

AMERICA'S LOW-CARBON FUTURE

**A "BOTTOM-UP"
OPPORTUNITY AGENDA
FOR CLIMATE ACTION
IN THE UNITED STATES**

AMERICA'S PLEDGE



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In the United States, opportunities for climate leadership exist at every level of governance. Despite the inaction on climate change within the federal government, it is the actions taken by communities, day-to-day investment decisions made by businesses, local solutions implemented by mayors and city councils, and win-win energy and environmental policies set by state governors and legislatures that are laying the groundwork for America's low-carbon future.

Whether such decisions are taken primarily for reasons related to the global climate, to protect public health, or because they make economic sense, the thousands of decentralized and bottom-up actions of American businesses, cities, and states have already significantly influenced the trajectory of U.S. greenhouse gas emissions over the near- to medium-term. Although some of these actions occur under the radar, they make a significant impact on the global emissions trajectory.

In light of President Trump's announcement that he intends to withdraw from the Paris Climate Change Agreement and roll back key elements of his predecessor's Climate Action Plan, we believe that a decentralized, bottom-up agenda for U.S. climate action is not only achievable, but in fact already exists and is being implemented quietly and swiftly.

The 10-part "Opportunity Agenda" contained herein previews a more detailed analysis of these actions and their potential that will be released later this year at the Global Climate Action Summit. It covers a wide range of existing policies, programs, and initiatives led by U.S. businesses, cities, colleges & universities, and states regardless of the rhetoric or even the policy decisions emanating from the federal government. In the weeks, months, and years ahead, U.S. nonfederal leaders can do much more to build upon the successes already captured in these 10 areas.

From supermarket chains phasing out super-polluting refrigerant gases on a more accelerated timeline, to cities pooling their buying power to spur demand for electric vehicles, to states collaborating on policies that store carbon in soils, there is plenty of meaningful action available for U.S. climate leaders to enact. This Opportunity Agenda identifies some of the best levers for nonfederal climate action.



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INTRODUCTION

Following President Trump's June 2017 announcement to withdraw the United States from the Paris Agreement, the response from across the United States was swift and significant. An unprecedented coalition of cities, states, businesses, universities, and others announced their continued support for the agreement and pledged to take action to ensure the United States stays on track to achieving the U.S. emissions reduction target. National governments across the world rallied behind the Paris Agreement as well, demonstrating a robust, sustained, and unshakeable consensus for climate action.

A month later, in July 2017, former New York City Mayor Michael Bloomberg and California Governor Jerry Brown launched America's Pledge, an initiative to analyze, catalyze, and showcase climate leadership by U.S. governors, mayors, and CEOs. In November 2017, Bloomberg and Brown released a comprehensive survey of U.S. climate action led by states, cities, and businesses at the UN Climate Conference in Bonn, Germany. This report helped solidify international understanding of, and confidence in, U.S. climate action by showing that real economy actors outside the federal government representing more than half the U.S. economy—equivalent to the third largest country in the world—remain committed to the Paris Agreement and are already driving decarbonization forward.

However, meeting the ambitious goals of the Paris Agreement—limiting global temperature rise to well below 2 degrees—will require bolder action at a faster pace by a broader range of real economy actors. In the United States, a lack of federal leadership has made the path forward unclear, particularly in the critical pre-2020 window, when policy and investment decisions will set the trajectory of decarbonization for decades to come.

At the 2018 Global Climate Action Summit, to be held in San Francisco in September, Governor Brown and Mike Bloomberg will release a first-of-its-kind bottom-up climate action quantitative analysis. It will model the entire American economy, laying out how states, cities, businesses, and other real economy actors can take charge of U.S. decarbonization and accelerate further progress in the near-term while the federal government remains stagnant on climate action.

The report, building on this bottom-up opportunity agenda, details:

1. **Existing commitments and their impact:** How real economy climate commitments are driving U.S. economy-wide emissions reductions;
2. **Opportunities for high ambition:** A roadmap of opportunities for governors, mayors, and CEOs to lead climate action while advancing the interests of their residents, customers, and shareholders;
3. **Emissions analysis:** Projected U.S. emissions trajectories through 2025 and 2030 resulting from existing real economy commitments, potential incremental emission reductions, as well as from eventual renewed federal engagement; and
4. **Leadership case studies:** How some of America's most innovative states, cities, and companies are delivering on their existing commitments and showing the way for their peers.

WHY REAL ECONOMY ACTORS CAN LEAD THE WAY

Tackling global climate change demands a multistakeholder partnership and deep collaboration between national governments and their broader societies: states, cities, businesses, universities, communities, and other real economy actors whose decisions shape greenhouse gas emissions, drive innovation, and are determinative of the speed and direction of the global low-carbon energy transition. While nonfederal actors matter in every country, this kind of decentralized climate leadership is critical in the United States because bottom-up action has been the most powerful driver of major economic and social transitions in American history. Specifically:

STATES

Control many of the most powerful climate policy levers, from renewable portfolio standards to air pollution regulations. States will often take after their peers: early mover states typically demonstrate successful models and then engage others to follow. Supreme Court of the United States Justice Louis Brandeis famously called states the “laboratories of democracy” due to their ability to innovate and experiment with diverse policy solutions. This is true of energy and climate as much today as it was true of leading public policy issues in his time nearly 80 years ago.



CITIES & COUNTIES

Control city planning, building standards and permits, public transportation, waste management and zoning, all critically important to climate mitigation. Increasingly they seek to serve their populations by exercising greater control over such economic factors as the sources and prices of electricity, modes of transportation, and climate resilience. In particular, large cities and counties represent sizable shares of state and regional economies, taxes, and energy demand. Indeed, the largest 25 urban areas in the United States account for 46% of total GDP,¹ and 6% of climate emissions.²



BUSINESSES

Do not set public policy; however, they will direct or influence much of the carbon-emitting asset base (energy, industry, and buildings) across wide swaths of the economy. Business leadership and policy often affects operations across multiple facilities, setting the terms of engagement for complex and multilayered supply chains across a large geographic scope, often spanning many states and even multiple countries. Businesses consume a substantial share of the nation's energy and can make decisions about how to source electricity and heat. They can heavily influence transportation-related CO₂, methane, and hydrofluorocarbon (HFC) emissions as well.



¹ Bureau of Economic Analysis, Gross Domestic Product by Metropolitan Area, 2016.

² Department of Energy, State and Local Energy Data resource.

10 HIGH IMPACT CLIMATE ACTION STRATEGIES FOR STATES, CITIES, AND BUSINESSES

In its bottom-up climate action plan, the America's Pledge initiative models the emissions impact of a specific set of strategies for sectoral transformation in electricity, buildings, transportation, HFCs, methane, natural lands, and economy-wide carbon pricing. Central to this are **10 high-impact opportunities for near-term, nonfederal** emissions reduction opportunities. These are areas where intensified engagement by states, cities or businesses can significantly contribute to the overall U.S. decarbonization pathway over the coming years. These 10 opportunities are previewed here.

1. **DOUBLE DOWN ON RENEWABLE ENERGY TARGETS**
2. **ACCELERATE THE RETIREMENT OF COAL POWER**
3. **RETROFIT BUILDINGS AT KEY TRIGGER POINTS**
4. **ELECTRIFY BUILDING ENERGY USE**
5. **ACCELERATE ELECTRIC VEHICLE ADOPTION**
6. **PHASE OUT SUPER-POLLUTING HFCs**
7. **STOP METHANE LEAKS AT THE WELLHEAD**
8. **REDUCE METHANE LEAKS IN CITIES**
9. **REGIONAL STRATEGIES FOR CARBON SEQUESTRATION IN NATURAL AND WORKING LANDS**
10. **STATE COALITIONS FOR CARBON PRICING**

ELECTRICITY

2016 GHG Emissions
(MMT CO₂e)



28% (1842 MMT CO₂e)

Generating the electricity needed to power U.S. homes and businesses, manufacture goods, and—increasingly—electric vehicles is responsible for 28% of U.S. greenhouse gas emissions. The power sector has made significant progress cutting carbon pollution in recent years by retiring coal plants, replacing them with natural gas and renewables, and continuing to advance the efficiency of buildings. As a result, power sector carbon dioxide emissions have declined by 28% since 2005,³ and is on-track to meet the goal's of President Obama's Clean Power Plan ahead of schedule.

More opportunities remain. 42% of the country's electricity consumption occurs in the more than 1,400 cities that are a part of the U.S. Conference of Mayors,⁴ and 31% of the nation's power is consumed in states that have joined the U.S. Climate Alliance, which is committed to the Paris climate goals.⁵ Despite the rollback of the Clean Power Plan, the first-ever federal limit on carbon pollution from power plants, U.S. states, cities, and businesses have the resources at their disposal to significantly scale renewable power generation and accelerate the retirement of coal-fired electricity generating units, two of the most important changes needed for continued emissions reductions. Perhaps as important, there is economic motivation, as low-carbon electricity is cheaper, better for the health of their citizens, and an increasing competitive advantage in attracting business.

³ U.S. Energy Information Administration, "Table 12.6 Carbon Dioxide Emissions From Energy Consumption: Electric Power Sector," Monthly Energy Review, May 2018, https://www.eia.gov/totalenergy/data/monthly/pdf/sec12_9.pdf

⁴ EESI. Fact Sheet - The U.S. Climate Alliance and Related Actions, August 14, 2017, <http://www.eesi.org/papers/view/fact-sheet-the-u.s.-climate-alliance-and-related-actions>.

⁵ U.S. Energy Information Administration, America's Pledge analysis.

01.

DOUBLE DOWN ON RENEWABLE ENERGY TARGETS

Renewable energy targets are a critical lever for climate action—e.g., 29 states of all political stripes have already set renewable portfolio standards. These policies have been a critical driver of demand for solar and wind energy over the past years, ensuring steady market growth for cheaper, cleaner sources of energy. Increasingly, cities and businesses are setting ambitious renewable energy targets of their own, achieving them either through power purchase agreements, the negotiation of specific markets, or other strategies that increase the demand for clean electricity. When cities, state policymakers, corporate renewable energy buyers, and utility companies work together to develop integrated strategies across stakeholder groups, they can drive progress even faster. Ratcheting up renewable energy commitments at a time of plummeting solar and wind costs and rapid evolution of business model solutions represents a major portion of the overall potential within the electricity sector.



CASE STUDY



The Renewable Energy Buyers Alliance (REBA) is a collaborative effort led by four non-profit organizations to accelerate and scale procurement of renewable energy. REBA exists to help energy buyers like corporations, cities, and public institutions power their operations with clean energy by helping them understand the benefits of moving to renewables, connecting large buyer demand to renewable energy supply, and helping utilities better understand and serve the needs of all energy buyers. REBA brings together all market actors through annual gatherings and monthly calls to collectively overcome the largest barriers to meeting ambitious renewable energy targets. Today, over 250 companies and institutions work participate in REBA to accelerate the transition in the energy sector towards a low carbon future. Since 2013, these organizations have announced over 12GW of new renewable energy capacity.

Salesforce, one organization participating in REBA, is more than halfway towards their goal of matching 100% of their global electricity use with renewable energy. The majority of that progress has come from Virtual Power Purchase Agreements in West Virginia and Texas, as well Renewable Energy Tariffs. Moving forward they're focused on building a diverse portfolio of renewable energy projects which minimize risk and maximize emissions reductions. However they recognize that matching electricity use is only an initial step towards the long term goal of shifting the worlds power supply completely to clean energy resources. To reach that long term goal Salesforce relies on collaboration through groups like REBA to affect change on a global scale.

“At Salesforce, we believe the business of business is improving the state of the world and now more than ever we are seeing the growing demand for companies to take initiative and tackle climate issues. **Salesforce is committed to creating a sustainable, low-carbon future by integrating sustainability throughout our business.** This includes managing our own environmental footprint and leveraging the power of our organization as we continue to grow.”



Patrick Flynn,
*Senior Director of
Sustainability, Salesforce*

02.

ACCELERATE THE RETIREMENT OF COAL POWER

Coal was an engine of American economic growth 100 years ago, but its role in the modern economy is ending as cheaper, cleaner sources of energy win out in the market. Because coal is the single largest source of carbon pollution per unit of energy, and coal-fired power plants contribute a significant share of conventional air pollutants such as sulfur dioxide, nitrous oxide, particulate matter, and mercury, coal plants are often uneconomic to run when forced to internalize the costs of this pollution via the installation of scrubbers and other costly pollution-control equipment. Since 2010, due in part to an unparalleled public campaign led by the Sierra Club, America's oldest and largest environmental organization, 270 coal-fired power plants have either been fully retired or their retirement has been proposed. Markets are now driving this process, as Bloomberg New Energy Finance estimates that over 50% of the remaining U.S. coal fleet is financially unstable. However, plants in certain regulated markets can remain in use even when they lose money, with ratepayers footing the bill. Consequently, the pace of retirements remains too slow to reach our U.S. and international climate goals. Working together, states, cities, businesses, and other stakeholders can accelerate retirements between 2018 and 2025 and help reach the level needed to keep the United States on a pathway to 2°C.



CASE STUDY



After years of coordinated advocacy and sustained organizing, Colorado's **Xcel Energy** utility announced plans in June 2018 to implement the single largest national proposal to replace retiring coal power with renewable energy in American history. Xcel plans to accelerate retirement of one-third of its coal fleet, replace that with major new additions of wind, solar, and battery storage, and add no new gas-fired generation, bringing the utility's portfolio to 55% renewable energy. In their request for proposals for this plan, Xcel received the lowest bids for wind and solar ever received by any U.S. utility, and this shift will save their customers an estimated \$215 million. The utility is also investing in an economic transition pathway for the community that is home to the coal-fired power plants, largely due to advocacy from thousands of their customers sending comments and attending hearings to demand this change. The cities of Pueblo, Aspen, and Boulder have all declared their commitment to meet 100% of their electricity needs with the low-cost clean energy sources that already employ more Coloradans than coal and gas combined.

Here's the Xcel plan by the numbers:

- Construct 1,131 megawatts (MW) of new wind power, 707 MW of new solar power, and 275 MW of new battery storage.
- Accelerate retirement of 660 MW of its coal-fleet (about one-third of its Colorado fleet).
- Include purchase of 383 MW of existing gas plants, but no new gas construction.
- Increase its share of renewable energy in Colorado from about 29% to more than 50% by 2026.
- Reduce its carbon emissions by 59% as compared to a 2005 baseline.
- Result in at least \$213 million in savings as compared to continued operation of all Comanche coal-fired generation units.

“Accelerating coal plant retirements and replacing that coal with clean energy is the biggest immediate opportunity we have in the U.S. to reduce climate pollution, and grassroots advocates are seizing that opportunity. **Thanks to a decade of advocacy, we’ve already won retirement of over half the coal plants in the U.S., and this spring, coal power generation fell to an all-time low, while wind and solar reached an all-time high.** In the U.S., decisions about how we produce electricity are made in states and cities, not in Washington, DC, and the Beyond Coal Campaign will continue to be there whenever and wherever those decisions are made. No matter who is in the White House, we will keep making progress toward moving America off of dirty coal and toward 100% clean energy.”



Mary Anne Hitt,
*Director of the Sierra Club
Beyond Coal campaign*

BUILDINGS

2016 GHG Emissions
(MMT CO₂e)



8% (524 MMT CO₂e)

Commercial and residential buildings are the source of 28% of U.S. emissions, which includes 8% of U.S. emissions from direct fuel use and 20% from electricity use. Slashing these emissions by 15% through energy efficiency and clean energy supply would save a cumulative 1.9 billion tons of carbon dioxide equivalent through 2025. Utilities, cities, and states each play a significant role in advancing these solutions:

- **Utilities** largely manage energy efficiency program design and implementation, including providing incentives and raising awareness.
- **Cities** direct policies and regulations for building standards, in particular setting codes for new construction and larger retrofits of existing buildings.
- **States** set overall direction through state energy policy and strategy, appliance standards, regulation of utilities and, in some cases, building codes.

03.

RETROFIT BUILDINGS AT KEY TRIGGER POINTS

New homes and commercial properties are getting more energy efficient, but addressing the carbon footprint of existing buildings is a more significant challenge. Fortunately, advances in technology and business models have opened new opportunities to implement building retrofits in cost-effective ways, including for rental properties. Federal policy is not needed to achieve major progress: local governments, real estate companies, and utilities can come together to implement new programs and policies to maximize carbon savings achievable through retrofits.



CASE STUDY



Retrofit Chicago is a voluntary program that encourages and promotes energy efficiency in buildings. The program includes all building types—from small residential properties (single-family homes and small multifamily buildings) to larger properties such as offices, hotels, college buildings, large multifamily buildings, nonprofit office space, and houses of worship. Under Retrofit Chicago, the city is also improving the efficiency of its own buildings and has reduced energy use by approximately 18% across 60 city-owned properties. The portion of the program addressing larger buildings has also achieved approximately 18% energy reduction in 88 participating buildings, spanning over 56 million square feet of space.

Building on the success of this program, as well as the city's mandatory energy benchmarking requirement—which establishes a common reporting standard on energy efficiency data—for large properties, Chicago will begin assigning a building energy rating of between zero and four stars to all properties over 50,000 square feet, starting in 2019. Property owners will be required to post their ratings in a prominent location and to share it at the time of listing for sale or lease. The new Chicago Energy Rating System is expected to increase the transparency and simplicity of energy information reported under the Chicago Energy Benchmarking Ordinance.

“While the Trump administration continues to deny the reality that environmental and economic interests go hand in hand, America’s Pledge is helping to unite local leaders who believe in clean air, clean water, and preserving our natural resources for future generations. In Chicago, we will continue to invest in sustainability initiatives that improve our environment, support 21st century jobs and lead us on the path to eventually **powering all of Chicago with 100% clean energy.**”



Rahm Emanuel,
Mayor of Chicago

04.

ELECTRIFY BUILDING ENERGY USE

Americans currently burn large quantities of fossil fuels directly in our homes and commercial businesses, resulting in over 500 million tons of carbon pollution per year. Shifting to electricity to provide heating and cooling needs is a powerful opportunity to cut carbon pollution, particularly when combined with continuing to clean the electricity grid itself. States, cities, and utilities can collaborate to electrify building energy use by evaluating local or regional potential from a technical and economic standpoint, setting targets backed by policies or regulations in relation to new appliance and building standards, and implementing programs to encourage retrofits, such as through utility, state, or municipal rebates for electric hot water heaters.



CASE STUDY



With mounting evidence that the use of methane (the main component of natural gas) may equal or exceed coal in its climate-damaging impacts, **Boulder, Colorado** has helped launch a multicity initiative to rapidly transition buildings off their dependence on natural gas for space and water heating. A primary strategy is the electrification of existing natural gas uses with high-efficiency heat pumps. A consortium of over 20 cities including Boulder; New York City; San Francisco; Seattle; Salt Lake City; Palo Alto, California; Burlington, Vermont; Washington, DC; and others has initiated a broad public-private collaboration working with most of the world's major heat pump manufacturers, as well as suppliers and installers in the HVAC industry, to develop policy, market infrastructure, and financial mechanisms to facilitate this rapid transition. Boulder has set an ambitious goal to transition over 80% of its residential building stock to high-efficiency heat pumps by 2050.

“Local action on climate is more important than ever and we will continue to work with cities throughout Colorado and the nation to lead on climate. **Boulder’s Climate Commitment goals set greenhouse gas reduction targets that exceed those outlined in the Paris Climate Agreement.** We will continue on our path to significantly reduce our city and community emissions.”



Suzanne Jones,
*Mayor of
Boulder, Colorado*

TRANSPORTATION

2016 GHG Emissions
(MMT CO₂e)



28% (1805 MMT CO₂e)

The transportation sector recently surpassed the power sector as the single largest source of U.S. greenhouse gas emissions at 28%, due in part to the retirement of coal-fired power plants and the rebound of vehicle miles traveled after the Great Recession. There is significant momentum towards the development of a more fully electrified, and therefore cleaner, road transport system.

Other strategies to cut emissions from transportation include shifting from continued urban sprawl to urban densification; expanding public transportation networks, ridesharing, and alternative modes of transportation to reduce vehicle miles traveled; converting from petroleum-based vehicles to those running on low-carbon fuels such as carbon-beneficial biofuels or green hydrogen; improving fuel economy of conventional fossil-fuel based vehicles; and reducing freight emissions through improved efficiency of heavy-duty vehicles, aircraft, and transportation networks.

About two-thirds of the miles travelled by American drivers are in urban areas,⁶ where there is the greatest opportunity for replacement with mass transit, shared fleet vehicles, and the increasingly important electrification of vehicles. Fortunately, primary decision-making authority to transform our transportation system rests with nonfederal leaders. Local and regional governments set land-use policy and fund public transportation systems. Businesses and non-federal government entities manage large vehicle fleets and have grown their influence by developing new transportation businesses models. While the federal government has an important role in setting overall greenhouse gas and efficiency standards, known as Corporate Average Fuel Economy, or CAFE, standards, states like California and partnering states can set their own vehicle emissions standards. California has been joined by twelve states in adopting its strict Clean Car standards, and together they represent over one-third of the U.S. vehicle market.

⁶ Brookings Institute, *The Road...Less Traveled: An Analysis of Vehicle Miles Traveled Trends in the U.S.*, 2008.

05.

ACCELERATE ELECTRIC VEHICLE ADOPTION

U.S. Light Duty Electric vehicles (EV) sales are steadily growing, from 50,000 in 2012 to now over 850,000 sold in the U.S. market. The number of EV models on the market is on track to double between 2016 and 2020 and is expanding to all vehicle classes and market segments—light duty trucks, commercial delivery vehicles, transit buses, and even semi-trucks. This growth and expanded vehicle availability is impressive, but market penetration is still tracking well below the rate needed to put a dent in the greenhouse gas emissions of the U.S. transportation sector. States, cities, corporate fleet owners, utilities, vehicle manufacturers, transportation network companies and other private sector innovators have the power to substantially increase the rate of EV deployment, particularly when they work together. States can set and expand proactive zero emission vehicle (ZEV) policies and regulations. Cities and corporate fleet owners can collaborate on group procurement models, expand education and awareness programs, and support coordinated and accessible charging infrastructure.



CASE STUDY



In Los Angeles, Mayor Eric Garcetti pioneered **BlueLA**, the nation's first all-electric carshare program designed to serve low income residents. BlueLA exemplifies a successful public-private partnership with a comprehensive community outreach and engagement process. The program is a unique blend of leveraged funds from California's Cap-and-Trade program, a local city match, and the backing of a committed carshare operator identified through a competitive solicitation to the private sector. With stations located throughout some of LA's most disadvantaged neighborhoods, members of the local community are employed by BlueLA to lead on outreach and education. The program is expected to take at least one thousand vehicles off the road by 2020 while saving Angelenos money and giving them high quality, affordable, and clean mobility options.

"Here in Los Angeles, **sustainability isn't just an issue area—it's a value that guides everything we do.**

From building the largest public EV charging network in the country to offering new greenhouse gas-free mobility options to Angelenos, we know the climate leadership we show today will protect public health, drive innovation, and grow our economy."



Eric Garcetti,
Mayor of Los Angeles

HYDROFLUORO-CARBONS (HFCs)

2016 GHG Emissions
(MMT CO₂e)



2% (159 MMT CO₂e)

Hydrofluorocarbons are potent climate pollutants used in air conditioners, refrigerators, aerosol cans, insulating foams, and other products Americans use nearly every day. While HFCs currently make up only 2% of total U.S. greenhouse gas emissions, molecule-for-molecule they are many thousands of times more potent than carbon dioxide, and their global use is growing rapidly. Unfortunately, domestic progress has stalled, with the U.S. Congress yet to ratify the Kigali Agreement, and with portions of the U.S. Environmental Protection Agency's authority partially vacated by the courts. This outcome places greater importance on nonfederal actors to fill the ambition gap and forge ahead on key actions to cut these harmful pollutants.

Fortunately, U.S. companies like Chemours and Honeywell have taken the global lead in developing climate-friendly refrigeration technologies that have enabled the world to phase out the use of HFC's. Supermarket chains have stepped forward by participating in EPA's GreenChill program to reduce their emissions through actions such as addressing leaks, upgrading equipment, and switching to refrigerants with lower global warming potentials. Commitments to reducing their HFC emissions have been made by 43 supermarket chains, representing over 10,000 individual stores, or about 28 percent of all stores in the United States.⁷ GreenChill partners have, on average, reduced their leakage rates about 44 percent compared to a typical supermarket.⁸ As of March 2018, 215 stores are certified as having achieved even greater emission reductions.

⁷ https://www.epa.gov/sites/production/files/2017-09/documents/gc_recognition.presentation.2017_ceremony.pdf

⁸ https://www.epa.gov/sites/production/files/2017-09/documents/gc_recognition.presentation.2017_ceremony.pdf

06.

PHASE OUT SUPER-POLLUTING HFCS

While the Kigali Amendment to the Montreal Protocol on phasing down super-polluting HFCs was negotiated among nations, California's March 2018 SNAP rule demonstrates the ability of states to drive progress themselves. California has set out to reduce HFC emissions 40% by 2030 from 2013 levels in supermarkets and other refrigeration uses. Its recent ban on the use of HFCs in certain sectors would prevent 2.7 million tons of CO₂-equivalent emissions annually by 2025. These rules can also be expanded to cover additional end-uses, including aerosols. A group of 16 U.S. states and Puerto Rico, organized under the banner of the U.S. Climate Alliance, released a statement of its commitment to reducing short-lived climate pollutants in June 2018. The group could adopt the California SNAP standards on HFCs. Collaborative campaigns involving states, cities, and supermarket chains can encourage additional commitments across the supermarket industry.



CASE STUDY



After a federal court blocked a portion of EPA's authority to regulate HFCs, the California Air Resources Board (CARB) was left in a bind because of their reliance on the EPA's Significant New Alternatives Program rules to help meet California's preexisting emission reduction goals for HFCs, which in turn are important to ensure California ultimately meets its larger climate goals. "As a result of the recent court decision, **California had to pass its own regulation** to ensure it could meet these goals," CARB said in a statement.

The regulation it promulgated in March of 2018 affects certain stationary refrigeration and foam end-uses. It preserves emission reductions from specific sectors with past or shortly upcoming compliance deadlines and will "prevent manufacturers from backsliding or start using high-global warming HFCs again," according to the CARB statement. The regulation applies mainly to equipment manufacturers, which cannot use prohibited HFCs in new refrigeration equipment or foams.

Prohibited HFCs cannot be used in new equipment and materials in California for the following end-uses:

- Supermarkets and remote condensing units used by convenience stores;
- Refrigerated food processing and dispensing equipment, such as Slurpee machines and frozen yogurt dispensers;
- Stand-alone, or small self-contained refrigeration units;
- Refrigerated vending machines; and
- Foams used in buildings and other places.

It also requires that they have a disclosure statement that certifies that products use only compliant refrigerants or foam expansion agents.

“Washington may have dropped the ball on curbing HFCs, but **leading states can keep industry on track** to replace these super-potent heat-trapping pollutants with safer alternatives—benefitting our health and the climate.”



David Doniger,

*Senior Strategic Director of NRDC's
Climate and Clean Energy Program*

OIL & GAS METHANE

2016 GHG Emissions
(MMT CO₂e)



4% (258 MMT CO₂e)

Methane is the primary component of natural gas, and its uncontrolled release from pipelines and other gas distribution infrastructure has significant climate and safety implications given its strength as a heat-trapping atmospheric gas 34 times more potent than CO₂. Methane has multiple sources, including livestock, landfills, coal mines, and rice cultivation, but oil and gas production and distribution is the fastest-growing source of methane emissions. Emissions from oil, gas, and coal extraction and distribution are responsible for 4% of overall U.S. greenhouse gas emissions, which equates to over 250 million tons of carbon dioxide equivalent annually.

Methane leaks are a problem both at the wellhead and in gas distribution systems. States have been working in recent years to establish standards for oil and gas wells to upgrade equipment and limit fugitive methane leaks. In addition, recent advancements in technology, led by collaborations between industry, local policymakers, and technology providers, are making leak detection cheaper and more effective. And individual oil and gas companies have stepped forward, demonstrating to the industry as a whole that curbing methane leaks can be a viable business decision as well as an important safety and climate precaution.

07.

STOP METHANE LEAKS AT THE WELLHEAD

Recent scientific studies have shown that methane leaks associated with the exploration, production, and distribution of oil and especially natural gas are far higher than estimated. But those studies also show that, because of the value of natural gas recovered, simple leak detection and repair strategies can cut over 40% of these emissions. California, Colorado, Wyoming, Pennsylvania, Ohio, and Utah have put in place regulations or permitting programs to address methane emissions from oil and gas production facilities. There is an opportunity for other states to follow in their footsteps and drive action on methane now. In addition to the climate benefits, such states also increase their production of natural gas, with the royalties and tax revenues that it brings. In support of adopting state-level standards, collaborations among nonfederal actors can develop and pilot innovative approaches to detect and repair leaks at oil and gas exploration and production sites.



CASE STUDY



Even while the Trump Administration attempts to repeal federal protections on oil and gas methane emissions, states are moving forward. Last June, **Pennsylvania** Governor Tom Wolf delivered on a key promise, enacting general permit conditions for new well sites and major emissions sources in the midstream sector. As the second-largest gas producing state in the nation, this move is critical not only for the tons of pollution it will prevent from escaping into the atmosphere but also for its value in demonstrating that methane solutions are both cost-effective and politically feasible. Governor Wolf has also committed to proposing new rules for existing sources in 2018, protections that are sorely needed to ensure pollution from the roughly 70,000 wells already operating in the Commonwealth do not go unaddressed.

“Governor Wolf has faced some tough opposition, notably in the state legislature—but he has come through on this important commitment. It’s a testament to his tenacity and a proof point that, even in a state that depends on traditional energy industries, **voters care about climate.**”



Mark Brownstein,
*EDF Associate
Vice President*

08.

REDUCE METHANE LEAKS IN CITIES

Much of natural gas distribution infrastructure exists underground in large cities and is controlled by local utilities supplying natural gas for heating, cooking, and other energy uses. Detecting and repairing leaks in this vast system can be difficult and costly. But through the use of innovative technologies, improved partnerships, and advanced analytic methods, including leak quantification, nonfederal actors can revolutionize the way utilities repair and abate leaks—driving down the cost of detection and repair while achieving greater reductions. Working with urban gas distribution utilities in the eight leakiest states, which account for 85% of leak-prone pipe (California, Michigan, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, and Texas), cities, utilities, and commercial service providers can develop and implement plans to use advanced leak detection and data analytics (ALD+) to identify and abate the largest leaks.⁹ Because a large fraction of this gas flows from a small number of very large “super leaks,” local leadership is ensuring that these leaks are repaired to reap important and immediate nonclimate benefits.



⁹ PMHSA 2016 Data, America's Pledge Analysis

CASE STUDY



Persistent, non-hazardous leaks are a ubiquitous problem in many urban gas distribution systems—with leaks often going unaddressed for years because they don't present an immediate danger to people or property. Using advanced analytics and leak data collected by Google Street View vehicles outfitted with methane detection sensors, **PSE&G**—New Jersey's largest natural gas utility—was able to identify and prioritize replacement of its highest emitting areas, leading to an 83 percent reduction in methane emissions by replacing one-third fewer miles of pipe than would have been required using traditional survey and repair methods.

“PSE&G, working with EDF and Google, pioneered the use of advanced leak detection methods by using methane emissions data to help prioritize our pipe replacement efforts on the areas most in need. **Targeting and accelerating the replacement of our aging pipes provides benefits for our customers, the economy and the environment.**”



Jorge L. Cardenas,
*PSE&G Vice President,
Asset Management*

NATURAL LANDS

America's natural lands play an important role in absorbing and sequestering carbon while also providing important ecosystem services. Today the land sector sequesters over 10% of total U.S. greenhouse gas emissions. It is estimated that the United States could bolster its land-sector sink to sequester an additional 1 gigaton of carbon dioxide (GtCO₂) per year—the equivalent of 15% of annual U.S. greenhouse gas emissions.

09.

REGIONAL STRATEGIES FOR CARBON SEQUESTRATION IN NATURAL AND WORKING LANDS

States and businesses, nurtured with support from coalitions of philanthropies and NGOs, can spark regional initiatives appropriate to the variety of ecosystems that span the North American continent. If successful, these regional initiatives could become a focal point for future federal policy, while providing significant benefits for rural economies, agricultural productivity, water resources, natural habitat, and recreation. Deploying carbon-beneficial practices across a large majority of U.S. forestlands, croplands, and grazing lands will require improved data, new monitoring systems, and scalable incentive mechanisms to elevate deployment from one-off transactions at the farm- or forest-level to efficient landscape-level programs.



CASE STUDY



Forests present the largest opportunity for carbon sequestration in the North American land sector, and currently absorb and sequester 10% of total U.S. carbon emissions each year. Of the 750 million acres of forests in the U.S., over half is privately owned, with 61% of private ownership (265 million acres) in the hands of individuals and families in tracts over 10 acres in size. Unfortunately, the U.S. is slowly losing its forests, and many remaining forests are in a degraded state due to unsustainable harvesting, forest health issues including fires, and expanding development.

In partnership with a wide range of private landowners, the Nature Conservancy (TNC) of Pennsylvania launched a new program, **Working Woodlands**, in 2009 to accelerate large-scale forest protection and sustainable management by offering a new value proposition to forest landowners through forest certification and carbon markets. The Pennsylvania Working Woodlands program targets key landowner segments with a value proposition that includes forest protection in the form of a working forest easement and agreement, Forest Stewardship Council (FSC) certification and access to carbon markets. This model can help landowners achieve higher performing forests, with better growth rates that produce higher value wood products. Meanwhile, the forest is able to capture and store more carbon through improved forest practices. The additional carbon is quantified, verified and sold to organizations or companies that wish to offset their carbon footprint, and the majority of the benefits flow to the landowner.

To date, in Pennsylvania alone over 62,000 acres have been protected, restoration has been accelerated on 5,000 acres, and almost 3.5 million tons of carbon will be sequestered over the life of the projects. Now, the model has been implemented in Tennessee, Michigan, and New York, with 8 other states in early stages of project development. TNC aims to have 1 million acres in the program by 2025, sequestering an estimated 50 million tons over the life of the projects.

“Natural climate solutions offer enormous potential across each and every state of the U.S.; sequestering more carbon in our natural and working lands can also create rural jobs and support livelihoods, clean our water and air and help halt biodiversity loss.”



Josh Parrish,

*Director, The Nature Conservancy
Working Woodlands Program*

ECONOMY-WIDE CARBON PRICING

Beyond sector-specific approaches, an economically efficient way to reduce emissions is to set economy-wide prices on greenhouse gases through mechanisms such as cap-and-trade, and carbon taxes or fees.

While sector-specific policies will deliver significant emissions reductions, they inherently fail to cover all sectors of the economy or fail to account for shifts in emissions between sectors. Market-based policies such as cap-and-trade allow for trading between entities, which helps identify the least-cost mitigation opportunities.

2016 GHG Emissions
(MMT CO₂e)



Total: 6,512 MMT CO₂e

10.

STATE COALITIONS FOR CARBON PRICING

States can work together to establish legally enforceable economy-wide limits on carbon pollution, with emission targets consistent with the objectives of the Paris Agreement. These policies may be implemented through emissions trading or another form of carbon pricing, and planners should look to existing successful policy frameworks such as California's cap-and-trade initiative and the Regional Greenhouse Gas Initiative (RGGI) as model policies to replicate. Additionally, regions with existing greenhouse gas markets can link with emerging markets or broaden to cover new sectors. For instance, RGGI only covers emissions from electric utilities, but some policy makers are looking at opportunities to expand the protocol to include transportation or establish a cap on transportation emissions under another program.



CASE STUDY



Demonstrating how quickly a state can move forward ambitious executive action, former **Virginia** Governor Terry McAuliffe deployed available air pollution control tools and issued an Executive Directive in May, 2017 requesting the development of a “trading-ready” regulation to limit carbon pollution from the power sector. After broad stakeholder outreach, a draft regulation was formally proposed to the state’s Air Pollution Control Board in the fall of 2017. Current Governor Northam continued this climate leadership, shepherding the regulatory process ahead through his first year in office. A final regulation is expected to be compatible with the successful RGGI program, and completed in time to facilitate compliance beginning in 2020.

“Now more than ever, it’s essential that **states step up to the plate** to do what they can to control GHG emissions.”



Michael G. Dowd,
*Director, Air & Renewable Energy Division,
Virginia Dept. of Environmental Quality*

CONCLUSION

The 10 opportunities laid out above can be seized immediately by nonfederal actors using existing authorities with enormous economic or public health benefits, and do not depend on federal legislation or regulatory authority. While not every business, city, and state in the country will take every action on this list, the impact of the full range of potential emissions reductions listed above is far greater than the gap between business-as-usual trends and the target set by the United States under its Paris Agreement Nationally Determined Contribution: **reducing emissions by at least 26% below 2005 levels by the year 2025.**

In September, the America's Pledge initiative will release the results of an economy-wide integrated assessment model that analyzes the emissions reduction potential of increased ambition across these 10 opportunity areas. However, U.S. climate leaders need not wait for the results of this—or any other—analysis to get started. Indeed, each of the 10 opportunities included here presents immediate economic, health, innovation, and environmental benefits that produce win-win outcomes for local communities and businesses and for the national economy. America's low-carbon future is fast approaching, and the commonsense actions of America's true climate leaders—its businesses, cities, and states—are helping to ensure that future arrives as quickly as possible.