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Sustainability

Practitioner Insights: Adapting to Climate Adaptation: Implications and Opportunities for the Private Sector



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Preparing for a warmer world, with the prospect of more frequent intense weather, extended droughts and rising seas, is bringing a new focus on resilience for land use and development policies and public infrastructure projects.

These developments present implications and opportunities for the private sector. A climate adaptation project is in many ways like any other, requiring planning, financing, design and engineering, entitlements, construction, operation and maintenance. But its planning and objectives will incorporate resilience from the outset, with resistance to anticipated climate stresses taken into account at all stages.

The terms “climate adaptation” and “climate resilience” generally refer to the ability of society, infrastructure and ecosystems to withstand and recover from the consequences of climate change. In the early years of public concern with global warming, when climate scientists first suggested giving thought to adaptation, many environmental advocates and regulators viewed the subject with suspicion, as undercutting the effort to control greenhouse gas emissions. Today, that view has changed. High-profile and controversial initiatives, such as the Paris Climate Agreement and the Obama Administration’s Clean Power Plan, emphasize emission reductions. But regardless of whether one believes that climate change is human-caused or a naturally occurring phenomenon, the prospect of more frequent intense weather, extended droughts and rising seas is prompting widespread concern, leading to re-

newed discussion on the need to prepare for a warmer world.

Much of the attention to date is at the government level, focused on land use and development policies and public infrastructure projects. But there are also implications and opportunities for the private sector. A climate adaptation project is in many ways like any other project, requiring planning, financing, design and engineering, entitlements, construction, operation and maintenance—but with resistance to anticipated climate stresses taken into account at all stages. In the near term, project developers and the construction and other industries can expect to benefit from increased public agency planning and investment to enhance climate resilience. More broadly, engaging with climate adaptation can provide companies, particularly those with infrastructure-heavy and development-oriented business models, with an opportunity to adapt their own plans, investments and activities to reduce vulnerability to a changing climate and to protect their long term interests through strategic business planning and project design.

Federal Efforts to Address Climate Adaptation On Oct. 31, the Obama administration released a new report, *Opportunities to Enhance the Nation’s Resilience to Climate Change*, describing federal efforts in this area to date and recommending, among other things, improved coordination with the private sector on knowledge, resources and strategies for addressing climate-related risks. The report discusses opportunities for action such as building climate adaptation into both public- and private-sector decision-making, establishing incentives

and requirements to increase infrastructure resilience, evaluating the performance of resilience investments and supporting community adaptation efforts. On the same day, the administration launched the *Resilience Dialogues*, an online consultation service designed to connect private, governmental, academic, and non-profit organizations, to enable sharing of technical and programmatic resources and help meet community resilience needs.

These developments build on prior federal efforts including a draft framework released in June by the Environmental Protection Agency, *Evaluating Urban Resilience to Climate Change: A Multi-Sector Approach*. The framework document proposes indicators for assessing the ability of urban environments to reduce the magnitude of harm and to more rapidly recover from both long-term climate change and extreme weather. The indicators show whether a location is prepared to withstand gradual changes, such as higher average temperatures, increasing wind strength and precipitation and sea level rise, as well as extreme events, such as hotter and longer heat waves, storm surges and flooding, droughts and stronger hurricanes. The framework will be utilized by federal agencies and also will likely serve as a model for state and local climate adaptation efforts. As such, it provides a reference point for developers seeking government permits and approvals for development projects. In addition, the framework may provide a useful model for businesses and developers to benchmark their own resiliency by evaluating specific risks, including vulnerability of below-ground infrastructure components to salt water intrusion or the effect of changing temperatures on project materials such as common asphalt formulations.

Climate resilience is also an increasing focus of government decision-making on infrastructure projects. In 2015, Obama signed Executive Order 13690, requiring federally funded capital projects to consider the potential for increased flood severity. Pursuant to the executive order, the Department of Housing and Urban Development is proposing new floodproofing standards for federally assisted and financed projects (81 Fed. Reg. 74,967). In addition, the long-awaited final guidance from the White House Council on Environmental Quality on *Consideration of Greenhouse Gas Emissions and Effects of Climate Change in National Environmental Policy Act Reviews*, issued in August, directs agencies preparing environmental impact statements or environmental assessments to consider opportunities for resilience and adaptation. In addition to the more conventional evaluation of project greenhouse gas emissions as a potential contribution to climate change, the guidance advises that environmental reviews consider the effects of climate change on the project itself, including its vulnerability to rising sea level, drought, high intensity precipitation events, increased fire risk or climate-related ecological change, at the time of project implementation and into the future. This guidance applies not only to projects directly undertaken by federal agencies but also to state, local and private projects that receive federal funding, permits, leases or other approvals.

Conversely, in some instances, climate adaptation has served as a rationale for precluding development. For example, the Obama Administration cited the need to preserve large contiguous areas of habitat in order to bolster resilience and help maintain connectivity

against climate stresses when designating 87,000 acres of Maine north woods as a national monument and adding 139,797 square miles to a national monument off the coast of Hawaii.

California Takes the Lead California, with more than 800 miles of coastline and facing a historic drought, has been an early adopter of climate adaptation planning. In 2014, the California Natural Resources Agency issued *Safeguarding California: Reducing Climate Risk*, as an update to the state's Climate Adaptation Strategy. The document identifies sea level rise as a key threat, posing risks such as inundation of low-lying power plants and release of toxic chemicals from flooded facilities or land containing hazardous materials. In particular, this document stakes out the strong position that California "should not build or plan to build, lease, fund or permit any significant new structures or infrastructure that will require new protection from sea-level rise, storm surges or coastal erosion during the expected life of the structure, beyond routine maintenance of existing levees or other protective measures, unless there is a compelling need." Climate risks should be taken into account in planning, siting, design, construction and maintenance, and risk-benefit analysis should be conducted at project inception to evaluate anticipated benefits against the cost of protecting the infrastructure over the project's lifetime.

Other state agencies also have been active in climate adaptation planning. The Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT) has developed specific guidance for incorporating sea level rise projections into project planning and decision-making. The California Coastal Commission has issued guidance for addressing sea level rise in review of coastal development permits required for new development within the coastal zone. Permit applicants must project sea level rise for the expected life of the proposed project and analyze scenarios of sea level rise impacting the project over time based on considerations including geologic stability, erosion, flooding and stormwater, wave impacts and saltwater intrusion. The applicant also must address impacts on coastal resources and the landscape by the project under different rates of sea level rise, and consider alternatives and adaptation strategies.

The California Legislature has directed further action. For the state's own infrastructure, A.B. 2800 requires state agencies to take current and future climate change impacts into account when planning, designing, building, operating, maintaining and investing in state projects, and creates a climate-safe infrastructure working group to incorporate climate data into state infrastructure engineering requirements, including oversight, investment, design, and construction. For projects under local jurisdiction, S.B. 379 requires cities and counties to update their General Plans to address climate adaptation and resiliency strategies, including identification of climate change risks in the local geography, policies and objectives based on the vulnerability assessment, and identification and implementation of feasible resilience measures.

Louisiana's Threatened Economy Louisiana is struggling with sea level rise and increased flooding, at a time when its budget deficit poses a challenge for substantial public investment in climate resilience. In the past, the region's extensive natural marshes, swamps,

and barrier islands could accommodate rainfall and storm surge. However, with approximately 1,880 square miles of the state's coastline consumed by sea level rise over the past eight years, those natural mechanisms will need to be supplemented with mitigation and adaptation measures. A study by Louisiana State University and the Rand Corp. found the state's land loss could cause \$5.8 billion to \$7.4 billion in lost economic output. A report by America's Wetlands Foundation and the Entergy Corp., with the participation of global reinsurer Swiss Re, found that the Gulf Coast energy production region, extending from southern Texas to coastal Mississippi and Alabama, is vulnerable to growing environmental risk, with \$350 billion in cumulative losses expected by 2030, driven largely by land subsidence and increasingly severe storm events. The report recommends a number of cost-effective regional measures to address the increased risk, including strengthening building codes; improving environmental infrastructure such as beach nourishment, wetlands restoration and levee systems; improving resilience of electric utilities and measures specific to the oil and gas industry, such as improved standards for offshore platforms and levees for refineries and petrochemical plants. Even if these efforts were put in place, however, there would still be approximately \$14 billion in residual expected annual losses, only half of which would be covered by existing insurance. In a 2013 report prepared for the state Department of Natural Resources, the Louisiana Sea Grant Law and Policy Program concluded that requiring sea level rise and flooding be taken into account in siting decisions is critical to avoiding such damages and recommended the adoption of local regulations to ensure new development is not at undue risk from erosion, coastal land loss and storms. The report also recommended implementing hazard mitigation policies, reinforcing coastal wetlands, and requiring stricter planning and engineering before building new structures.

New York City's Ambitious Approach According to a U.S. Department of Commerce report, the estimated costs to repair and replace damage caused by Hurricane Sandy in lower New York and New Jersey were \$41.9 billion and \$29.5 billion, respectively. In the storm's aftermath, the New York State Legislature passed the Community Risk Reduction and Resiliency Act, which requires projects that receive state funding and permit approval to consider the impacts of climate change during the planning process. Developers submitting permit applications must include a detailed analysis of how a project will respond to climate risks such as sea level rise or severe storm events. New York City has launched the East Side Coastal Resiliency Project, jointly funded by the city and the federal government, an ambitious effort to reduce flood risk to Manhattan's East Side due to coastal storms surges and sea level rise. This project includes a system of 10-foot-high berms that will extend along the east riverfront for ap-

proximately two miles, while constructing waterfront park access improvements to avoid walling off the neighborhood. The East Side project is intended as the first piece of a larger effort to enhance coastal protection across the city, potentially including protection of the subway system from saltwater inundation. Restoring the subway to operation following Hurricane Sandy cost the city approximately \$600 million.

Conclusion Adapting to the challenges of climate change also presents opportunities for the private sector. Most obvious is the prospect of participating in the development and construction of large-scale infrastructure, such as New York's East Side Coastal Resiliency Project and levee improvements in Louisiana, which are directly aimed at enhancing climate resilience. But new projects of all kinds, not limited to climate-adaptive infrastructure itself, will be subject to the policies and programs discussed above, as well as others being developed in Florida, Maryland, Massachusetts, Washington and other states and localities. It will not be long before successfully navigating a major project to approval and implementation requires taking climate adaptation into account at all stages.

As noted above, a climate adaptation project is in many ways like any other project, but it is also different, in that its planning, purpose and need will incorporate resilience from the outset. In fact, achieving adaptation objectives could constitute a benefit that may offset or justify other environmental consequences of a project. Moreover, proponents of projects in vulnerable areas, such as coastal zones, may benefit from taking a proactive approach to climate adaptation as they contend with project opponents who formerly shunned the topic as a distraction from greenhouse gas reductions but may now embrace it as a brake on development.

By actively engaging with climate adaptation, companies with infrastructure-heavy and development-focused business models may be able to create valuable new ventures. Moreover, the evolving suite of government climate adaptation policies present "out of the box" frameworks that companies can build on to develop their own policies and approaches to account for climate change in their businesses and projects.

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