

The Case for Action

CREATING A CLEAN ENERGY FUTURE

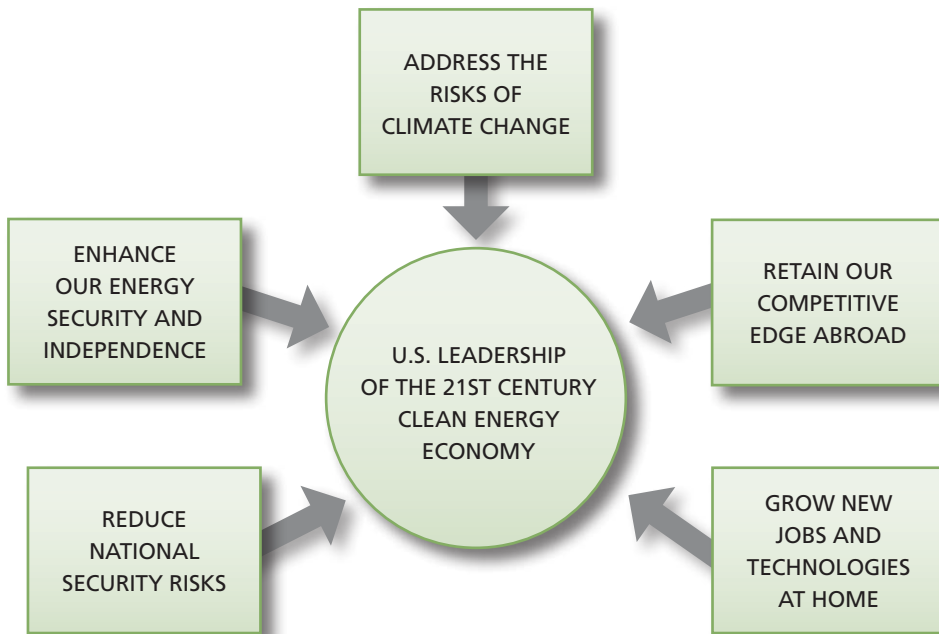




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CREATING A CLEAN ENERGY FUTURE

The United States needs strong action now to reduce the risks of climate change, strengthen our energy independence, protect our national security, and create new jobs and economic opportunities. The Pew Center on Global Climate Change believes that the case for action has never been stronger. With a strong energy and climate policy the United States can lead the 21st century clean energy economy.



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The Science on Climate Change is Compelling

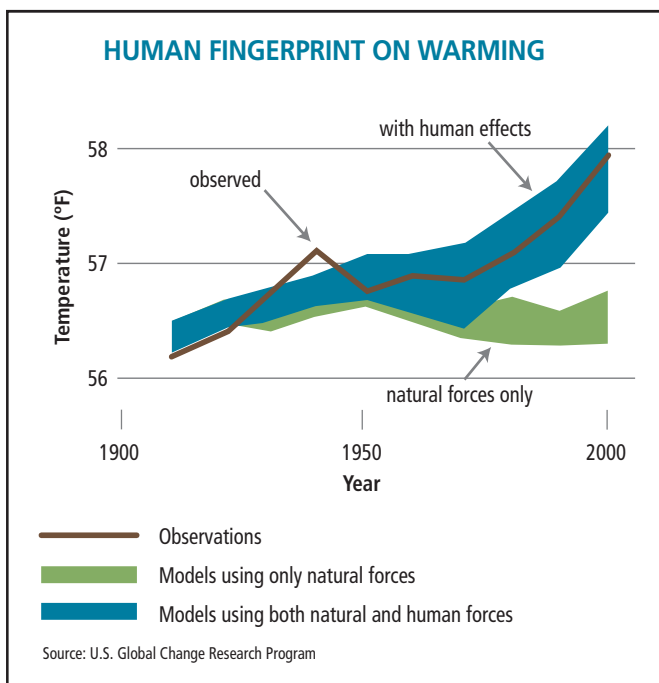
Although climate science is complex and uncertainties remain, the scientific evidence is clear and compelling: the climate is changing due to human activities. The basis for the scientific understanding of

human-caused global climate change is rooted in principles of physics and supported by multiple independent lines of evidence. We know the earth's surface is warming from millions of temperature measurements, accelerating sea level rise, and world-wide loss of snow and ice. We also know that CO₂ traps heat, that atmospheric CO₂ and the earth's temperature track each other closely, and that human activities have driven CO₂ and other heat-trapping gases to higher concentrations than at any time in at least 800,000 years. These pieces of the climate puzzle are very well understood.

Only increasing greenhouse gases can explain the observed warming trend since the mid-20th century. The green band in the figure at left shows how global average temperatures would have changed due to natural forces only, as simulated by climate models. The blue band shows model projections of the effects of human and natural forces combined. The brown line shows the observed global average temperatures. Natural forces

(the sun and volcanoes) alone (green) would have cooled the planet in recent decades, whereas natural and human forces combined (blue) simulate the observed climate quite well.

Climate change is real, it is caused primarily by manmade greenhouse gases (mostly CO₂), and future climate change will only increase as our emissions of greenhouse gases increase.



“It is unequivocal that the climate is changing, and it is very likely that this is predominantly caused by the increasing human interference with the atmosphere.” — U.S. National Academy of Sciences



“Climate change is happening now and it’s happening in our own backyards and it affects the kinds of things people care about.” — Jane Lubchenco, NOAA Administrator

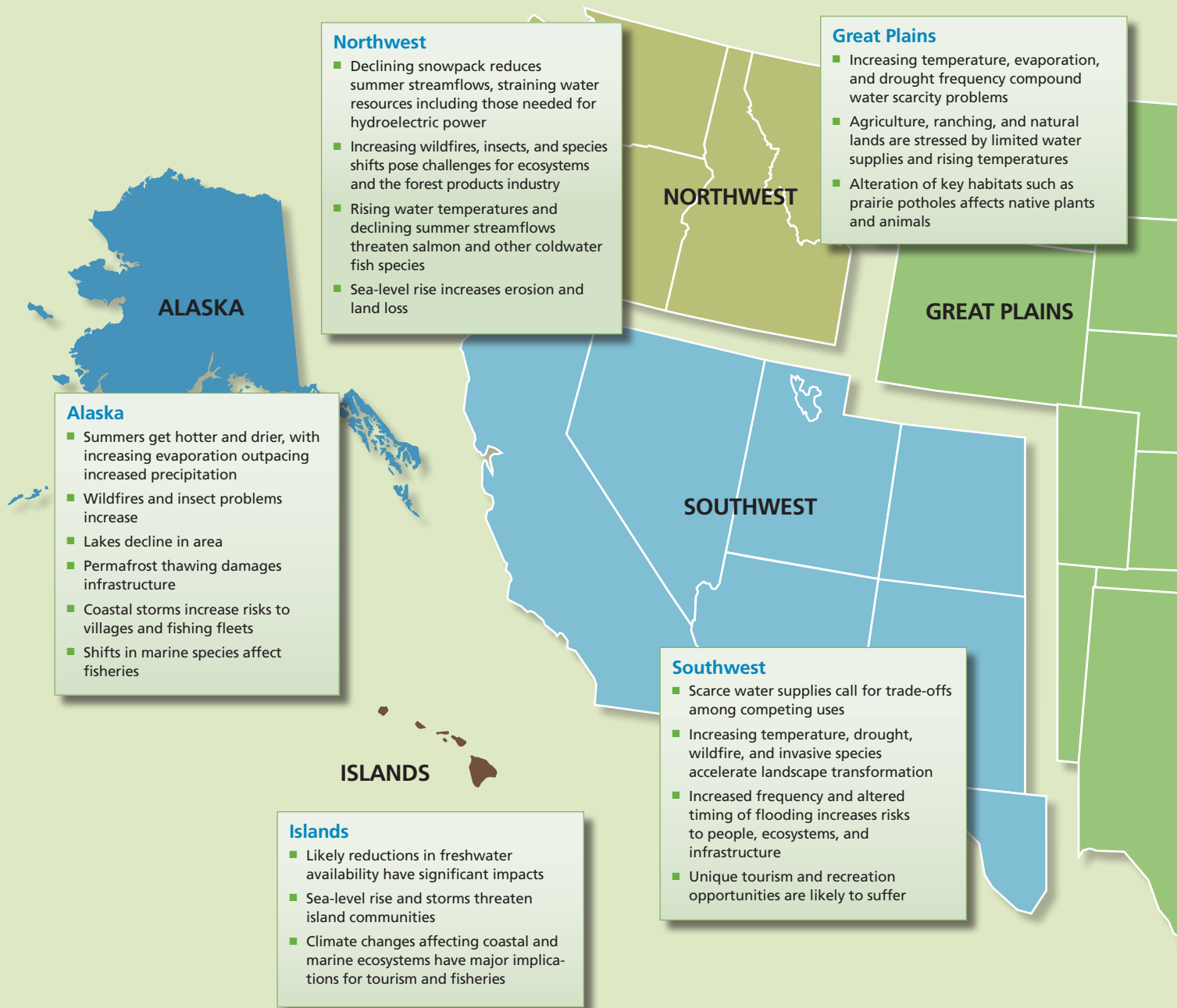
The Impacts Are Here and Now

The United States Global Change Research Program (USGCRP) found that climate change impacts are already under way in the United States, including increases in heavy downpours and snowfall, rising temperatures, more frequent heat waves, rapidly retreating glaciers, thawing permafrost, and changes in river flows. The USGCRP concluded that these changes—which are already affecting water, energy, transportation, agriculture, ecosystems, and health in the United States—will likely grow under projected climate change.

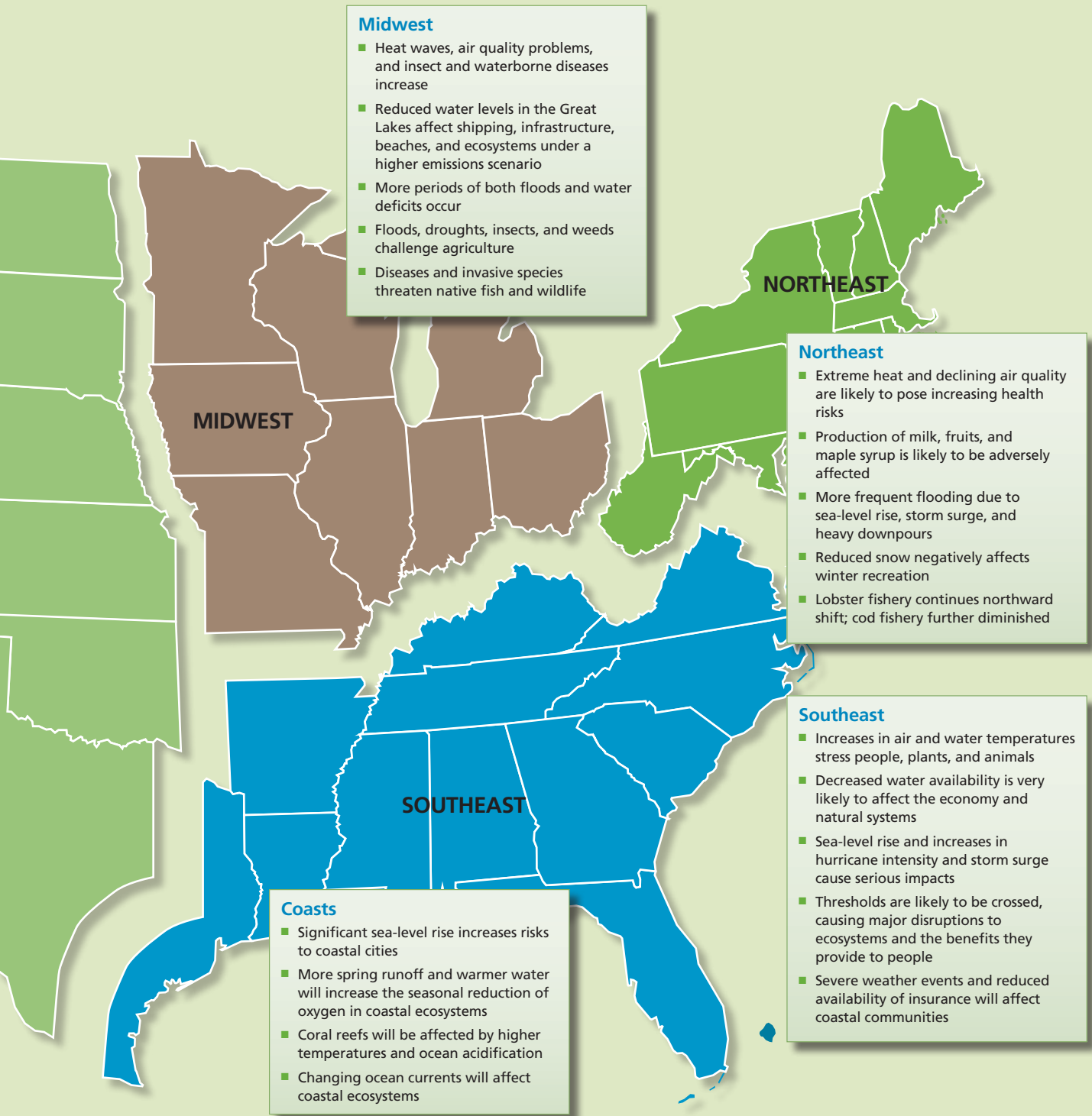
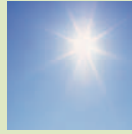
Without taking action now to begin reducing our emissions, coastal areas will be at increased risk from sea level rise and more intense storms; southern states will be at risk from increased droughts, floods and heat waves; midwestern states will face more extreme flooding and more frequent and severe heat waves; and western states will face increased droughts, invasive species, and wildfires. Although the precise future impacts are uncertain, the risks are clear and justify serious action to reduce emissions as soon as possible.

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CLIMATE IMPACTS ACROSS THE UNITED STATES



Source: U.S. Global Change Research Program



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“Climate change poses a clear and present danger to the United States of America.” — Vice Admiral Lee F. Gunn, (U.S. Navy, Ret.)

Our National Security is Increasingly at Risk

Respected voices in the U.S. national security community—generals, CIA analysts, high-level Pentagon officials—have warned that global climate change threatens American security. In fact, the national security community is already taking steps to prepare for the risks of climate change. In February 2010, the Pentagon released its Quadrennial Defense Review, and noted that climate change will affect the Department of Defense in two broad ways. First, it will shape the operating environment and missions by acting as “an accelerant of instability or conflict, placing a burden to respond on civilian institutions and militaries around the world.” And second, the military will need to adjust to the impacts of climate change on its facilities and capabilities.

Climate Change Will Alter the Foreign Policy Landscape

America faces a shifting strategic landscape in which an increasing demand for natural resources often drives national priorities. Since climate change affects the distribution and availability of many critical natural resources, it can act as a “threat multiplier” by causing competition and exacerbating existing tensions between ethnic or political rivals. For example, increased droughts or more intense storms can exacerbate politically unstable situations leading to civil unrest, mass migrations and military actions. Today, drought, thirst, and hunger are exacerbating the conflicts and humanitarian disasters in Darfur and Somalia, and climate change portends more situations like these.



The island of Diego Garcia hosts a key air base giving the U.S. military access to the Middle East and Central Asia. The island is just four feet above sea level on average.



U.S. Military Missions and Operations Will Be Impacted

If not addressed, climate change has the potential to directly impact military operations and increase the number and scope of the missions of our already heavily burdened military:

- Military facilities and personnel will be impacted directly. Sea level rise and taller storm surges will encroach on important coastal installations around the world. Increasing land area under drought will affect how and where U.S. forces acquire and transport water to support operations. Weather conditions will become more extreme in places where the local climate already presents serious operational challenges.
- In the aftermaths of Hurricane Katrina, the 2004 Indonesian tsunami, and the 2010 Haiti earthquake, the U.S. Military provided critical services to survivors. In the future, there is likely to be an increase in the frequency of certain climate related natural disasters (e.g., violent storms, floods, droughts), leading to more calls for such missions.
- Climate change will create new theaters of operation. For instance, the opening of the Arctic, which is losing sea ice very rapidly, will force the U.S. military to deploy significant assets to this newly accessible, resource-rich area.

“Global climate change has the potential, if left unchecked, of adding missions to the already heavy burdens of our military and other elements of our nation’s overall national security.”

— Sen. John Warner (Ret.), Former Chairman of the Senate Armed Services Committee

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Energy Security and Independence

Dependence on oil is a source of major economic, political, and strategic problems for the United States. We are the world's largest oil importer and currently import close to 60 percent of the oil we consume (Source: EIA). This results in the United States spending hundreds of thousands of dollars per minute on foreign oil. The Department of Defense has reported that it spends upwards of \$400 per gallon to get fuel to soldiers in the field. A study by the U.S. EPA and the Oak Ridge National Laboratory estimated that a reduction of U.S. imported oil results in a total energy security benefit of \$12.38 per barrel of oil, in part by reducing defense spending. A new clean energy economy that includes efficient energy production, distribution and usage, as well as alternative, lower-carbon energy sources will mean less dependence on foreign sources of energy. This will translate into less vulnerability to global energy supply and price fluctuations and gasoline price hikes.

“America faces an energy challenge and an opportunity to lead the world in a new industrial revolution.”

— Steven Chu, Secretary, Department of Energy

Our Chance to Create the Clean Energy Economy of the Future

From the Industrial Revolution to the dot com boom, American businesses have always been leaders in innovation and entrepreneurship. Our economic future depends on us taking a leading role in the rapidly emerging global market for clean energy technology. A clean energy economy will mean we are less dependent on foreign oil and less dependent on fuels that pollute our planet and change our climate. It will also enhance the competitiveness of U.S. firms and lead to more jobs at home.

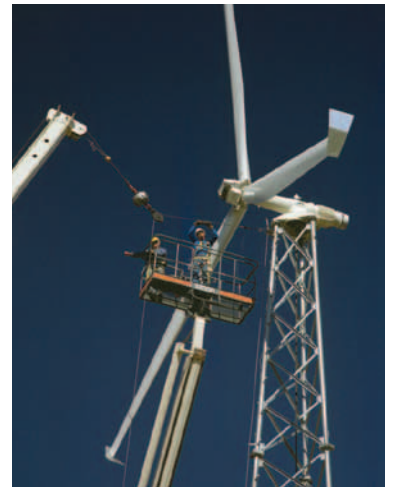


Enhanced Global Competitiveness in Clean Energy

Clean energy is a major emerging global business that presents huge opportunities for American firms and workers. But to seize these opportunities, we have to act now. Between 2004 and 2007, global investments in renewable energy more than doubled (Source: German Environment Ministry). Global clean energy markets will grow significantly in the coming decades; markets for clean energy sources could reach a cumulative total of \$1.58 trillion from 2010–2020 and as much as \$1.75 trillion from 2021–2030 (Source: IEA). The United States stands to benefit from the development of these markets, but only if it moves quickly to support domestic demand for and production of clean energy technologies.

Recognizing the potential size of these markets, China and several European nations are moving swiftly to cultivate their own clean energy industries and are poised to gain large market shares in the decades ahead. Ninety percent of today's market for new clean energy technologies is outside of the United States, primarily in Asia and Europe (Source: NREL). In 2009, China surpassed the United States in clean energy technology investment. Of the top five wind power companies in the world today, only one is American. It is a similar story with solar panel producers—there is only one American company in the top ten. China now boasts the world's largest solar panel manufacturing industry—which exports about 95 percent of its production to countries including the United States (Source: UNEP). Americans claim just two of the spots in the global top 10 of advanced battery manufacturers. The United States should not cede leadership in these rapidly growing sectors to our competitors.

Other nations are already demonstrating how climate and clean energy policies can provide an edge in preparing for the clean energy technology markets of the future. The time to act is now: through policy leadership at home and abroad, America can position itself to become a market leader in the industries of the 21st century. Without a clear policy, we are in danger of being left behind as German, Chinese, French and Japanese companies vie amongst themselves for leadership positions in the next great global industry: clean energy.



The International Energy Agency estimates that cumulative global investments in clean power generation technologies between 2010 and 2020 will total \$1.58 trillion.

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More Jobs at Home

By developing innovative sources of clean energy we will develop new technologies and new industries, creating good jobs at home that can't be outsourced. Many clean energy jobs will rely on existing skills and worker expertise—in areas such as manufacturing and construction—to make homes more energy efficient and to build wind generators or solar panels. Jobs such as installers, welders, and construction workers must be located where the demand is, so domestic demand for clean energy technology can foster domestic job growth even when industry supply chains are globally dispersed.



American companies can play a much bigger role in the emerging clean energy industries, and create thousands of good manufacturing jobs in the process. As a result of its energy policies, Germany estimates it will gain over 70,000 jobs by 2020 and 80,000 jobs by 2030 (Source: German Environment Ministry). We have all the right ingredients in place—a world-class higher education system, the most skilled workforce in the world, and an entrepreneurial culture that values creativity and rewards risk taking. All we're missing is policy support.

Smart policies will trigger new investment, innovation, and technology, and position our firms and workers to lead the way in the new clean energy economy. While new jobs and industries are created, transitioning to a low-carbon economy will require some industries to adapt, and protecting vulnerable workers while helping them to acquire the skills to succeed in this new economy must be a goal of any comprehensive energy and climate policy.

With the right policy in place, investment in residential and commercial building and appliance efficiency in the United States could reach a cumulative total of \$160 billion by 2030.



Businesses Need Investment and Regulatory Certainty

Companies need long-term certainty and clear rules of the road to help them build the clean energy economy of the future. Business leaders today face a dilemma. There is a general consensus among them that some form of national energy and climate policy is coming, but they do not yet know exactly what will be required of them. The absence of a clear national policy creates significant uncertainty, which delays investment, stalls job growth, and hampers our nation's economic competitiveness. By harnessing market mechanisms we can create the incentives and certainty to make the necessary investments in next generation technology across sectors.

Spurring Concerted Global Action

Climate change is a global challenge and meeting that challenge requires the concerted efforts of all of the world's major economies. A balanced global effort also is the best way to ensure that no country suffers a competitive disadvantage as it takes steps to reduce greenhouse gas emissions. A fair and effective international framework is only likely, however, with strong leadership from the United States.

Many other countries are beginning to take stronger action. The Copenhagen Accord negotiated by world leaders includes explicit international pledges from all of the major economies—including the first-ever from China and other major developing countries. With the Accord as a political foundation, governments can now begin building a durable international framework that gives countries confidence that all are contributing their fair share to the global effort. But what can be achieved internationally will depend in large part on what the United States—the world's largest economy, and largest historic greenhouse gas emitter—can bring to the table.

The United States has the opportunity to drive the global climate effort through renewed leadership—by taking the steps needed at home to achieve its pledged emission reductions, by providing the support promised to poor and vulnerable countries, and by encouraging strong commitments by others.



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The Choice is Ours

We are at an important crossroads. We can proceed on the unsustainable path we have been heading down and face energy price spikes, continue to ship billions of dollars abroad, lose out on the clean energy markets of the future, deny the best science available to us, and place our planet in increasing peril. Alternatively, we can respond to the challenges as we have done in the past and chart a new path where the United States leads the world into the clean energy future.

Comprehensive energy and climate legislation can spur the development of new technologies and new job markets and put the United States on this new path. Working with the international community to develop a binding but flexible framework can ensure that all of the world's economies embark on this important journey together.

“As the world’s largest economy and the world’s second largest emitter, America bears our share of responsibility in addressing climate change, and we intend to meet that responsibility.” — President Barack Obama

The Pew Center on Global Climate Change is a non-profit, non-partisan, and independent organization established by the Pew Charitable Trusts to bring a new cooperative approach and critical scientific, economic, and technological expertise to the global climate change debate. We inform this debate through wide-ranging analyses that add new facts and perspectives in four areas: policy (domestic and international), economics, environment, and solutions.

PHOTOS COURTESY OF DOE/NREL



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