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The Municipal Market and Climate Change

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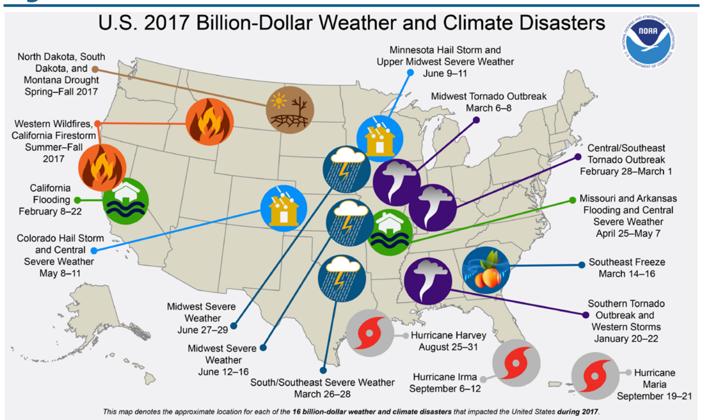
The effects of climate change will continue to have broad implications for the nation's economy, institutions and infrastructure. In 2017 alone, three major hurricanes (Harvey, Irma and Maria) struck the US and its territories, and destructive wildfires hit California. In recent years, severe droughts, tornados, blizzards, floods and heat waves impacted states throughout the country (see Figure 1). Recovery costs are growing exponentially with continued development in the areas most susceptible to natural disasters. Despite recent actions by the Trump administration de-emphasizing climate change initiatives, we believe all segments of the municipal universe, including state and local governments and utilities and transportation, should plan not only to protect against natural disasters but also to implement environmentally friendly policies to help prevent and reverse the effects of global warming. Significant capital is required to fund these initiatives, which will present opportunities for investors of municipal bonds. We incorporate environmental, social and governance (ESG) factors, in addition to fundamental research, when assessing the credit quality of municipal issuers. We believe the depth of our ESG analysis allows us to identify municipal issuers that are best positioned to withstand the negative consequences of climate change while also taking steps to reverse its effects.

Figure 1: Climate Disasters



Source: NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2018), https://www.ncdc.noaa.gov/billions/ accessed on March 22, 2018.

Federal versus State and Local Actions

Since his election in November 2016, President Trump has taken numerous actions against global efforts to fight climate change, specifically targeting agreements and regulations aimed at curtailing the production of greenhouse gas emissions. However, in the absence of federal action, we are seeing efforts to pursue environmentally friendly policies at state and local levels. When the federal government withdrew from the Paris Agreement, the governors of California, New York and Washington announced the formation of the United States Climate Alliance (see Figure 2). The goal of the Alliance is to reduce carbon emissions by 26% to 28% from 2005 levels by 2025 and to meet or exceed targets of the Paris Agreement. The Alliance plans to track and report progress to the global community, including at future Paris Agreement meetings. To date, Connecticut, Rhode Island, Massachusetts, Vermont, Oregon, Hawaii, Virginia, Minnesota, Delaware, Colorado, North

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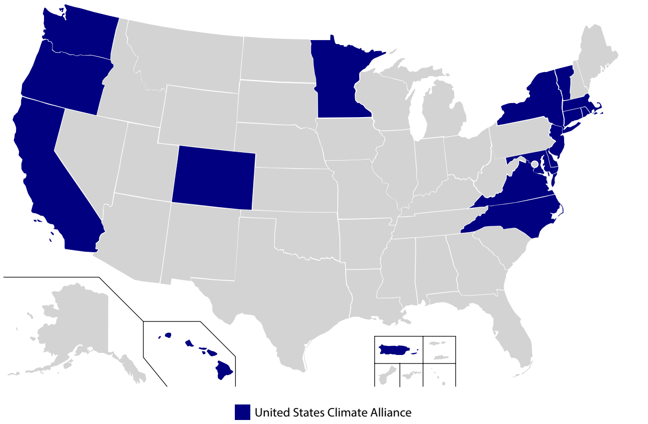
Carolina, Maryland and Puerto Rico have also joined. Combined, those states account for approximately one quarter of the country's carbon dioxide emissions, more than one third of the country's population and more than $7 trillion in economic activity.

Figure 2: United States Climate Alliance



Source: United States Climate Alliance, 2017 Annual Report: Alliance States Take the Lead.

Additionally, 392 mayors, representing more than one fifth of Americans, have signed the Mayors National Climate Agenda (see Figure 3), and more than 2,500 leaders from America's city halls, state houses, boardrooms and college campuses, which combined represent more than 127 million Americans and $6.2 trillion of the US economy, have joined the "We Are Still In" campaign. The Climate Alliance, Mayors Agenda and "We Are Still In" campaign indicate that the US will continue to move forward to combat climate change with or without the leadership of the federal government.

Figure 3: Members of the Mayors National Climate Action Agenda

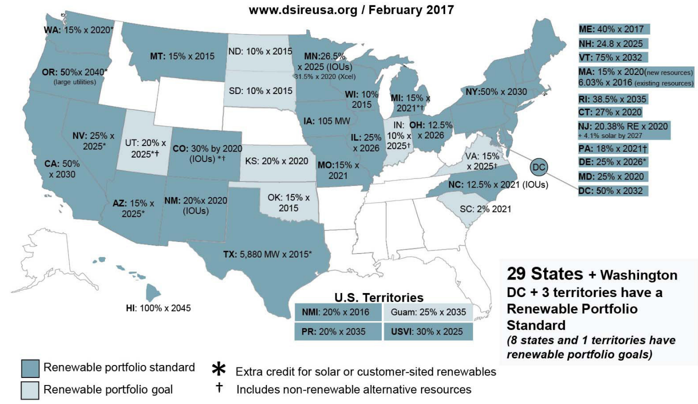
Source: Mayors National Climate Action Agenda, as of February 2018.

Renewable Portfolio Standards

One of the largest sources of pollution in the US is power generation via fossil fuels. Renewables, including wind, solar and hydro, have seen their market share grow in recent years, a trend that should continue. To date, 29 states, Washington D.C. and 3 territories have implemented Renewable Portfolio Standards that mandate set percentages of power generation from renewable sources by specified dates—all without direction from the federal government (see Figure 4).

An additional 8 states plus Guam have cleaner energy goals. The remaining 13 states, most of which are located in the southeast, have no renewable standards or goals. However, we believe it is just a matter of time before these states join the rest of the country, either via state or federal mandates.

Figure 4: Renewable Portfolio Standards



Source: Database of State Incentives for Renewables & Efficiency, as of February 2017.

Preparing for the Consequences

States are also considering how to be resilient in the face of the new climate challenges. Throughout the southwest, and particularly in California, longer and harsher droughts are increasingly prevalent. California issued limitations on water usage at various times, directly affecting the finances of water credits. New desalination technology is also being developed to diversify the state's water supply. Elsewhere, Hurricanes Harvey in Houston and Irma in Florida proved record setting in their destruction. Similar to New York City after Superstorm Sandy, these regions will have to harden their infrastructure. Levies and seawalls may be needed in low lying areas to hold back rising sea levels and more extreme storm surges. As state and local governments rebuild and adapt, it will be increasingly prudent to renew their emphasis on protecting against future extreme weather events. As we have seen in prior disasters, municipalities may need to rely on internal liquidity, and possibly additional borrowing, to cover the cost of cleanup efforts prior to the receipt of federal aid and insurance reimbursements. Municipalities that have built up their rainy day reserve funds should be well positioned to navigate the challenges present in the early days of the recovery. Despite near-term disruption, we expect most of the affected municipalities to experience longer-term economic growth as they invest in rebuilding.

Recommendations

We factor in the effects of climate change in our ESG review process for municipal issuers, in addition to our fundamental credit research. We consider environmental regulations in the public power sector and generally favor credits with higher concentrations of clean power and/or lower concentrations of coal-fired generating facilities. In the transportation sector, we scrutinize how new investments will impact balance sheets and pay special attention to credits with an eye on the future of cleaner transportation methods. In the state and local sector, we study unique environmental threats across different geographies, including droughts, flooding and hurricanes. Whether rebuilding from extreme weather events, hardening systems or combating climate change, municipal issuers will need to finance large, environmentally friendly projects with new debt. We believe we are well positioned to understand and evaluate the impact of climate change on the municipal market.

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