



## The new adaptation marketplace: Climate change and opportunities for green economic growth

Climate change is a growing humanitarian crisis that we cannot ignore. Developing innovative ways to adapt to its impacts is a necessity. Policies that address the impact of global warming on the world's most vulnerable communities can drive the market toward new innovation and stimulate the US economy.

It is critical that we make investments in what are known as “climate change preparedness” or “adaptation” measures. These strategies can help reduce the risk of harm to vulnerable communities by building resilience to the impacts of climate change. For example, one adaptation approach enables people in coastal areas to construct or strengthen homes that can withstand stronger storms and increased flooding.

Even with aggressive efforts to reduce emissions, the consequences of climate change will be severe; increased temperatures, rising sea levels, and more intense droughts, floods, and storms threaten the existence of many communities—especially in developing countries. Adaptation efforts reflect the unavoidable fact that the situation is already bad enough. Not only must we dramatically reduce the greenhouse gas emissions that will cause warming in the future, but we must also work to save lives today.

By investing in adaptation strategies, such as flood defenses and efficient irrigation systems, not only can we lessen the impact of future natural disasters, but we can drive economic growth by strengthening infrastructure and spurring the development of new technologies. Strong public policies that provide funding for adaptation have multiple benefits, both in the US and abroad. These include the following:

- Encouraging companies to develop new, innovative technologies and to hire new workers, creating jobs and stimulating the economy;
- Enabling long-term economic growth built around green technologies that are resilient to climate change;
- Helping vulnerable communities in the US and around the world prepare for and respond to the impacts of climate change;
- Safeguarding global security, as climate change acts as a “threat multiplier” in some of the most volatile regions of the world;
- Demonstrating US global leadership.

## Capitalizing on the new “adaptation marketplace”

With focused investment and innovation, the private sector can be an important part of what we term the new “adaptation marketplace.” Building preparedness for climate change through investments in adaptation can incentivize new and expanded economic activity, help create jobs, and reinforce efforts to reduce emissions. We have identified seven sectors where early and rapid growth is most likely.

### Water management

There is increasing demand for technologies and systems that improve water use efficiency and help to ensure that growing demand does not outstrip shrinking water supplies. Many American companies are leaders in developing advanced water management technologies, such as purification, desalination, and water filtration and reuse—all of which are technologies needed in the US and fast-growing overseas markets.

**Pentair Inc.** is a global leader in advanced water technologies, such as pumps and filtration systems, and provides water management solutions for residential, agricultural, commercial, and industrial customers. The Minneapolis-based company employs approximately 13,100 people worldwide and had \$3.35 billion in revenue last year.<sup>1</sup> In New Orleans, Pentair’s Fairbanks Morse Division delivered 11 massive pumps in 2007 as part of the Army Corp’s reconstruction of the city’s flood defense against hurricanes.<sup>2</sup>

**Siemens Water Technologies**, based near Pittsburgh, is a world leader in water management and wastewater treatment. Siemens offers a range of technologies, from emergency water supply and conventional water treatment processes to wastewater reuse systems and advanced filtration systems. Siemens’s water reuse and recycling technologies can help municipalities better manage water supplies in the face of decreasing resources.<sup>3</sup> The division has 174 facilities and 5,700 employees worldwide.<sup>4</sup>

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...🌱 Climate change-driven growth in the water management sector will generate jobs for engineers; planners; and those who specialize in manufacturing and constructing water supply, storage, and purification infrastructure.  
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### Agriculture

The need for agricultural solutions to feed the growing global population—especially in the context of global warming—presents not only challenges, but also enormous business opportunities. American companies are developing solutions like drought-resistant seeds, drip irrigation systems, and innovative pest-control technologies.

**AgraQuest Inc.** is a Davis, CA-based company that develops effective, innovative, and environmentally responsible pest and disease control products and services. Unlike many conventional pesticides, AgraQuest’s products are produced from renewable, biologically based materials. AgraQuest’s BioInnovations Division is developing cutting-edge technologies in seed treatment, food safety, post-harvest disease control, animal health and hygiene, human nutrition, structural pest control, and vector control.<sup>5</sup> The company expects the biological and reduced chemical market to grow from \$1 billion this year to \$5 billion–\$10 billion worldwide by 2017.<sup>6</sup>

**CH2M HILL**, based near Denver, CO, is a full-service engineering, procurement, construction, and operations firm with 24,000 employees.<sup>7</sup> The company has invested in projects that use sustainable, biodynamic agricultural practices that are in harmony with local ecosystems. Their information management design and installation tool integrates data to optimize growing methods and to reduce the amount of water used in the growing process.<sup>8</sup>

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...🌱 Climate change-driven growth in the agriculture sector will generate jobs for crop scientists, researchers, agronomists, sales and marketing firms, and irrigation systems manufacturers and installers.  
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### Energy supply

Renewable energy solutions, such as wind turbines and solar panels, manufactured in the US and distributed abroad, can help meet the challenge of building resilience to climate impacts.

**General Electric**, based in Fairfield, CT, is supplying solar energy modules and water filtration technology to a new initiative to increase the availability of clean drinking water in rural areas of India and other developing countries in the East Asia region and Africa. These solar-powered water filtration systems, built in Newark, DE, will be installed in remote areas without access to electricity.<sup>9</sup>

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...🌱 Climate change-driven growth in the energy supply sector will generate jobs for designers, manufacturers, and installers of renewable, resilient energy systems, as well as for energy consultants.  
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## Disaster preparedness

Finding more effective ways of preparing for and recovering from hurricanes, cyclones, and other extreme weather events can save lives, property, and money. US firms have a broad range of technologies that can help, including advanced forecasting systems, resilient building materials, and portable backup equipment. New technologies and innovative tools, such as forecasting equipment, and new construction techniques, can help strengthen homes and buildings against the effects of water and wind.

**WeatherPredict Consulting Inc.**, with offices in North Carolina and Rhode Island, is developing AeroEdge™, an aerodynamic retrofit technique designed to protect roofs from the effects of strong winds. The company estimates that 70 percent of damage during the 2004 and 2005 hurricane seasons began on roofs.<sup>10</sup> WeatherPredict also provides tropical cyclone forecasting tools that enable clients to analyze all aspects of hurricane risk. These products and services include real-time forecasts of developing hurricanes anywhere in the world, computer simulations of historical hurricanes, and forecasts of how climate variability will change hurricane frequency and severity.<sup>11</sup>

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... Climate change-driven growth in the disaster preparedness sector will generate jobs in planning, manufacturing and installation of resilient materials, pre-disaster retrofitting, and post-disaster reconstruction.

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## Insurance

Analysts predict that climate change will significantly increase the costs of insurance payouts for weather-related disasters over the coming decades.<sup>12</sup> American expertise in areas like risk mitigation and financial innovation can drive growth in this sector.

**Swiss Re**, a major international reinsurer with 18 offices around the US, is seizing climate change-related market opportunities. The company has been working for 20 years to better understand the threats of climate change and implement risk mitigation measures. Swiss Re is developing specific insurance products to help clients mitigate and transfer climate risk, such as weather risk insurance and catastrophe bonds, securities that provide coverage for natural catastrophe-related risks. Investors who buy these bonds receive a fixed rate of interest but lose all or part of the principal if a specified event, such as a hurricane, occurs.<sup>13</sup>

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... Climate change-driven growth in the insurance sector will generate jobs for risk analysts, planners, project managers, and financial service providers.

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## Coastal and natural resource management

More than 60 percent of the world's population lives within 60 miles of a coastline, putting millions of people at risk as sea levels rise and we face increasingly severe storms and heavy rains. Better land and resource management such as basin and watershed planning, wetlands and riparian restoration, and fish and aquatic resource management will create natural barriers for ecosystems and coastal areas vulnerable to climate impacts.

**Industrial Economics Inc.**, a consulting firm based in Cambridge, MA, is developing a sea level rise (SLR) economic assessment tool for the US Environmental Protection Agency (EPA). The tool uses both global climate change scenarios and land elevation and planning data to predict the impacts of SLR on communities in coastal New Jersey. The goals of the tool are to estimate economic damages resulting from SLR and to facilitate local-level adaptation planning.<sup>14</sup>

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... Climate change-driven growth in the coastal zone protection sector will generate jobs for those involved in planning and mapping, engineering, scientific analysis, and a variety of support services and administration.

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## Climate change information and consulting services

Consulting firms can help both the public and private sector to understand the threats posed by climate change and develop adaptation strategies. American consulting firms already have significant planning, economic analysis, computer modeling, and project management capabilities that enable them to design and implement adaptation solutions in the US and abroad.

**ICF International Inc.**, a large environmental consulting firm based in Fairfax, VA, that works with government and corporate clients, including the EPA, has been working on adaptation for more than 10 years, providing strategic advice and support for projects dealing with climate change impacts and vulnerability. ICFI's services provide climate change risk management strategies; climate change adaptation options; economic, technical, and policy analysis; and geographic information system mapping and modeling.<sup>15</sup>

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... Climate change-driven growth in the consulting sector will generate jobs for scientists, planners, project managers, engineers, economists, software and information management systems developers, financial analysts, consultants, and trainers.

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## Enabling the adaptation marketplace

Innovative adaptation solutions are an integral part of a global transition toward a cleaner, expanded economy. Taking advantage of opportunities in the adaptation marketplace requires smart policies that promote planning for the impacts of climate change, provide incentives and funding for adaptation, and direct resources to vulnerable communities in the US and in developing countries.

### How can the government help stimulate the adaptation marketplace?

- **By prioritizing adaptation and starting to plan now.** Public sector leadership can help highlight the multiple benefits of adaptation investments. As with efforts to reduce emissions, the private sector will respond to a strong government signal and begin developing solutions. Funding for adaptation planning will encourage investments in resilient infrastructure that will create jobs and provide long-term economic benefits. Climate change impacts should also be considered when planning and developing public infrastructure projects.
- **By dedicating funding.** A dedicated adaptation funding mechanism must be part of US climate legislation. Long-term, guaranteed sources of funding for both domestic and international adaptation are essential for stimulating investment, generating jobs, building a resilient infrastructure, and providing assistance to vulnerable communities. If companies know that resources for adaptation are being provided, they will build their capabilities accordingly, thus generating employment. Increased funding for international adaptation will demonstrate US leadership and provide opportunities for companies to invest in vulnerable developing countries.

### How can companies invest in the adaptation marketplace?

- **By understanding climate change and how their company can help.** Businesses that understand how climate change is likely to impact their operations, markets, and customers can develop strategies for maximizing opportunities and minimizing risks.
- **By engaging in public policy. Government policies will be crucial for stimulating adaptation planning and spending.** Companies need to make the case for adaptation funding as a business opportunity and work with governments to develop integrated solutions.
- **By preparing for the future.** Companies that develop climate-resilient and sustainable products and services will be better positioned to respond to a changing world and meet demand. For example, companies with smart water management technologies can use their expertise to develop solutions to climate-related water management challenges.

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“ We see investments in adaptation as a win-win. Adaptation efforts that respond to more severe climate impacts at home and abroad can create new jobs and drive economic growth. They can also help developing countries cope with a changing climate. ”

—Brian Bieron, Senior Director, Federal Government Relations and Global Public Policy, eBay Inc.

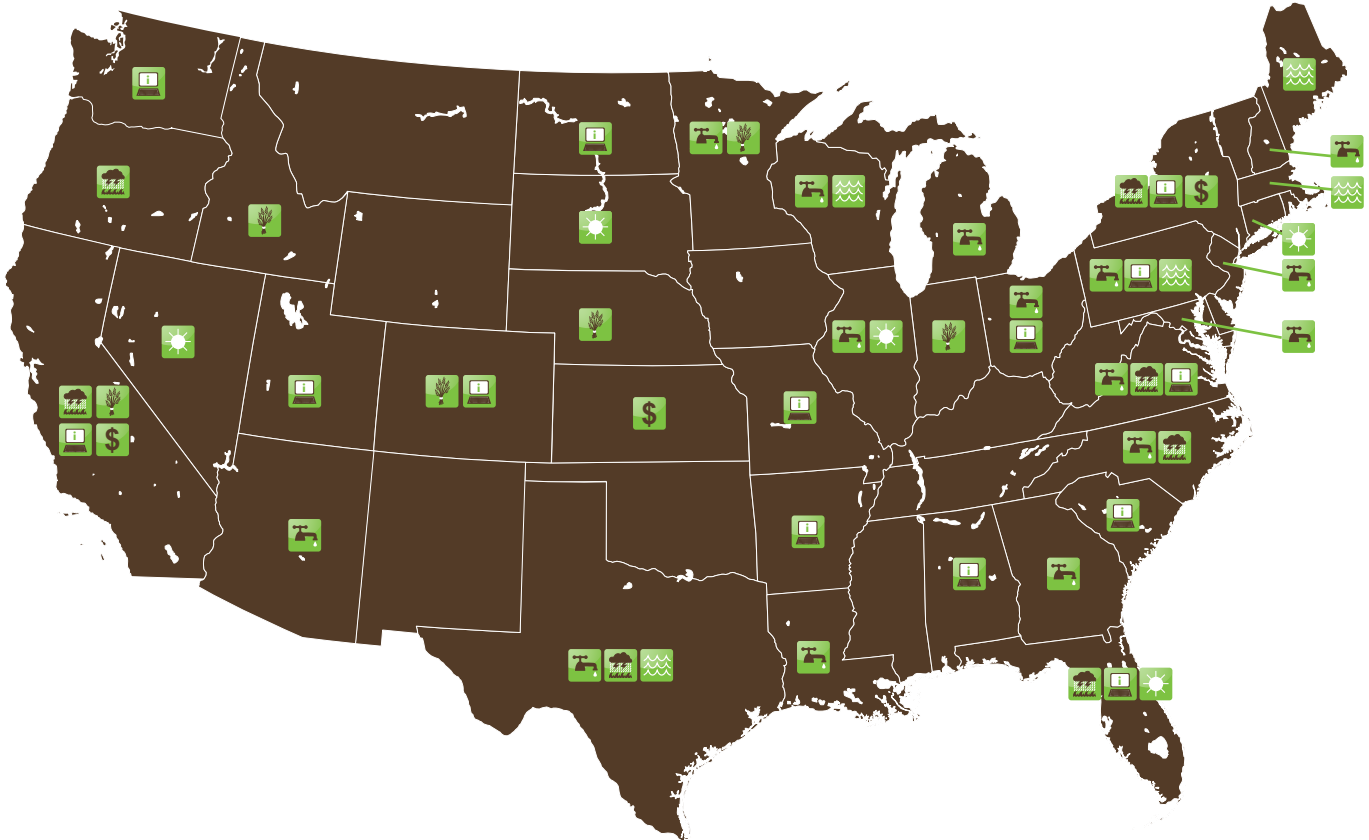
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“ Paul Schuler of General Electric’s Water Technologies Unit says that GE wants to ensure that its products, everything from systems that recycle wastewater to high-tech purifiers, are the go-to technologies for drought-prone regions. ... *‘In all honesty, it’s a money-making strategy, but you can do the right thing and make money. They’re not mutually exclusive.’* ”

—National Public Radio’s Marketplace, June 25, 2009

## The adaptation marketplace

The map below represents a sampling of companies operating in the US that develop products and provide services that build climate preparedness. These and other firms stand to benefit from an increase in adaptation market opportunities that spur innovation and create jobs. Public financing for climate change adaptation will increase demand opportunities for well-positioned companies.<sup>16</sup>



### Water management

- AZ Meridian Design Inc.
- GA RainTrapper Environmental Solutions Inc.
- IL Rain Harvesting Ply Ltd.
- LA Delta Water Inc.
- MD Aquabarrel
- MI Dow
- MN Pentair, Inc.
- NC Bord na Móna Environmental Products US Inc. BRAE
- NJ Englert Inc.
- OH Biolet Toilet Systems Inc.
- NH SkyJuice New England
- PA Siemens Water Technologies
- TX Lakota Water Company
- VA Rainwater Management Solutions (RMS)

### Disaster preparedness

- CA ESRI  
Goodman Ball Inc.
- FL American Ingenuity
- NY MOS Architects
- NC Weather Predict Consulting, Inc.
- OR ExploraTrack
- TX Monolithic
- VA Ordia Solutions Inc.

### Agriculture

- CA Agraquest  
DIG Corporation  
Geoflow  
Netafim USA  
JohnDeere Water Technologies
- CO CH2M HILL
- ID Acclima Inc.
- IN Water Your Landscape
- MN DripGrip  
The Toro Company
- NE Arrow Seed

### Climate information and consulting services

- AL P. E. LaMoreaux & Associates Inc.
- AR Winrock International
- CA Science Applications International Corporation (SAIC)
- CO DOMANI
- FL PBSJ Corporation
- MO Berkebile Nelson Immenschuh  
McDowell (BNIM)
- NY Halcrow
- ND Advanced Engineering and Environmental Services Inc.
- OH Evans, Mechwart, Hambleton & Tilton Inc. (EMH&T Inc.)

- PA Sustainable Community Development Company
- SC Wilbur Smith Associates
- UT Horrocks Engineers, Inc.
- VA ICF International, Inc.
- WA Integral Consulting, Inc.

### Energy

- CT General Electric
- FL EcoloBlue Inc.
- IL Sun Ovens International Inc.
- NV Aqua Sun International
- SD GenPro Energy Solutions LLC

### Coastal and natural resource management

- ME Kleinschmidt
- MA Industrial Economics
- PA Weston Solutions Inc.
- TX Entrix Inc.
- WI Applied Ecological Services, Inc.

### Insurance

- CA Weather Bill Inc.
- KS Vortex Insurance Agency LLC
- NY Swiss Re

While least responsible for causing climate change, poor people bear the brunt of its impacts. As an international relief and development organization dedicated to finding lasting solutions to poverty and injustice, Oxfam America is undertaking a campaign to create equitable solutions to the crisis. We are asking that the US cut greenhouse gas emissions and provide financial assistance so that the most vulnerable communities can adapt. For more information, go to [www.oxfamamerica.org/climate](http://www.oxfamamerica.org/climate).

## Notes

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- 2 Pentair Inc., "Flow technologies feature story: Helping protect New Orleans," [www.pentair.com/Our-Businesses/Flow-Technologies/Helping-Protect-New-Orleans.aspx](http://www.pentair.com/Our-Businesses/Flow-Technologies/Helping-Protect-New-Orleans.aspx).
- 3 Siemens Water Technologies, "Wastewater: Answers for the environment," [www.water.siemens.com/en/municipal/wastewater/pages/weftec\\_2008.aspx](http://www.water.siemens.com/en/municipal/wastewater/pages/weftec_2008.aspx).
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- 5 AgraQuest Inc., "About AgraQuest," [www.agraquest.com/corporate/about-agraquest.php](http://www.agraquest.com/corporate/about-agraquest.php).
- 6 Rebecca Coons, "Biopesticide firm sees a green future," *Chemical Week*, June 8/15, 2009, 61, [www.agraquest.com/news/wp-content/uploads/2009/07/chem-week-article-061509.pdf](http://www.agraquest.com/news/wp-content/uploads/2009/07/chem-week-article-061509.pdf).
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- 11 WeatherPredict Consulting Inc., "Tropical cyclone forecasting and risk analysis," [www.weatherpredict.com/products/tropicalCyclone-forecasting.html](http://www.weatherpredict.com/products/tropicalCyclone-forecasting.html).
- 12 Climate Risk Management and Metro-economica, "Financial Risks of Climate Change," June 2005 summary report (London: Association of British Insurers, 2005), [www.climatewise.org.uk/storage/610/financial\\_risks\\_of\\_climate\\_change.pdf](http://www.climatewise.org.uk/storage/610/financial_risks_of_climate_change.pdf) (accessed May 8, 2009).
- 13 Communication with Reto Schnarwiler, director of insurance and specialty, and Andreas Spiegel, senior climate change adviser, Swiss Re, April 22, 2009.
- 14 Communication with James E. Neumann, principal, Industrial Economics Inc., May 10, 2009.
- 15 ICF International Inc., "Impacts, Vulnerability, and Adaptation," [www.icfi.com/markets/climate-change/climate-impacts.asp](http://www.icfi.com/markets/climate-change/climate-impacts.asp) (information for adaptation marketplace map, accessed May 6, 2009).
- 16 The list of companies presented in this piece is intended to be illustrative and is not comprehensive. The inclusion of these companies should not be construed as an endorsement in any way by Oxfam. While it is not necessarily the stated mission of these companies to address climate change impacts, all of them develop products and provide services that can deliver solutions to some of the social and natural resource challenges associated with climate change.



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COVER: In rural communities of El Salvador's Zacatecoluca province, clean water is hard to come by, especially for families who depend on hand-dug wells susceptible to contamination during times of flooding. Oxfam's local partner, PROVIDA, has helped to construct a series of "healthy wells" which are lined, surrounded with a filter, and capped to ensure their cleanliness. PROVIDA's Antonio Jovel checks on one of the healthy wells. *Luis Galdámez / Oxfam America*