges (see Figure 6). In addition to capital investment, an estimated $18 billion in incremental cost support is needed to cover transaction costs such as energy audits or design and implementation of policy measures.

Since achieving these savings will require millions of individual decisions, such as upgrading a single building, policies and standards are the best way to drive these investments (for buildings, appliances and vehicles). Past experiences have shown that local financial institutions are best placed to provide needed investment capital, and that to succeed, financing must be bundled with information and services like energy audits.[34] Multilateral development banks have significant experience in this type of work, which can be leveraged going forward. For example, the International Finance Corporation's China utility energy-efficiency program leveraged private capital at a ratio of 100:1.[35]

Land use

Activities to reduce emissions in the land use sector may not be in the immediate economic self-interest of countries without international support. This is true in the case of reducing deforestation. The opportunity cost of keeping land forested is often

high when farming or other commercial opportunities are considered. As a result, reducing deforestation will require substantial annual payments in the form of incremental cost finance.

While some countries have started to bring down deforestation rates significantly, additional action is required to meet global climate objectives. According to Project Catalyst analysis, about $24 billion per year is needed to cover the incremental costs of reducing net deforestation and agriculture (see Figure 6). This figure is within the ballpark of estimates from other groups, including the Commission on Climate and Tropical Forests, which relied on a range of models

FIGURE 6
Financing by sector

	Abatement below BAU Gt CO2e, 2020	**Incremental cost beyond low Copenhagen pledges** $ bn, 2020	**Total capital investment including BAU** $ bn, 2020	**Description of financing need**
	■ Developed capital market ■ Developing capital market ■ No capital market			
Power	0.7 0.3 1.0	10 8 .5 ≈18	106 46 2 ≈155	• Financial support to make low carbon technologies commercially viable • Investment capital in countries with limited access to capital markets • Concessional loans, investment grants or subsidies (feed in tariffs) ways to finance power effectively
Energy efficiency/ other measures outside land use and power	2.3 .3 .1 2.7	16 2 1 ≈18	100 20 3 ≈123	• Financial support for countries to design and implement effective policy regimes and to cover incremental cost • Investment capital support in countries with poorly developed capital markets (incl. micro-lending through local financial institutions)
Forestry and land use*	2.1 1.8 0.3 4.2	7 14 4 ≈24	81 ≈12 3	• Financial support for countries to cover the opportunity cost of deforestation / support the transition to alternative development (regular payments linked to reduced rate of deforestation) • Capital investment only required in aforestation and to a lesser extent in agriculture
Adaptation	Adaptation estimates vary widely because of definition of adaptation and hence remains poorly defined			• Financial support for countries to develop adaptation strategies and climate proof specific investments • Concessional lending or investment grants most likely ways to finance

* Includes forestry, agriculture, and waste

Source: McKinsey Global GHG Abatement Cost Curve v2.1; Project Catalyst analysis

and found the costs of halving deforestation by 2020 in the range of $30 billion per year.[36] Investment capital of $12 billion per year is also needed for planting trees on land that has not recently or never been forested and for agriculture, several billion above business-as-usual and low Copenhagen pledge levels.

While some countries, such as Brazil and Indonesia, have made initial deforestation reduction commitments that do not require financial support, the substantial financial flows outlined above will be required to provide incentives for them to increase pledges and for other countries to begin reducing deforestation. In many countries, significant payments will be required to develop and implement programs on the ground, which include measures to establish land titles, enforce laws, and provide alternative livelihoods.

Adaptation

Large questions remain about how to define climate adaptation, and estimates of costs vary widely because of the uncertainty surrounding climate models and the impacts of climate change. Leading global studies estimate costs in the range of tens of billions to more than $100 billion per year (see Figure 7 on page 32). In many countries, adaptation actions will be related to wider development programs and will need to be closely coordinated. Key adaptation measures include investments in flood- and drought-resistant crops, climate-proofing infrastructure (especially in coastal areas), protecting water supplies, developing new disaster response systems, and creating innovative insurance products to cover climate risks.

In some cases, mitigation and adaption funding are one and the same: planting mangroves not only acts as a carbon sink but also reduces flooding, improves the productivity of land, and reduces the need to cut down the forests. Watershed management may increase soil carbon and forest cover, improve water and firewood availability, enhance harvests, and therefore combine mitigation, adaptation, and rural development.

The analysis in this section has revealed that although some countries are taking ambitious actions already as part of their low-end Copenhagen pledges, emissions reduction gaps exist between these pledges, high-end Copenhagen pledges, and the emissions reductions needed to achieve global climate objectives. In addition, this section has shown that based on the current nature of global climate

cooperation, providing international financing for low-carbon power, energy efficiency, and reducing deforestation could be the key to closing these gaps. Hundreds of billions in new capital investment and tens of billions in incremental cost finance will be needed by 2020 to achieve success, along with tens of billions per year in funding for climate change adaptation.

FIGURE 7

Various adaptation cost estimates

	Adaptation cost estimates	Timeframe	Methodology
	Lower bound / Upper bound / Primary research		
UNDP (2007)	86 / 23 / 109	2015	As per World Bank study but includes • Revised "climate proofing" estimates • Costs of adapting poverty reduction strategies to climate change • Costs of strengthening disaster responses
Oxfam (2007)	50 / 50	Present	As per World Bank study but scaled to include • Scaling up of costs of NGO community-based projects • Immediate adaptation needs of developing countries • Other costs that WB ignored (e.g., cost of global public goods etc)
UNFCCC Global estimate (2007)	49 / 122 / 171	2030	Examination of investment and financial flows for adaptation in five sectors: • Infrastructure • Agriculture, forestry and fisheries • Water supply • Human health • Coastal zones
UNFCCC LDCs estimate (2007)	28 / 39 / 67		
World Bank (2010)	70 / 30 / 100	2010–2050	• Analysis of current financial flows (ODA, FDI, GDI) • Estimates exposure of each group of flows to climate risk – "climate sensitive" (40%, 10% and 2-10% respectively) • Estimates cost of "climate-proofing" exposed flows (10-20%)
Frankhauser and Schmidt-Traud (2010)	70 / 30 / 100	2010–2050	Includes 4 sectors: agriculture, disasters, health and coastal zones
Stern review (2007)	4 / 33 / 37	Present	• As per World Bank study but with updated exposure and climate-proofing cost estimates • Specifically, assumes less ODA at risk (20% vs. 40%) and a lower cost to "climate-proof" flows (5-20% range)

Source: Agrawal & Fankhauser (2008); Oxfam briefing paper 04 (2007); IIED; EACC; Project Catalyst analysis

While these sums may seem large, compared to global energy spending of $5 trillion annually, global infrastructure spending of $7 trillion annually, and major economy fossil fuel subsides of $312 billion annually, the capital investment and incremental cost financing needed to close the gap between current developing-country mitigation pledges and emissions reductions needed to meet global targets is quite modest.[37] The next section discusses potential new sources that could address developing countries' climate finance needs.

Box 1: Smart Policies[38]

Before moving to a discussion of potential sources of financing, it is worth noting that new financing alone would not close the gap between what developing nations are doing and what the world needs of them to achieve global climate objectives. New international climate financing needs to be applied in support of smart policies in developing nations. Shifting these nations toward low-carbon development will require policy interventions across the entire economy but particularly in the electric power, energy-efficiency, and land use sectors.

Power sector. In the power sector, smart policies are needed to create the right environment to enable new low-carbon alternatives to compete against old high-carbon approaches. This includes phasing out fossil fuel subsidies, which give high-carbon power an unfair advantage relative to low-carbon alternatives. It includes designing and building the electricity grid in a way that allows renewable energy to be effective—for example, by linking areas of intermittent wind or solar generation to the potential storage capacity of hydrodams. It also includes well-designed support mechanisms, such as feed-in tariffs, renewable standards, tax credits, or investment grants, for renewables where they are not yet competitive. These policies help to reduce uncertainty about the expected rate of return on green energy investments.

This is particularly critical for renewables, which are more capital intensive than their high-carbon alternatives, so financing cost is a major element in their competitiveness. Feed-in tariffs have been a particular success in this regard: they have shown to be able to rapidly develop renewable energy technologies by creating cost certainty and providing a reasonable rate of return for investors. This makes it easier for developers to secure financing. Feed-in tariffs also reduce complexity and transaction costs because developers do not need to negotiate power purchasing agreements with utilities. This allows households and small businesses to install renewable energy, which ensures the investment and the resulting economic benefit stays local. Feed-in tariffs shift the burden of renewable energy development from taxpayers to ratepayers.

Energy efficiency. Performance standards can accelerate progress on energy efficiency very effectively. Building codes, appliance standards, or vehicle standards can be extremely successful at reducing energy consumption, without imposing any cost on public budgets. Often, higher upfront costs are passed on to consumers, who can more than make up for them in energy savings and reduced operating costs. Interventions can also be made in the power sector, such as utility decoupling, which creates incentives for utilities to reduce energy consumption, rather than to stimulate it.

Land use. Land reform and land rights are among the policies that are key to reducing tropical deforestation. Similarly, in agriculture, standards can help to shift behavior toward more sustainable practices. Major policies in this sector are land-titling programs to remove incentives for deforestation as land grab, reduced pressure on primary forests, fire prevention programs, inclusion of explicit environmental considerations in land use zoning and issuance of agriculture and timber concessions, moratoria on development of new, intensive agriculture and timber extraction concessions, and agricultural intensification programs.

V. New Sources of Climate Finance

Based on the preceding analysis, countries have the opportunity to close a substantial portion of the gap between current pledges and global targets by mobilizing new climate finance resources for developing countries in the form of capital investments and grants to cover incremental costs. This section identifies the gap between current sources and overall needs for both capital investment and incremental cost financing, discusses potential new sources, and describes how climate finance discussions could be reframed to resolve accounting issues that undermine existing efforts.

International capital investment for clean energy is about $50 billion per year, provided mostly by the private sector and multilateral development banks. Compared to an estimated need of $290 billion per year by 2020 to put the world on the path to meeting global climate objectives—$100 billion per year more than low-end Copenhagen pledges—these sums are clearly inadequate.

Incremental cost financing for low-carbon power, energy efficiency, land use, and adaptation is currently $11–$13 billion per year. About $10 billion per year is provided in public funding for climate through traditional foreign aid budgets of developed countries, and $1–$3 billion is provided in carbon market offsets. Compared to an estimated need of $130 billion per year by 2020 in incremental cost financing to put the world on the path to meeting global climate objectives—$60 billion per year more than low-end Copenhagen pledges—these sums also are inadequate.[39]

As a down payment, the United States and other nations agreed in Copenhagen to jointly mobilize $100 billion per year from public and private sources by 2020. The international community has just begun the process of substantive and political discussions around different sources of climate finance that they could deploy to meet expected needs and fulfill the 2020 pledge made in Copenhagen. To assist countries in identifying and analyzing sources, the UN Secretary-General convened a High-Level Advisory Group on Climate Change Financing (AGF).

The work of the AGF was intended to complement and help facilitate agreement on financing within the official UN negotiating process and other venues. The UNFCCC process is not yet focused on sources of financing. Instead, it is addressing the deployment of $30 billion in 2010–2012 fast-start financing pledged in Copenhagen and the design of governance for financing delivery mechanisms, including a new multilateral "Green Fund." These will be the primary topics of discussion at the 16th Conference of the Parties to the UNFCCC in Cancun, Mexico.

However, because new sources are so essential to the success of climate finance efforts in the long term—and will need to be discussed in official negotiating processes within the next several years—this report is focused on analyzing new sources. Prior analysts have laid out a long menu of possible options within four groups of finance sources.

Public funding

- **Revenues from carbon markets or carbon pricing.** Countries that have cap-and-trade or carbon-pricing policies could direct some of the revenues from allowance auctions or fees to international climate finance.

- **Fees on international civil aviation and shipping.** Countries could individually or jointly apply fees on fuels used in international civil aviation and shipping, or apply per-ticket fees as a proxy, and direct some of the revenues to international climate finance. This type of fee and redirection makes sense because of the inherently international nature of these industries and the fact that they are not currently covered by any global mitigation efforts.

- **Redirected fossil fuel subsidies or royalty payments.** As agreed to by the G20 in Pittsburgh in 2009, countries have pledged to phase out "inefficient" subsidies for fossil fuels. Additional revenues through eliminating these subsidies could be redirected to international climate finance.

- **Traditional overseas development assistance.** Countries could increase foreign assistance budgets for bilateral or multilateral climate change programs through existing development agencies.

Carbon market finance

- **Carbon market offsets.** Countries that create carbon markets to reduce domestic greenhouse gas emissions could allow regulated entities to achieve a certain percentage of their compliance obligation by investing in emissions reduction programs in developing countries. Countries also could create voluntary offset markets or mechanisms that allow any credits that are purchased to be used in future compliance carbon markets.

Development bank lending

- **Shift in existing lending.** Multilateral development banks could shift existing energy-sector investment from high-carbon energy sources, such as coal, to low-carbon renewable energy and energy efficiency.

- **Increased lending for clean energy.** Countries could provide additional capital for development banks that is then used as collateral for capital investments in renewable energy and energy efficiency.

- **Lending from a fund backed by special drawing rights.** Countries could contribute their special drawing rights, an international reserve currency created by the International Monetary Fund, to a "Green Fund" that uses them as collateral to issue bonds and make capital investments in renewable energy and energy efficiency.[40]

Private capital

- **Risk mitigation instruments.** Countries or international institutions could reduce the risks or increase the returns of clean energy projects relative to high-carbon energy projects. Other analysts have suggested a variety of mechanisms, including loan guarantees, policy insurance, a foreign exchange liquidity facility, a pledge fund, or a subordinated equity fund.[41]

- **Technical assistance and capacity building.** Countries or international institutions could provide technical assistance or capacity building related to specific projects or policy programs in developing countries, overcoming particular barriers to investment and "crowding in" private capital.

Importantly, each of these sources has a particular role to play because of the relationship between specific sources and financing needs. For example, private capital and development bank lending are best suited for debt or equity investments in low-carbon power, or loans to factories or small businesses for energy-efficiency upgrades. Low-carbon power also could require ongoing payments that public financing or carbon markets could provide because they could generate an adequate annual return to offset higher upfront costs. Improving energy efficiency also requires technical assistance and education that public financing could address. To reduce deforestation, most countries or landowners need upfront capacity building *and* annual payments related to the opportunity costs of keeping trees standing. Public funding from bilateral or multilateral institutions could provide the former, while the latter requires ongoing payments, such as those provided by carbon markets or that could be created through public-funding schemes. Most adaptation needs require public funding, but the private sector could cover some of the additional costs by building climate resilience into infrastructure or agriculture project decisions.

Overall, the conclusion of most analysts who have looked at the revenues these different mechanisms could raise is that meeting the $100 billion Copenhagen pledge is challenging but feasible and will require a variety of different sources. The AGF produced one of the most comprehensive analyses of the overall potential from different sources across each of the four categories for low ($15 per ton), medium ($25 per ton) and high ($50 per ton) carbon–price scenarios. As Figure 8 shows, there is no silver bullet. Even with a $50 per ton carbon price and 10 percent of overall revenues directed to international climate financing, countries would not achieve the $100 billion goal. Under a medium carbon–price scenario—the closest to U.S. government analyses of recent cap-and-trade bills—offsets would account for less than half of pledged resources. While private capital appears to have the greatest potential, not all sources should be compared on an apples-to-apples basis, and some are only suitable for certain uses.

FIGURE 8

Overview of sources analyzed by AGF

Billions of dollars, 2020

Sources			Low carbon price ($15/t)	Medium carbon price ($25/t)	High carbon price ($50/t)
Public sources	1. Carbon market revenues	AAU/ETA	2–8	8–38	14–70
		Offset levies	0–1	1–5	3–15
	2. International transport	Maritime	2–6	4–9	8–19
		Aviation	1–2	2–3	3–6
	3. Carbon-related revenues	Carbon tax	~$10 billion for tax of $1/tonne CO2e		
		Wires charge	~$5 billion for tax of $1/tonne CO2e or a charge of $0.0004/kWh		
		Subsidies	~$3–8 billion		
		Royalties	~$10 billion		
	4. Financial transaction tax		~$2 –27 billion		
	5. Direct budget contribution		No clear guidance; estimates from current fast starting funding of $10 billion per year to G77 proposal of 0.5–1% of GDP equivalent to $200–$400 billion		
Development bank instruments	6. MDB contribution		$30–40 billion for each $10 billion paid in capital		
Carbon market finance	7. Carbon market offsets		8–12	38–50	150
Private capital	8. Public/private leverage		Up to $500 billion for medium carbon price around $200 billion		

Source: AGF report

After accounting for political considerations, the AGF estimated the following potential levels of financing raised from different sources (annually by 2020, see Figure 9 on page 40):

- $30 billion from carbon pricing.
- $10 billion from international civil aviation and shipping.
- $10 billion from redirecting fossil fuel subsidies or other innovative sources.
- $30–$40 billion in development bank lending for every $10 billion provided as paid in capital.
- $30–$50 billion from carbon market offsets.
- $100–$200 billion from private capital.

Importantly, global discussions of sources also include a variety of polarizing debates on issues surrounding how to count to the $100 billion pledge. Two of the most important debates are about the relative contributions of public and private sources and how to account for the contribution of sources other than public

funding. These debates are critical because of their implications for how much funding actually was promised in Copenhagen, who will control climate finance, and how to assess whether countries are meeting the $100 billion pledge.

- **The relative contributions of public and private sources.** This debate is primarily ideological and falls along traditional North–South lines. Some developing countries contend that only public funding sources should count toward the $100 billion pledge, and most developed countries argue that all sources should count, including generic private investment and carbon markets. The language in the Copenhagen Accord—which includes "public and private sources"—tends to support the latter interpretation, but the Accord does not specify what should or should not be counted. However, it seems highly unlikely that the vast majority of parties intended to count all or only private investment because this would require only a limited increase in existing flows and would not provide a meaningful contribution to solving the climate problem. Conversely, political and economic realities make it hard to envision how public sources alone will generate the $100 billion. Some combination will be necessary.

- **How to account for sources other than public funding.** This political and technical debate is critical to determine whether countries are meeting the $100 billion pledge and the impact of this funding. For example, if the full face value of private investment is counted, countries could achieve nearly all of the pledge through private financing without directing any resources to adaptation. However, private finance obviously can make a real contribution to climate action in developing countries, and developed countries believe they should receive credit for innovative mechanisms to mobilize private capital.

One option for resolving the latter debate is to consider two definitions for how to count different sources: net and gross (Figure 9 shows gross flows as a bar graph and net flows as a line underneath).[42] **"Gross"** includes the full face value of loans or carbon market offsets, while **"net"** attempts to account for only the marginal benefit received by developing countries from these sources. For public sources, net and gross flows are assumed to be roughly the same. For development bank finance, carbon markets, and private capital, the following approaches are suggested:

- **For development banks,** the OECD Development Assistance Committee has developed a methodology to compare the rates offered by development banks' loans to the rates of loans on private capital markets. About $30–$40 billion in development bank loans produce $11 billion in benefits from more attractive

rates and terms depending on the country, project, and level of loan concessionality—that is, the degree to which the rates charged by lenders are below market interest rates.

- **For carbon markets,** net flows were approximated by an estimate of the "inframarginal" rents of the gross flows—that is, the difference between the purchase price of credits and the actual cost the reductions that generated the credits. About $30–$50 billion in gross flows produce up to $10 billion in net flows.

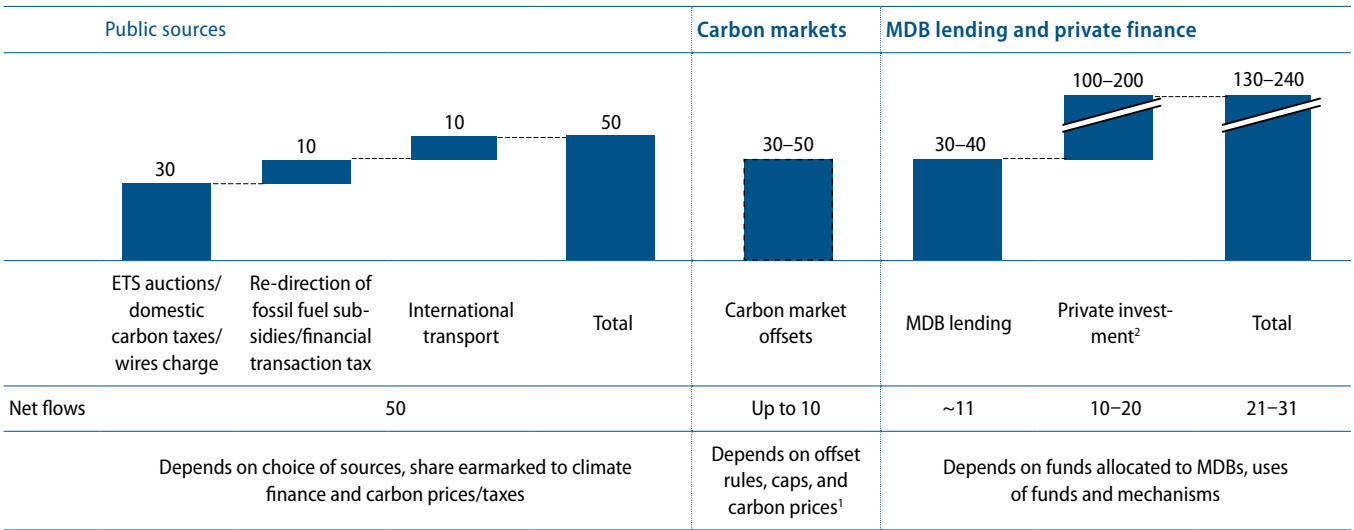
- **For private finance,** net flows are defined as the reduction in the cost of capital produced by co-investments from multilateral development banks or other public finance flows because these investments reduce risk and the cost of capital for developing nations. The implication is that private flows only count when they are mobilized by public capital co-investments. About $100–$200 billion in gross flows is equal to $10–$20 billion in net flows.

Combining the politically realistic—but certainly not easy—levels of gross flows gives a total of $50 billion in public funding, $30–$50 billion in carbon market offsets, and $130–$240 billion in multilateral development bank lending and private investment, for a gross total $210–$340 billion per year by 2020. Combining

FIGURE 9

Overview of sources analyzed by AGF

Billions of dollars, 2020



1 Not counted towards financing needs as carbon finance increases needs proportionally

2 International private finance; excludes domestic private finance

SOURCE: AGF report

net flows gives a total of $50 billion in public funding, up to $10 billion in carbon market funding and $21–$31 billion in multilateral development bank lending and private investment, for a total of $81–$91 billion per year by 2020 (see Figure 9). These overall totals show that reaching $100 billion per year will be challenging using either accounting method but especially under any kind of "net" methodology that only captures the direct benefits of sources besides public funding.

Overall, however, while finding an accurate methodology for calculating the net benefit of sources may be needed in the long term, many complications remain that make this the wrong issue to focus on in the near term:

- Current methodologies are disconnected from the methodologies used to calculate financing needs, which should be the real metric for measuring success. Capital investment needs, for example, are measured as the full face value of loans or private investment, not just the level of concessionality.

- Especially for carbon markets and private finance, determining the rents different actors capture is a challenge because of uncertainty about actual costs of mitigation, leaving estimates with wide ranges.

- For development bank and private loans, countries choose different types of financing for a variety of reasons besides just the strict cost of capital (for example, many countries highly value the World Bank's technical assistance that is often combined with receiving a loan).

- With overall agreement still lacking on whether private sources should count at all, developing and negotiating a methodology for how to count different climate finance sources is likely a bridge too far in the future that could distract from the need to focus on action.

- As discussed previously in this section, different sources have different roles to play in addressing particular needs, and using a methodology that does not account for this fact could leave gaps.

One way to put aside these complications in the near term while working toward a "net" comparison methodology in the longer term would be to create separate goals for each source category: public financing, development bank lending, carbon markets, and private capital. These goals could be based on the estimated need from each source for meeting global climate protection goals. Unpacking the

commitment into the four source categories would allow nations to ensure financing from each type was at the level needed to do the most to solve the climate challenge and focus on implementing urgently needed solutions in each area.

The main messages thus far bear repeating. Overall, while some countries are already taking ambitious climate actions, more needs to be done. A substantial gap exists between the emissions reduction pledges countries announced in Copenhagen and the reductions needed to put the world on a pathway to meeting global climate objectives. Developed and developing nations need to take additional action, including deploying low-carbon power, enacting new policies to increase the efficiency of vehicles, appliances, and buildings; reducing deforestation; and adapting to climate impacts. Developed nations urgently need to provide international climate finance to spur additional action in developing nations and secure effective global climate cooperation. From recent analyses, it is clear that adequate sources are available to meet financial needs, given sufficient political will.

The remainder of this report discusses how the world, and the United States in particular, should begin working toward a collaborative global partnership with developing nations to help them pursue green growth and low-emission development even more ambitiously for the broad range of domestic and international benefits.

VI. Climate Finance 2.0

Despite the urgent need for climate finance and a compelling case for U.S. leadership, the political situation for increasing climate action generally, and financing in particular, remains difficult globally and in the United States.

Globally, climate negotiations are moving slowly, and while parties have begun to make progress on the design of a new climate fund, agreement on sources for financing is still far off. In addition, developing countries are not yet prepared to absorb the full amount of climate finance needed, and developed nations are confronted with serious fiscal problems that make it difficult to advance a discussion that begins with a $100 billion annual price tag.

In the United States, the Obama administration's original plan for international climate finance—a cap-and-trade program with international dimensions—appears politically unlikely in the immediate future. The administration has not yet articulated a viable alternative plan for U.S. leadership on international climate finance through 2020.

However, regardless of the pathway to 2020 the world and the United States choose to follow, success will depend on incremental progress in the near term. Fortunately the United States can take several steps between now and 2015 that would position it for leadership in 2020. Strategies for near-term progress will need to match today's economic and political realities, including continued concern about the economy, high unemployment, and the larger conservative presence in the U.S. Congress that does not support ambitious climate action. The next few pages outline the steps the United States can take internationally and those the administration can pursue collaboratively in the next Congress despite the challenging environment for U.S. leadership.

Many of these recommendations should be pursued through global climate negotiations, but they should not depend on progress in climate talks. These are steps the United States can take alone and with others now, even as global negotia-

tions continue. Indeed, implementing these policies as soon as possible—through bilateral, regional, and multi-country partnerships—would complement and help speed the conclusion of an ambitious global climate agreement.

The United States should work collaboratively with other nations to ensure the following actions happen at the global level:

Deliver on fast-start financing pledges

In the Copenhagen Accord in December 2009, developed countries pledged to provide $30 billion total from 2010–2012 in "new and additional" resources for climate change mitigation and adaptation in developing nations.[43] While it is uncertain whether these resources are truly "new and additional," because the Accord does not define those terms and measurement is difficult, analysts have found that countries are close to meeting the $30 billion objective based on current pledges. The World Resources Institute and Project Catalyst both estimate current pledges at $28 billion, with Project Catalyst estimating a total of $25 billion if the grant-equivalent value of financing is considered.[44] However, some countries have yet to appropriate final funding for fiscal year 2011 or finalize their total pledges for fiscal year 2012. Closing the remaining gap of about $2 billion is essential to helping developing countries take needed actions in the short term while setting the stage for greater investments to come. Countries should aim to increase as much as possible the funds they have not yet appropriated.

Create a new 2013–2015 financing period focused on concrete objectives

With the fast-start pledge, the parties of the Copenhagen Accord started down the road to meeting their 2020 goals with a real and achievable first step. Rather than only treading water for the next years, as a next step toward meeting the climate finance challenge, policymakers should create an interim "ramp-up" investment period from 2013–2015. The financing provided during this new period would achieve real, measurable benefits and provide a solid base for more ambitious action by the end of the decade. A new 2013–2015 period also would provide a more politically relevant time frame for action than the current 2020 pledge and would be less daunting to domestic policymakers than the substantial international flows needed in the longer term.

Rather than structuring this new financing period around the cost of these actions, policymakers could further increase the clarity and viability of this strategy by making the primary focus of the period achieving concrete international climate objectives. Because of the link between different needs and financing sources, leaders should set specific goals for adapting to climate change, reducing deforestation, deploying low-carbon energy, and increasing energy efficiency. In addition, international financing goals should correspond with necessary developing-country actions during the 2013–2015 time period to help place the world on a pathway to meeting globally accepted climate safety goals.

Analysis suggests that achieving the following objectives through 2015 would keep the world on the correct pathway (see Figure 10):

- **For clean power,** the objective of the ramp-up period should be to reduce emissions in the power sector by 400 million tons below business as usual. This is equivalent to building globally an additional 125 GW of low-carbon power—roughly equal to total U.S. renewable energy generating capacity—on top of the business-as-usual construction of 145 GW of low-carbon generation capacity.[45]

- **For energy efficiency,** the objective should be to reduce energy consumption by 2,000 terawatt hours (equivalent to 4 percent of business-as-usual projections for 2015, or about 20 percent of projected growth in non-OECD countries over the next five years[46]), reducing emissions by about 1.4 billion tons below business-as-usual. These goals could be achieved with a comprehensive policy catalogue that includes standards for industrial plants, vehicles and buildings, and programs to phase out incandescent light bulbs and other inefficient technologies.

- **For land use,** the objective should be to reduce deforestation 20 percent by 2015 and achieve reforestation, aforestation and agriculture goals, which would reduce net emissions from land use 2.0 billion tons per year below business-as-usual projections. Achieving this goal will require developing robust pay-for-performance deforestation reduction programs in the major tropical forest nations as well as helping Brazil and Indonesia achieve current objectives and possibly move toward more ambitious ones.

- **For adaptation,** the objective should be to develop national adaptation strategies and agencies to implement them for all the most vulnerable developing countries. Developed countries also should invest in key demonstration activities for new disaster risk–reduction systems, insurance mechanisms, and

climate-resilient infrastructure and agricultural products. These investments will help ensure that by 2015 all developing nations have achieved at least a minimum level of climate readiness. They will also help build institutions and knowledge to guarantee future adaptation needs are effectively and efficiently met.

FIGURE 10

Overview of reduction requirements for 2015

	2015 objectives (beyond BAU)	
	Abatement Gt CO2e	Description
Power	0.4	• Install additional 125 GW of low carbon power on top of BAU additions of 145 GW low carbon
Energy efficiency and process reductions	1.4	• Deliver 2K TWh annual energy savings 4% of BAU • Use process efficiency levers to achieve 0.3 Gt abatement
Forestry and land use	2.0	• Reduce deforestation by 20% equivalent to 3 mHa • Improve agriculture processes for 7% of total agriculture land, ~260 mHa to be improved • Reforest/afforest ~55 mHa land
Adaptation	NA	• Develop national adaptation strategies and national adaptation plan implementing agencies for all of the most vulnerable countries • Invest in key dempnstration activities for various sectors, for example, new disaster risk reduction systems, climate-resilient infrastructure and agricultural products

Source: Global GHG Abatement Cost Curve v2.1; Project Catalyst analysis

Identify the sources needed to achieve these goals, and create a clear process and timeline for delivering them

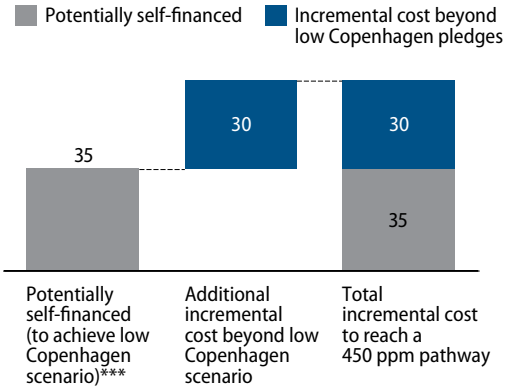
The next three steps after setting indicative mitigation and adaptation goals should be estimating how much financing is needed to achieve these objectives, identifying possible sources of financing, and creating a process and timeline for delivering those sources.

The total international financing needs for achieving the goals described in the previous policy recommendation are an estimated $30 billion per year by 2015 in public or carbon market financing to cover the incremental costs of climate action and $70 billion per year by 2013–2015 in capital investment (see Figure 11). As noted at the outset of the report, these figures assume that developing countries will self-finance domestic actions consistent with the level of effort needed to achieve the low-end of their Copenhagen mitigation pledges.[47] They also do not include adaptation costs, which will require tens of billions in additional funding per year over the time period.

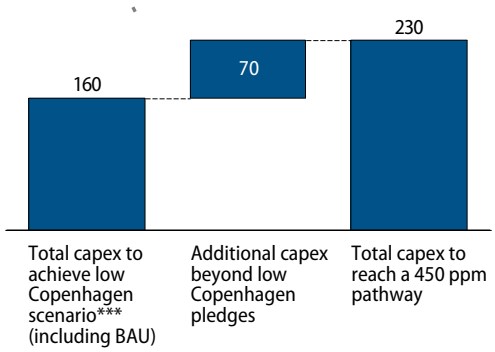
FIGURE 11

Financing support can accelerate the transition to meet 2013–2015 objectives (indicative)

Developing countries will require $30 bn in incremental cost to reach a 450ppm pathway in 2015*



Developing countries will require ~$230 bn in capital investment to reach a 450ppm pathway in 2015**



* Excludes adaptation costs

** Excludes adaptation capex and savings from demand/reduction avoided capex

*** Assumed to be pro-rata based on 2020 targets

Source: Global GHG Abatement Cost Curve v2.1; Project Catalyst analysis

Instead of setting overall financial goals, however, policymakers could set notional targets for each of the four main groups of climate financing sources—public financing, carbon markets, development bank lending, and private financing—linked to the concrete objectives identified in the previous policy recommendation. Setting different goals for each source category also will allow countries to move forward while the world is working out political and technical issues over how to interpret the Copenhagen $100 billion goal. In addition, since specific sources are clearly linked to particular needs, setting distinct objectives for each group of sources will reduce the likelihood that certain mitigation or adaptation needs are neglected.

From public sources, policymakers should aim to ramp up financing from $15 billion in 2013 to $25 billion by 2015 using a combination of new and existing sources (see Table 1). Funding would go toward all of the concrete objectives identified in the previous section. Additional funding will be needed for adaptation and could be provided by direct budget contributions through existing development agencies or new mechanisms.

From carbon markets, policymakers should aim to ramp up financing from $5–$10 billion per year in 2013 to $10–$20 billion per year in 2015 (see Table 1). Funding from carbon markets will need to come primarily from nations that

already have such markets and should go toward a variety of different mitigation measures. This funding could possibly become a leading source of funding to reduce deforestation if countries adopt appropriate domestic laws and carbon market rules.

Through multilateral development banks, such as the World Bank, policymakers should aim to ramp up financing from $10–$15 billion per year in 2013 to $15–$20 billion per year in 2015. From the private sector, policymakers should aim to ramp up financing from $40–$120 billion per year in 2013 to $60–$160 billion per year in 2015 (see Table 1). These capital investments will be directed primarily toward low-carbon power and energy-efficiency programs in developing countries. Public resources will be required to increase the capital available for development bank lending and leverage private capital. New capital, however, should be linked to greening existing development bank lending and grant making, particularly in the energy sector. It would make little sense to promote low emissions development with one hand and undermine it with the other.

TABLE 1

Recommended Financing Objectives from Different Sources for 2013–2015 (in billions)[48]

	2013	2014	2015
Public financing	$15	$20	$25
Carbon markets	$5–$10	$5–$10	$10–$20
Development bank lending	$10–$15	$10–$15	$15–$20
Private financing	$40–$120	$40–$120	$60–$160

To begin making progress toward these ramp-up goals and generate needed financing from different sources, willing nations should consider creating a ramp-up financing process or forum as soon as possible and set a deadline for individual countries to outline how they plan to contribute. Given the short time frame to finalize sources in advance of the start of the ramp-up period, countries would need to launch this process next year and finalize their pledges by the end of 2012. To maximize the chance of success, the process could remain relatively informal and involve only like-minded nations, if necessary.

Diplomatic discussions, for example, could take place in or on the sidelines of a variety of venues, including a continuation of the AGF, the G20, the UNFCCC, an expanded Major Economies Forum, or the UN process leading up to the Rio+20

Earth Summit. Indeed, the ramp-up discussions will be relevant to each of these ongoing processes. Whether countries choose an existing venue or create a new one, however, the process must be broadly inclusive and consensus driven, include an expert analytical support group, and be able to move quickly given the short time frame for action. A natural deadline for the process could be the Rio+20 Earth Summit or the 18th Conference of the Parties in 2012.

However countries decide to structure the process, it should include four elements:

- A general consensus on the need for a 2013–2015 financing period and the desire to create a ramp-up process.
- Clarity on the concrete greenhouse gas reduction goals countries hope to achieve over the time period.
- Analysis of the levels of financing needed to achieve those goals.
- An articulation of how funds will be mobilized, spent, and accounted for.

Give special attention to creating new mechanisms for international transparency to ensure accountability and verify results

Alongside efforts to ramp-up financing from different sources, countries should also work toward greater transparency and accountability in the international climate finance system. Procedures should be built in that allow contributor and recipient countries to easily track financial flows as well as regularly review and evaluate the effectiveness of different financing mechanisms. International transparency also can provide a basis for political consultations on whether particular nations are doing their part.

Despite a challenging political situation for climate action, the United States can make important contributions to this global effort by developing policies that are aligned with broader economic, security, and strategic objectives. While some U.S. contributions will require new financial resources, others will simply require re-aligning existing resources with emerging priorities or taking a more proactive role in advancing global climate cooperation on particular sources of financing. The remainder of this section provides specific policy recommendations for mobilizing U.S. financial investments.

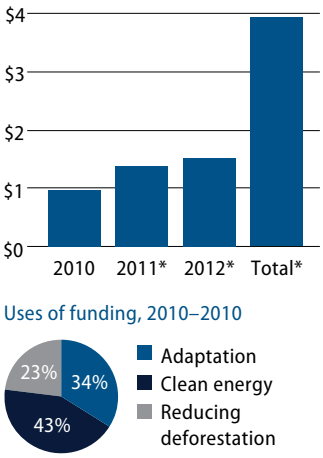
Financially, the United States should contribute to this vital global partnership in the following ways:

Accept responsibility for meeting at least 20 percent of international climate finance needs

Nations have not set country-specific funding goals for the fast-start period. Yet, based on past contributions to multilateral initiatives, the United States should aim to provide about 20 percent of total global international climate funding. This proportion would be consistent with the U.S. share of contributions to multilateral institutions and initiatives, although it is below the U.S. share of historical greenhouse gas emissions. Currently, the United States has about 16.5 percent of World Bank voting shares and the maximum annual assessed contribution for UN dues at 22 percent of annual funding. In addition, the United States provides about 22 percent of total Official Development Assistance and pledged to contribute about 16 percent of funding for the Global Environment Facility's fifth replenishment. The United States accounts for about 29 percent of total historical greenhouse gas emissions. While many developed and developing nations have proposed for that benchmark to dictate funding responsibilities, the United States has opposed this suggestion. Thus, 20 percent represents a reasonable average of past practice and current political pressures.

FIGURE 12

Current U.S. climate finance*



* The graph above only includes international funding where climate benefits are the primary objective.

** Projected

Sources: U.S. State Department, Project Catalyst, World Resources Institute, Climate Advisers

Deliver on U.S. fast-start pledges

The first concrete opportunity for the U.S. to deliver its share of international climate finance is in connection with the fast-start period (see Figure 12). Currently, the United States is only on track to provide about $4 billion in core climate assistance, about $2 billion below its approximate share of about $6 billion.[49] These estimates do not include foreign aid provided primarily for non-climate reasons that may have climate co-benefits. While the United States may have a difficult time closing this entire gap with 2012 funding, it should aim to do as much as possible and keep increasing financing toward greater sums that will be needed in the future.

Assume responsibility for mobilizing the U.S. fair share of international funding for the 2013–2015 ramp-up period

Applying the 20 percent U.S. share figure to the new 2013–2015 ramp-up period reveals that the United States should contribute about $3 billion in public funding for climate change in 2013, increasing to $5 billion by 2015. Specific

contributions to multilateral development bank lending are discussed in the fifth recommendation. While quantifying the United States contribution to mobilizing private financing is more difficult than it is for public funding, adopting a 20 percent goal would provide a needed benchmark against which to measure U.S. private-sector leadership.

Launch country-specific pay-for-performance climate partnerships

Within these overall funding envelopes, the United States should launch three to five major bilateral partnerships to promote climate action in key developing countries, each with financial support in the range of $500 million over three-plus years. These partnerships should focus on supporting the low-carbon development of major economies that are U.S. strategic allies.

Advancing international climate action through country-specific strategic partnerships would help align U.S. climate finance with broader U.S. foreign policy interests and build support for new initiatives in Congress. Adopting a pay-for-performance approach could further increase the political viability of these initiatives. Pay-for-performance measures strictly link financial flows to the achievement of specific objectives—such as a defined reduction in deforestation or deployment of renewable energy—and provide them only after those objectives have been achieved (with some upfront financing to help get started). Such an approach would build on the bipartisan support for the Millennium Challenge Corporation, an international development initiative created under the George W. Bush administration that also seeks to reward nations that adopt good policies and produce real results.

Given their strategic importance to the United States, initial candidates for partner countries could be Indonesia and India.

Indonesia. With the world's largest Muslim population and as a potential economic and strategic partner in Asia, strengthening ties with Indonesia advances a variety of U.S. national interests. In addition, Indonesia has already established a position as a climate leader, as evidenced by its partnership with Norway to reduce deforestation (see Figure 13 on page 52). The Norway–Indonesia partnership is focused on demonstrating the concept of pay-for-performance deforestation reductions in Indonesia while building toward a national program that includes robust institutions and monitoring systems.

FIGURE 13

REDD+ in Indonesia

Context	Financial challenges	Potential deal to finance
• Indonesia possesses 88mHa of forest cover ~46% of country surface area • Indonesia lost 1.2mHa annually (2000–2005)	Financial needs, $bn 2020 • **$20 billion**: Incremental investment (over and above coal)	• REDD+ partnership between Indonesia and Norway – Payments made based on Indonesia's performance compared to BAU
Reasons for action	**Nonfinancial challenges**	**Required enablers**
• Green growth: – Indonesia has pledged 26% reduction in BAU emissions by 2020 – Opportunity to reduce 2.3 Gt by 2030 equivalent to 45% of 2005 emissions by 2030 from which 574 Mt is by avoiding deforestation	• Lack of alignment with private players, companies that make money either from cutting/selling timber or using the deforested land • Lack of capabilities to implement on a large scale • Lack of fully functional MRV system to track performance • High geogrpahical differences and susceptibility to natural disasters	• Clear ownership/accountability for green growth • Performance management tracking to ensure clear measurement against BAU and hence flow of funds

Source: Interviews, Project Catalyst

During President Obama's recent visit to Indonesia, he and President Yudhoyono established a new "Comprehensive Partnership," agreed that it was "timely and appropriate to elevate this strategic relationship to a higher level," and expressed a "desire to increase consultation and cooperation, reflecting warmer ties, significant shared interests, and a belief that partnership is critical not only to the bilateral relationship, but to addressing key regional and global challenges."

The two leaders also "reaffirmed their strong commitment to combat climate change, including finding creative ways to support the new Norway–Indonesia … partnership."[50] Indeed, the United States has already signaled that some of the funding from a new Millennium Challenge Corporation compact with Indonesia could be directed toward deforestation reduction programs. The United States could choose a specific aspect of building Indonesia's deforestation reduction program to focus on—such as measurement, reporting, and verification systems—and pledge a certain amount of funding for each ton of greenhouse gas emissions Indonesia reduces in its forest sector. Indonesia and contributor countries could agree on a business-as-usual rate of deforestation (known as a "baseline") against which to measure reductions.

India. Strengthening ties with India is not only desirable because it is the world's largest democracy, but also because the country plays a critical role in achieving regional security objectives in Asia. It also could drive substantial job creation in the United States because of its status as a source of foreign direct investment and a lucrative market for U.S. exports. During President Obama's recent visit to India, he and Prime Minister Singh "reaffirmed that [the] India–U.S. strategic partner-

ship is indispensable not only for their two countries but also for global stability and prosperity in the 21st century," and stated that India and the United States "have a natural partnership for enhancing mutual prosperity and stimulating global economic recovery and growth."[51]

With regard to energy and climate change, India is facing climate challenges both in reducing its rapidly growing emissions from the energy sector and protecting coastal cities and vulnerable people from the impacts of climate change. While the United States and India recently announced the creation of a new clean energy research center and a partnership to study shale gas, among other technologies, greater cooperation is needed to accelerate India's mitigation and adaptation efforts. A mitigation partnership could focus on supporting the implementation of India's National Solar Mission, while an adaptation partnership could focus on creating comprehensive adaptation strategies for the country's most vulnerable areas.

Other possible partners for the United States could include Mexico, Colombia, South Africa, and Brazil. Each of these nations is a major regional ally of the United States. Each nation also has made climate change and green growth a focus of its development objectives.

Increase the resources of development banks for clean energy lending

The World Bank is currently undertaking a comprehensive review of its energy-sector lending strategy. While lending for renewable energy and energy efficiency has increased in recent years, so has lending for large-scale coal power plants that are typically justified as the least-cost option for delivering energy access in developing nations. The United States and many other developed countries appear to support a transition away from fossil fuel lending for at least the major emerging economies and recently expressed this opinion by abstaining from a vote on a loan for a large South African coal plant that ended up passing. Developing countries countered by saying that they could accept stricter conditions on coal lending if developed countries were willing to provide additional financing to cover the higher costs of renewable energy and energy efficiency. The outcome of the energy strategy review is especially important because the World Bank wants to play a large role in the provision of climate finance.[52]

Therefore, as a fifth U.S. contribution to global climate action in the 2013–2015 time period, the United States should continue to work with developing countries, international financial institutions, and other donor countries to increase inter-

national development bank lending resources for climate finance, specifically for renewable energy and energy efficiency. Providing additional capital to multilateral development banks for a new innovative energy finance window or facility could accomplish this. This additional investment capital could be conditioned on development banks placing much stricter conditions on coal lending and shifting existing lending for coal and other fossil fuels to renewables and efficiency.

With a roughly 30–40 percent ratio of equity to outstanding loans and a target of about $15 billion in annual clean energy lending by 2015, contributor countries will need to provide $3–$4 billion in additional paid-in capital to development banks. If the U.S. were to contribute 20 percent of this effort, it would need to provide $600–$800 million in new funding over the period of several years. The United States could raise this funding from existing public resources or innovative sources, such as aviation fees, shipping fees, or the phase-out of harmful subsidies for fossil fuels. While the World Bank's ongoing energy-sector review provides an immediate opportunity for a political deal, other regional development banks such as the Asian Development Bank that have taken steps to increase lending for renewables and efficiency could receive additional capital if they adopt similar conditions for coal lending.

Work internationally to coordinate efforts to reduce emissions from international aviation and shipping in ways that mobilize resources for international climate finance

Due to growing greenhouse gas emissions from international civil aviation and shipping, U.S. airlines and shipping companies are facing impending regulations on their efficiency and greenhouse gas output from a variety of different venues. Although there is an ongoing legal challenge, the EU Emissions Trading Scheme is set to begin regulating emissions from transatlantic flights by U.S. airlines beginning in 2013, and the European Union is committed to take regional action to cut shipping emissions if global negotiations prove too slow. In addition, independent negotiations in the International Civil Aviation Organization and International Maritime Organization are moving, albeit slowly, toward agreements to regulate emissions from cross-border shipping and aviation.

Many industry groups in the United States, Canada, and Mexico see aviation regulations as inequitable because they are applied unilaterally, could disproportionately harm U.S. carriers, and benefits—including financing raised from the

regulations—would go back to the European Union. The EU regulations do stipulate, however, that if a third country takes "equivalent action," flights from that country to the European Union will be remitted from the EU Emissions Trading Scheme. Since regulations appear highly likely, if not inevitable, proactively developing a system that meets the "equivalent action" criteria may prove the best way for the United States to ensure that U.S. carriers are treated fairly and U.S. taxpayers, carriers, and consumers derive benefits from measures to reduce emissions from aviation. To address competitiveness concerns, a proactive approach should aim to reach agreement among all key countries, with a smaller group agreement, a bilateral pact with Europe and unilateral U.S. measures as fall-backs if necessary to advance U.S. economic and environmental interests.

For shipping, the United States should continue working with other nations to agree on a global approach to reduce emissions while actively seeking compromises to ensure the system generates revenue for international climate financing. Competitiveness concerns unique to the shipping industry and the current status of international negotiations on emissions from shipping make it more necessary to pursue a truly global approach compared to aviation.

Generating new revenues is critical to help modernize the aviation and shipping industries, update aging U.S. infrastructure (such as air traffic control systems and ports), and support international climate programs. U.S. aviation emissions from so-called bunker fuels have averaged about 129 million metric tons per year over the last three years.[53] Applying a fee of about $20 per ton would generate $2.6 billion per year in financing, and directing 25–50 percent of this financing toward international climate programs would provide about $0.5–1.3 billion per year in additional resources.

Further study is needed to figure out how such a system could be implemented in a manner that gains U.S. industry support, preserves U.S. jobs, and helps achieve climate goals. The one thing we cannot afford to do, however, is take a passive approach to bunker fuel policy. The economic and environmental stakes are too high.

VII. Conclusion

While developing and developed countries have begun taking substantial measures to reduce their greenhouse gas emissions, often for non-climate reasons, a large gap exists between the reductions these measures achieve and the reductions needed to limit global temperature increases to 2 degrees Celsius. To close this gap, developed and developing nations need to make additional reductions. Developing nations are unlikely to achieve these reductions with international financing to support the deployment of low-carbon power, increases in energy efficiency, and reductions in deforestation.

There is a strong case for U.S.—and indeed global—leadership to mobilize and deliver international climate finance from economic, national security, strategic, and environmental perspectives. Climate finance can help create new industries and reduce fossil fuel prices, protect vulnerable states from destabilizing climate impacts, strengthen ties with strategically important major emerging economies, and limit the potentially dire consequences of climate change for the United States.

Overall, developing nations need about $60 billion per year by 2020 in additional incremental cost finance and $100 billion per year by 2020 in additional capital investment to close the gap between their current policies and reduction levels that could help put the world on a pathway to 2 degrees Celsius. Tens of billions in additional financing is needed each year for adaptation. Developed countries would not only derive many benefits from providing this financing, but they also have a responsibility because of cost-sharing principles in international climate agreements.

A variety of financing sources are available that generally fall into four groups: public, carbon markets, development banks, and private financing. Collectively, these groups of sources have the potential to generate sufficient incremental cost financing and capital investment to close the emissions gap, given substantial political will. Because of difficulties comparing different sources and the relationship between different sources and particular uses, countries would have a much easier time measuring success if they disaggregated global financing objectives into goals for specific sources.

To capture these benefits, in light of political realities, both the international community and the United States need new strategies. Globally, countries should deliver on 2010–2012 fast-start financing pledges and establish a new 2013–2015 ramp-up financing period focused on concrete objectives for mitigation and adaptation. Countries then should identify sources of financing needed to achieve these objectives, launch a process to mobilize those sources, and set a deadline for countries to announce their contributions.

The United States should contribute to this global effort in six ways: accepting responsibility for 20 percent of global financing efforts, delivering its share of fast-start financing, helping create and lead the coalition that drives the concept of the ramp-up period, establishing new bilateral climate partnerships with key strategic allies, working to "green" multilateral development bank lending by providing additional capital to cover the higher costs of clean technology, and taking a proactive approach to regulating emissions from international civil aviation and shipping in a way that generates international climate financing.

If it takes these steps, the United States can still play a constructive and meaningful role in accelerating global climate action by leading an enhanced mobilization of international climate finance.

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29 While the results of our analysis are similar to those achieved by the United Nations Environment Programme's (UNEP) recent *Emissions Gap Report*, they differ in several ways. The UNEP report has four scenarios for the achievement of conditional or unconditional mitigation pledges and the application of strict or lenient rules for land use and offset accounting. Our report's analysis, on the other hand, has two scenarios based on the low and high ends of the possible emissions reduction outcomes produced by the policies countries are planning to implement and the pledges made in and around Copenhagen. See UNEP, *The Emissions Gap Report* (Nairobi, Kenya, 2010).

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49 Estimates provided by the U.S. State Department show higher totals because they include development assistance where climate benefits are not the primary objective and financing provided by export credit agencies for climate-related projects. While these programs should be encouraged, we have chosen not to count them because providing climate benefits is not their primary objective. Including this funding brings the fiscal year 2010 total to $1.7 billion. See: http://paei.state.gov/g/oes/rls/rpts/faststart/index.htm

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About This Report and Acknowledgements

This report was a collaboration of the Alliance for Climate Protection and the Center for American Progress based on analysis provided by Climate Advisers and Project Catalyst. Project Catalyst is an initiative of the ClimateWorks Foundation. The views in this report are solely those of the authors.

This report on U.S. policy complements a global analysis on climate finance released by Project Catalyst in November 2010. While the reports share the same analytic and economic modeling framework, the findings and recommendations of each report are separate and not necessarily endorsed by the authors of the other report or their institutions.

The authors of this report would like to thank Angela Anderson, Kevin Curtis, and Kalee Kreider for providing valuable strategic input throughout the drafting process. We are especially grateful to Leon Fuerth for making the case early and often that planning for climate change must integrate project design and finance on a global scale, and for suggesting ways in which this could be done. The authors also wish to express gratitude to Emily Werner and Katie Parsons of the Alliance for Climate Protection and Lisbeth Kaufman of the Center for American Progress for their assistance with research, drafting, editing, and design of the report. We also would like to thank Sarah Aldy for her excellent work editing the report and Peter Lockley for providing helpful comments on our bunker fuels recommendation.

The authors are grateful for support provided by the Energy Foundation.

About the Alliance for Climate Protection

The Alliance for Climate Protection was founded in 2006 by Al Gore, Nobel laureate and former Vice President of the United States. With more than five million members and supporters worldwide, the Alliance is a unique nonprofit, nonpartisan organization committed to educating the global community about the urgency of implementing comprehensive solutions to the climate crisis.

About the Center for American Progress

The Center for American Progress is a nonpartisan research and educational institute dedicated to promoting a strong, just and free America that ensures opportunity for all. We believe that Americans are bound together by a common commitment to these values and we aspire to ensure that our national policies reflect these values. We work to find progressive and pragmatic solutions to significant domestic and international problems and develop policy proposals that foster a government that is "of the people, by the people, and for the people."

About Climate Advisers

Climate Advisers is a consulting firm specializing in U.S. climate change policy, international climate cooperation, global carbon markets, and climate-related forest conservation. Climate Advisers develops and advances environmentally effective, economically affordable and politically realistic climate change policies, strategies, and investments.

About Project Catalyst

Project Catalyst is an initiative of the ClimateWorks Foundation. ClimateWorks is a global, non-profit philanthropic foundation headquartered in San Francisco, California with a network of affiliated foundations in China, India, the US and the European Union. Project Catalyst was launched in May 2008 to provide analytical and policy support for stakeholders engaged in the United Nations Framework Convention on Climate Change (UNFCCC) negotiations.

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