Center for American Progress

UNITED NATIONS FOUNDATION

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Meeting the Climate Challenge

Core Elements of an Effective Response to Climate Change

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Meeting the Climate Challenge

Core Elements of an Effective Response to Climate Change

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Introduction

Achievable gains in energy efficiency, renewable energy, forest conservation, and sustainable land use worldwide could achieve up to 75 percent of needed global emissions reductions in 2020 at a net savings of $14 billion. These actions, along with additional investments in climate adaptation, would deliver a wide range of economic, security, and environmental benefits in developed and developing countries. Greater international support for these core elements would make an immediate contribution to solving the climate problem and help to achieve a new international climate agreement.

Background

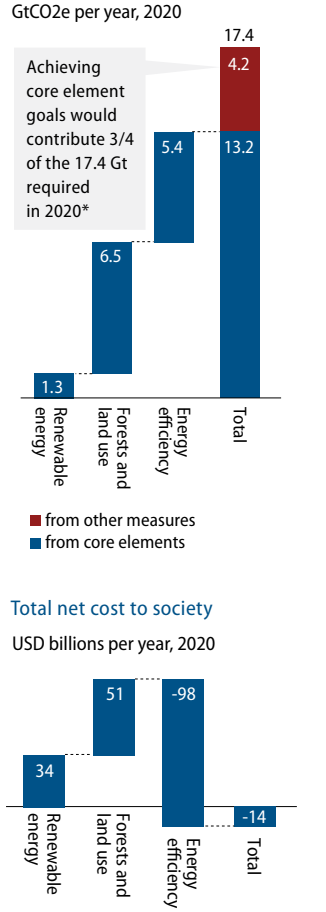
Negotiations toward a new global agreement on climate change have entered a critical stage. Parties to the U.N. Framework Convention on Climate Change will gather in Copenhagen in December to seek agreement on a new international regime to take effect after the Kyoto Protocol's first commitment period ends in 2012. Leaders at this summer's G-8 Summit agreed that global average temperature should rise by no more than 2 degrees Celsius above preindustrial levels and that global greenhouse gas emissions must be reduced 50 percent by 2050 to accomplish this goal.[1] Nearly 100 world leaders joined the U.N. Secretary-General for a Summit on Climate Change in September to underscore the urgency of completing a new agreement. CEOs of private sector companies and nongovernmental organizations from around the world joined this call for action.

A new agreement must include:

1. Ambitious emissions reduction targets by developed countries
2. Nationally appropriate mitigation actions by developing countries to advance low-carbon development
3. New and additional financial assistance from developed countries to developing countries
4. Mechanisms for technology cooperation with developing countries

The negotiations are challenging. Among developed countries, the United States has not offered a near-term emissions reduction target, and legislation that would support such a target is still under debate in Congress. China, India, and other developing countries have

Figure 1. Achievable gains could save 13.2 GtCO2e of emissions while generating an in-year net benefit of $14 billion per year by 2020



* 17.4Gt of abatement is required in 2020 to achieve a 450 ppm pathway, which has a 40-60 pecent probability of limiting temperature increases to 2oC

Source: Project Catalyst analysis; exchange rate assumption of 1.27 USD = 1 EUR

announced low-carbon growth initiatives in their national plans and policies, but they are not prepared to accept internationally binding obligations.[2] Countries have proposed needs and institutional options for financing and technology cooperation, but these have not been negotiated.[3]

It is important to remember that the underlying policies and measures that will deliver emissions reductions and low-carbon growth most effectively are attractive in their own right and can be undertaken immediately. This paper assesses four core elements of an effective global response to climate change: energy efficiency, renewable energy, forest conservation and sustainable land use, and adaptation. We focus on these areas because they can deliver the most immediate response to climate change while also advancing other economic, security, and environmental objectives. Achievable gains across all nations in the first three of these areas could achieve up to 75 percent of needed emissions reductions in 2020 at a net savings of $14 billion, based on analysis done for the United Nations Foundation by Project Catalyst (see Figure 1).[4] These actions, along with additional investments in adaptation, can help developed and developing countries alike address a variety of strategic interests, including sustainable development and job creation, energy security and energy access, food security and improved rural livelihoods, and environmental quality and public health.

Increased international support for these core elements would make an immediate contribution to solving the climate problem and provide a valuable foundation for a new international climate agreement.

Energy efficiency

Energy efficiency is the most immediate and cost-effective opportunity to reduce global greenhouse gas emissions. A recent assessment by Project Catalyst concluded that improving energy efficiency could provide roughly one-third of available, cost-effective emissions reductions in 2020.[5] It is one of the few large-scale mitigation options that yields a positive economic return while providing a wide range of other social, environmental, and security benefits. Energy efficiency is attractive in all nations and especially in developing countries because it allows existing energy sources to serve a larger population and facilitates universal access to modern energy services—a key requirement for poverty reduction and sustainable development. A study by the McKinsey Global Institute determined that profitable investments in energy efficiency through 2020 could cut global energy demand growth in half.[6]

Nineteen U.S. states have set energy efficiency resource standards,[7] and a national efficiency resource standard is now under consideration in Congress. The EU has set a target of cutting energy demand 20 percent by 2020, and China has a target of reducing its energy intensity—the ratio of energy use to economic output—by 20 percent in five years.[8] And leaders at the G-20 Summit in September pledged to phase out fossil fuel subsidies, which would lead to additional energy efficiency improvements in their countries as consumers and business respond to resulting increases in energy prices.[9] (See box on p. 10 for additional examples.)

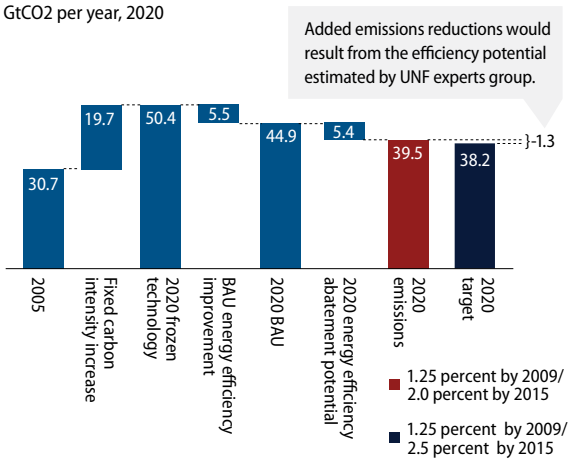
Yet energy efficiency faces an array of market barriers that currently inhibit full deployment,[10] and raising energy prices alone—whether by reducing fossil subsidies or causing energy producers to buy CO2 emissions permits or pay carbon taxes—will not be sufficient to overcome these well documented obstacles. Many countries have implemented innovative and effective policies to increase deployment of energy efficiency, such as building codes, appliance standards,

Figure 2. Raising annual energy efficiency gains to 2 percent by 2015 could save 5.4 GtCO2e of emissions

Meeting a goal of 2.5 percent would yield added savings

Global greenhouse gas emissions of consuming sectors (industry, buildings, transport)

GtCO2 per year, 2020



Source: Project Catalyst analysis

and regulatory incentives for utilities to finance end-use efficiency improvements. These and other policies recommended by the International Energy Agency could rapidly accelerate progress on energy efficiency if applied throughout the developed and emerging market economies.[11]

Energy efficiency is currently improving globally at a rate of 1.25 percent per year, as measured by declines in energy intensity.[12] Analysis done by Project Catalyst for this report shows that increasing this rate to 2.0 percent by 2015 would reduce emissions by 12 percent below business as usual in 2020, or 5.4 billion tons of carbon dioxide equivalent (GtCO2e), and would yield a net savings in 2020 of $98 billion. Analysis by a UNF-convened expert group suggests that a more ambitious goal of doubling the rate of improvement to 2.5 percent in major economies is achievable and would yield greater benefits (See Figures 1 and 2).[13]

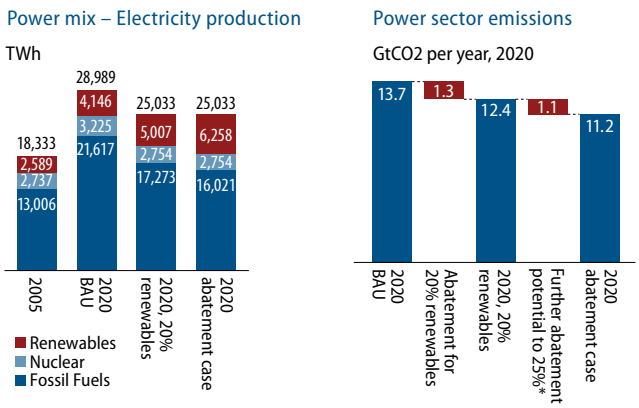
Renewable energy

The world must address climate change in the face of another pressing global challenge: energy poverty. Approximately 2.5 billion people have little or no access to modern energy services, which are essential for economic development and poverty reduction.[14] Reducing greenhouse gas emissions while extending energy access will require a transformation of the world's energy economy. A wide range of low-carbon energy sources and technologies must be harnessed, including natural gas, wind, solar, biomass, geothermal, hydro, and nuclear, as well as new technologies to reduce and sequester emissions from coal and other fossil fuels.

Renewable energy technologies are the most compelling alternatives to fossil fuels in the long run, as they rely on inexhaustible, domestic resources; they are environmentally friendly if appropriately sited and designed; and their production can create domestic economic development and jobs in all countries. Renewable energy is constrained in the short to medium term because it is generally more expensive than competing—and often subsidized—fossil alternatives.[15] Yet these prices are falling and are competitive with fossil fuels in some cases such as wind and solar applications off the grid.[16] And G-20 leaders' pledge to phase out fossil fuel subsidies, if implemented, will help to make renewable energy technologies more economically attractive by raising the price of fossil alternatives.[17]

Renewable sources provide about 13 percent of global energy, mainly from fuelwood and other biomass sources.[18] The European Union has set a target of obtaining 20 percent of its energy from renewable sources by 2020.[19] China has set a target of 15 percent by 2020.[20] More than half the U.S. states have adopted renewable electricity standards that require increased use of wind, solar, geothermal, and bioenergy.[21] The U.S. Congress is considering a national renewable electricity standard that would require all states to derive 20 percent of their electricity from renewable sources by 2020, although some of that target could be met through increased energy efficiency.[22] (See box on p. 10 for additional examples.)

Figure 3. Increasing renewable energy to 20% of global supply by 2020 could save 1.3 GtCO2e of emissions
A higher share with added savings is feasible



* This corresponds to the full cost curve abatement case of 19Gt of abatement below €60/t ($76/t)

Source: McKinsey Global GHG Abatement Cost Curve v2.0, Project Catalyst analysis

The costs of renewable energy technologies are declining as technologies improve and larger volumes of production allow for greater efficiencies in manufacturing. Additional national performance standards that create larger-scale markets will accelerate this process even further. Still, the higher cost of renewables compared to fossil energy sources constrains private investment and limits the market share of renewable energy, especially in developing countries. Policy incentives are needed to develop and deploy renewable energy technologies at a much greater scale to accelerate innovation and reduce costs.

A global goal of providing universal access to modern energy services and deriving 20 percent of the world's electricity from renewable sources by 2020 would help meet the challenges of climate change and energy access for the poor at the same time. Analysis by Project Catalyst done for this report indicates that achieving this renewable energy goal would reduce emissions in 2020 by 10 percent below business as usual, 1.3 GtCO2e, at a net cost in 2020 of $34 billion (See Figures 1 and 3).

Forest conservation and sustainable land use

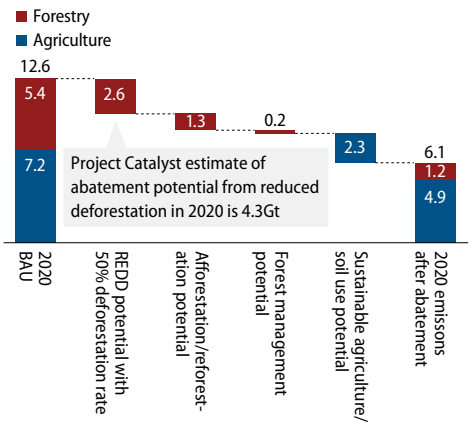
Tropical deforestation produces over 17 percent of global CO2 emissions. Agriculture and livestock generate another 14 percent.[23] Taken together, these land uses and land use changes account for nearly one-third of all emissions. We cannot hold greenhouse gases to safe levels in the atmosphere unless developed and developing countries reduce deforestation, adopt sustainable agricultural practices, and restore vegetation on degraded lands.

These low-cost carbon mitigation strategies also provide compelling social and economic benefits. Protecting and restoring healthy natural habitats provides people with a range of valuable services, including fresh water, fertile soils, crop pollination, pest control, flood prevention, food and fiber, recreation, and tourism revenue. Sustainable practices for low-carbon forestry, agriculture, and livestock management can boost farm productivity and rural incomes, enhance soil health, conserve water, save energy, reduce pollution and runoff, and stimulate economic development, job creation, poverty reduction, and food security. Sustainable land management is also an important strategy for adaptation to climate change, as healthy ecosystems protect watersheds, maintain regional weather patterns, and provide a buffer from extreme weather events caused by climate change.

Figure 4. Forest conservation and other measures could reduce forestry and agriculture emissions by 50% (6.5 GtCO2e) in 2020

Global GHG emissions Forestry and Agriculture

GtCO2e per year, 2020



Source: Project Catalyst analysis

Yet few of these good conservation practices make economic sense in today's marketplace. Ecosystem services are rarely valued in the market, which means that forests, wetlands, coral reefs, and other natural habitats are often worth more dead than alive. Sustainable forestry and farming practices that can help preserve healthy ecosystems while reducing greenhouse gas emissions—such as low-impact logging, enhancing soil carbon, or applying fertilizers and pesticides more sparingly—can entail added first costs, require training, or face other barriers that limit their uptake.[24] National policy commitments, targeted financial incentives, and extension services to landowners and communities are needed to scale up sustainable land management in both developed and developing countries.

Some countries are beginning to act. Brazil, for example, has announced a national plan to reduce deforestation by 80 percent below recent levels by 2020.[25] Several developed countries have made commitments to increase funding for tropical forest conservation, most notably Norway, which has pledged up to $500 million annually.[26] (See box on p. 10 for additional examples.)

Developing countries could feasibly use these programs to reduce the annual rate of tropical deforestation 50 percent by 2020,[27] and all countries could significantly increase the amount of land under sustainable management though habitat restoration, and sustainable forestry, agriculture, and livestock practices. Analysis by Project Catalyst done for this report shows that these improvements would reduce emissions in 2020 by over 50 percent from business as usual, 6.5 GtCO2e, at a net cost in 2020 of $51 billion (See Figures 1 and 4).

Adaptation

The U.N. Intergovernmental Panel on Climate Change's latest assessment report concluded that climate change is already under way and that developing countries, especially in Africa, are most vulnerable to its early effects, including droughts, floods, water shortages, more intense tropical storms, increased disease ranges, decreased agricultural output, coral bleaching, and more.[28] A new global climate agreement must offer significantly more resources to developing countries to plan and implement adaptation measures. Several adaptation funds have been established, at the World Bank and U.N. Development Programme as well as under the U.N. Framework Convention on Climate Change itself. These funds have yet to mobilize significant resources, however, which has created tension between developed and developing countries in the current negotiations.

Developed countries should contribute $1 to 2 billion over the next three years, 2010-2012, to implement the National Adaptation Programs of Action for the least developed and most vulnerable countries in the context of their poverty reduction strategies.[29] Donors should give preference in distribution of the funds to community-level organizations and NGOs to enhance local resilience in the context of sustainable development, and support village and rural populations' access to infrastructure, renewable energy, education, health care, and ecosystem conservation—all designed taking into account the likely impacts of climate change. The funds provided should be new and additional to existing aid commitments. These funds would be focused on reducing vulnerability and providing the planning and additional investments necessary to adapt national development programs to the expected impacts of climate change. The funds could be provided as a special window in the Global Environment Facility with a modified governance structure that balances developing and developed country interests. Its funding would be additional to GEF's fifth funding replenishment, which is now being negotiated.

National strategies

Developed and developing countries alike are putting in place national policies for energy efficiency, renewable energy, forest conservation and sustainable land use, and adaptation assistance that meet and even exceed the goals recommended in this paper.

China has launched an ambitious program to improve energy efficiency and plans to reduce energy intensity by 20 percent from 2005 levels by 2010, which exceeds the goal we identify in this paper. China has also embarked on a program to increase the use of nonfossil energy as a proportion of total primary energy to 10 percent by 2010 and 15 percent by 2020. This includes installation of 100-150 GW of wind power capacity, 10 GW of solar power capacity, 300 GW of hydropower capacity, and 86 GW of nuclear capacity, all by 2020. During the U.N. Summit on Climate Change in September, President Hu Jintao announced that China would adopt a carbon intensity target with an unspecified but significant reduction envisioned for 2020. President Hu also reaffirmed his commitment to increase China's forest cover to 20 percent by 2010 and 26 percent by 2020.

The European Union has pledged to reduce emissions 20 percent below 1990 levels by 2020. With a "comparable" effort by the United States, the EU would increase their goal to 30 percent. The EU has set targets to reduce energy consumption 20 percent below projected levels in 2020 and to increase renewable energy to 20 percent of its overall energy mix by 2020, including a minimum of 10 percent biofuels in overall fuel consumption. Internationally, EU member states are providing bilateral assistance for forest conservation, clean-energy development, and adaptation. While Europe's Emissions Trading System excludes support for international forest conservation, this may change after 2012, especially if a new international climate agreement includes provisions on Reducing Emissions from Deforestation and Forest Degradation.

India's current five year plan seeks to cut energy intensity 20 percent between 2007 and 2012 and increase renewable energy to between 14 and 20 GW. A draft renewable energy policy proposes the establishment of a renewable portfolio standard of 10 percent renewable energy by 2010 and 20 percent by 2020. As part of this proposal, India's recently announced National Solar Mission proposes the installation of 20 GW of solar power by 2020, the largest national target for solar power to date, and companion proposals aim for a 5 percent reduction of energy consumption by 2015, saving 100 million tons of CO2 each year. India's National Mission for a Green India (proposed but not yet approved) would increase forest coverage from 23 percent to 33 percent, and its National Mission for Sustaining the Himalayan Ecosystem and National Mission for Sustainable Agriculture would implement adaptation projects that include ecosystem monitoring and research into crop resistance.

Brazil's national climate change plan includes a pledge to reduce its annual rate of deforestation 50 percent from current levels by 2018. This would be a reduction of 70 percent below previously higher levels of deforestation between 1996 and 2005. To implement this pledge, Brazil's federal government established an Amazon Fund to support and enforce forest conservation efforts, and the government of Norway provided $1 billion for the fund. Brazil's plan also includes an energy efficiency policy to reduce electricity consumption 10 percent below expected levels in 2030 and pursue renewable energy targets to maintain the country's already high 89 percent share of electricity from renewable sources and to increase ethanol use 11 percent annually over the next 10 years.

In the United States, energy legislation approved in the House of Representatives, H.R. 2454, the American Clean Energy and Security Act of 2009, would require 20 percent of the nation's electricity in 2020 to come from a combination of renewable energy sources and energy efficiency improvements. This proposal, combined with other efficiency measures in the bill and initiatives by the Obama administration, such as raising auto fuel economy to 35.5 miles per gallon in 2016, lays the groundwork for a level of effort commensurate with the goals we propose. H.R. 2454 also allocates 5 percent of allowance permits (some $4 billion annually) for tropical forest conservation and 1 percent (some $768 million annually) for adaptation assistance through 2020 (the amounts change thereafter). The bill further authorizes the purchase of up to 1.5 billion tons of international emissions offsets from tropical forest conservation programs. If agreed by the Senate and preserved in final legislation, the impact of these complementary measures would be significant. While H.R. 2454 specifies an emissions reduction target of 17 percent below 2005 levels in 2020—essentially returning emissions to 1990 levels—analysis by the World Resources Institute suggests that emission reductions of 23 percent below 1990 levels could be achieved if all of the bill's complementary measures are taken into account.

Conclusion

Energy efficiency, renewable energy, forest conservation and sustainable land use, and adaptation are core elements for immediate action on climate change in developed and developing countries. They provide substantial economic, security, and environmental benefits that make them attractive beyond their value as responses to climate change. A new international climate agreement will provide urgently needed incentives and resources to scale up national action in these areas. At the same time, increased international support for these actions will, in its own right, help to shape an effective climate agreement over time. The U.N. Framework Convention on Climate Change in Copenhagen will be the beginning of a sustained international effort to address climate change.

Especially important in that effort will be financing and technology cooperation in developing countries. Vital source of financing will be the carbon markets financed by cap-and-trade programs, carbon taxes, and other measures taken by developed countries under the new international climate agreement. New international institutions may be needed to administer financial assistance and technology cooperation under the agreement. But these will take time to develop and scale up. In the mean time, substantially increased public funding through existing institutions will be essential for progress in all of the areas discussed in this paper.

Immediate increases in public funding should include replenishing the Global Environment Facility at a higher level with needed reforms, expanding special climate initiatives at the World Bank and other international financial institutions and mainstreaming low-carbon development strategies into their core operations, and increasing bilateral aid programs. The immediate focus of scaled-up public funding should be on policy development and capacity building. Public funds should be deployed to leverage larger flows of private-sector investment, stimulate innovation, and support technology research, development, and deployment. Existing technical institutions such as the agriculture and forestry centers in the Consultative Group on International Agricultural Research should be scaled up and tasked with helping to develop and deploy technologies for climate mitigation and adaptation. A similar network should be developed to focus on energy efficiency and renewable energy technologies.

These immediate first steps will help to accelerate the larger and longer-term commitments needed to meet the climate challenge. The Copenhagen conference would provide an ideal platform to take these first steps by increasing international support for the core elements of an effective climate strategy.

Endnotes

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The United Nations Foundation is an advocate for the UN and a platform for connecting people, ideas, and resources to help the United Nations solve global problems. We build partnerships, grow constituencies, mobilize resources, and advocate policy changes to support the UN's work for individual and global progress. A public charity, the Foundation was created in 1998 with entrepreneur and philanthropist Ted Turner's historic $1 billion gift to support UN causes and activities.

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