



Public-private collaborations for cleaner communities

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How state and local governments, energy companies, and major employers can work together to make their buildings, transportation, and energy systems cleaner and more resilient.

As public awareness of the risks of climate change has grown, along with the development of economically attractive clean energy solutions, state and local governments, energy companies, and major employers across the country have made a spectrum of commitments to meet the challenges posed by climate change. These organizations have set a range of voluntary and mandatory targets for reducing greenhouse gas (GHG) emissions, principally by increasing clean energy resource deployment. Their perspectives, priorities, and concerns vary, but areas of common interest are emerging that support the need for collaborative efforts to reduce GHG emissions, accelerate clean energy action, and build stronger and more resilient economies.

Decarbonization is a complex process in the best of circumstances. But now, as the United States experiences an economic recession caused by the COVID-19 pandemic, organizations face additional economic and operational challenges. Despite these challenges, public and private entities—state and local agencies, governors' and mayors' staff, utilities and their regulators, major employers and energy users, environmental organizations, and other stakeholders—have the opportunity in this moment to forge new partnerships for cleaner and stronger communities.

Why prioritize collaboration now? While it may seem counterintuitive, the suspension of normal routines gives all parties more time to ponder their goals, assumptions, and strategies.

What's more, the disruptiveness of the pandemic has opened the door to rethinking old paradigms—allowing public and private stakeholders to rally around a shared goal of creating cleaner communities in the wake of COVID-19.

Laying a foundation for successful collaboration starts by understanding the challenges that each stakeholder faces along the path to decarbonization.

Start by understanding the different stakeholder challenges

State and local governments, energy companies, and major employers share some of the same drivers for decarbonization, including: state and local energy and climate policies, voluntary commitments to emissions reporting or reduction; citizen, shareholder, and employee pressure; reducing business and operational risk; economic development; and managing system disruptions and costs of extreme weather. But while they share similar drivers, the challenges they face can differ significantly.

In the public sector, many U.S. cities are setting targets and charting plans and programs. While some lack the information, tools, and resources to meet their needs, almost all face staff and financial resource constraints. Some of the states that have set targets and established plans need help mobilizing action and resources at the pace required to meet their goals.

In the private sector, U.S. utilities are also setting ambitious emission reduction targets: over 20 large companies serving 67% of customers have set goals of approaching carbon neutrality by 2050.¹ However, pursuing those goals across state and city boundaries with differing policies complicates strategic planning, regulatory compliance, and coordination. Other businesses face their own mix of pressures from consumers, investors, and employees. Sixty-eight percent of North Americans expect companies to implement programs to improve the environment²; more than half of the 400 companies that ICF researched through ENERGY STAR have set carbon and/or renewable goals. Companies are wrestling with outward-facing business risks such as losing customers and investors, as well as internal risks on the operational side, if they do not show sufficient attention to climate change.

Move from challenges to areas of shared interest and opportunity

While the landscape of decarbonization challenges varies from entity to entity, all parties share key areas of interest. By focusing on three areas—target setting and planning, low-carbon energy supply, and electrification—and establishing a common vocabulary, stakeholders can find opportunities to work together to meet their commitments and create cleaner communities.

Exhibit 1 (below) illustrates the variety and complexity of stakeholder interests and capacity for action. For example, utilities, residents, and elected officials share an interest in reducing home energy costs. Regulators, however, must rule on the alignment of these interests in ratepayer-funded demand-side management programs.



Resilience also ranks high across all stakeholder types. But defining resilience in concrete terms—and aligning stakeholder actions—takes active collaboration. An electricity regulator might define resiliency in terms of the number, extent, and duration of grid outages. Meanwhile, a mayor might define it as microgrids that sustain public health and safety facilities during grid outages, and a diverse local economy that is sustainable in changing climate conditions. It takes active collaboration among public and private stakeholders to build a common foundation of understanding and realistic roadmaps for action.

EXHIBIT 1. MAPPING THE RANGE OF STAKEHOLDER INTERESTS AND ABILITY TO ACT

	State	Local	Electric Utilities	Utility Regulators	Businesses
Target Setting & Planning					
Energy	🔴	🔴	🔴	🟢	🟢
Transportation	🟡	🟢	🟢	🔴	🟡
Buildings	🔴	🔴	🔴	🟢	🟢
Other Sectors	🟡	🟢	🔴	🔴	🟢
Resiliency/Co-Benefits	🟡	🟢	🟢	🟡	🟡
Low Carbon Energy Supply					
Carbon Free Grid	🟢	🔴	🟡	🟢	🔴
Biogas/RNG/Hydrogen	🟡	🔴	🔴	🟡	🔴
Energy Storage	🟢	🔴	🟡	🟢	🟡
Distributed Resources	🔴	🟡	🟡	🟢	🟡
Electrification					
Commercial Buildings	🟡	🟡	🔴	🟢	🟢
Residential Buildings	🟡	🟢	🔴	🟢	🟢
Transportation	🟡	🟡	🔴	🟢	🟢
Non-Road	🔴	🔴	🔴	🟢	🟢
Industry	🔴	🟡	🔴	🟢	🟢

Stakeholder has:

- No interest
- ◐ Moderate interest
- Very strong interest
- Limited ability to act
- Moderate ability to act
- High ability to act

Target setting and planning

These framework commitments drive more specific strategies to reduce GHG emissions through energy supply and demand technologies. Target setting and planning typically takes the form of government climate action, including plans, legislated policies, executive orders, and corporate GHG reduction commitments.

¹<https://sepapower.org/utility-transformation-challenge/utility-carbon-reduction-tracker/#:~:text=Utilities%20have%20goals%20of%20carbon,by%202050%20are%20SEPA%20members.>

²<https://www.nielsen.com/us/en/insights/report/2018/unpacking-the-sustainability-landscape/>



ICF has supported clean energy and transportation planning across the U.S

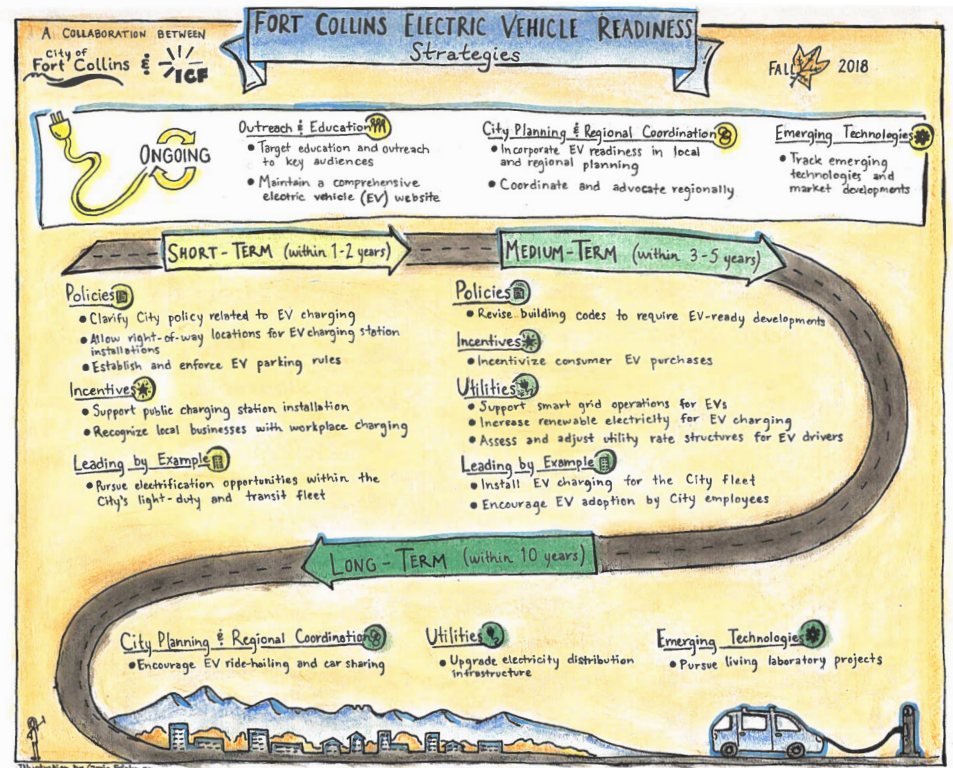
To develop its Electric Vehicle Readiness Roadmap, the City of Fort Collins enlisted ICF's help to convene a diverse group of stakeholders representing the public, local business, power providers, academia, and other government partners. This steering committee provided the guidance, oversight, and perspective needed to shape a plan that supported current and future EV adoption in the area. The resulting plan outlines more than 20 strategies and associated actions necessary to move the needle on transportation electrification. While City departments are responsible for leading each strategy's implementation, nearly all strategies rely on the partnership of at least one external organization.

While there is wide public support for clean energy and emission reduction, it's important to turn this support into concrete energy and emissions targets so that governments and energy companies can work toward specific goals. This allows for rational, cost-effective actions that transform our energy systems without creating disruptions or excessive costs.

Growing numbers of states and cities are making ambitious climate commitments. Working with umbrella efforts like America's Pledge, the U.S. Climate Alliance, and the Global Covenant of Mayors, more than three-quarters of the nation's 51 largest cities have set GHG emission reduction targets. Many of these commitments, however, have not yet been followed by the concrete data, detailed analyses, and financial and staff resources needed to implement measurable actions. More than half of U.S. states have developed climate action plans or have set legislative clean energy standards for renewable energy and/or energy efficiency. The legislation, regulations, and investment needed to realize the aspirational goals presents a longer-term, more complex set of challenges.

In the private sector, utilities representing two-thirds of U.S. customers have set GHG emission reduction targets, many of them committing to net-zero emission goals over the next 20-30 years. Some 4,000 companies reporting to the CDP (formerly known as the Carbon Disclosure Project) have set GHG emission reduction targets.

Collaborations in the target setting and planning space can take many forms: stakeholder engagement of energy utilities and major employers through state and local climate action plans, co-funding of deep decarbonization studies, and roadmapping processes in which government and private sector entities play equal stakeholder roles.



ICF has helped U.S. communities source clean energy supplies

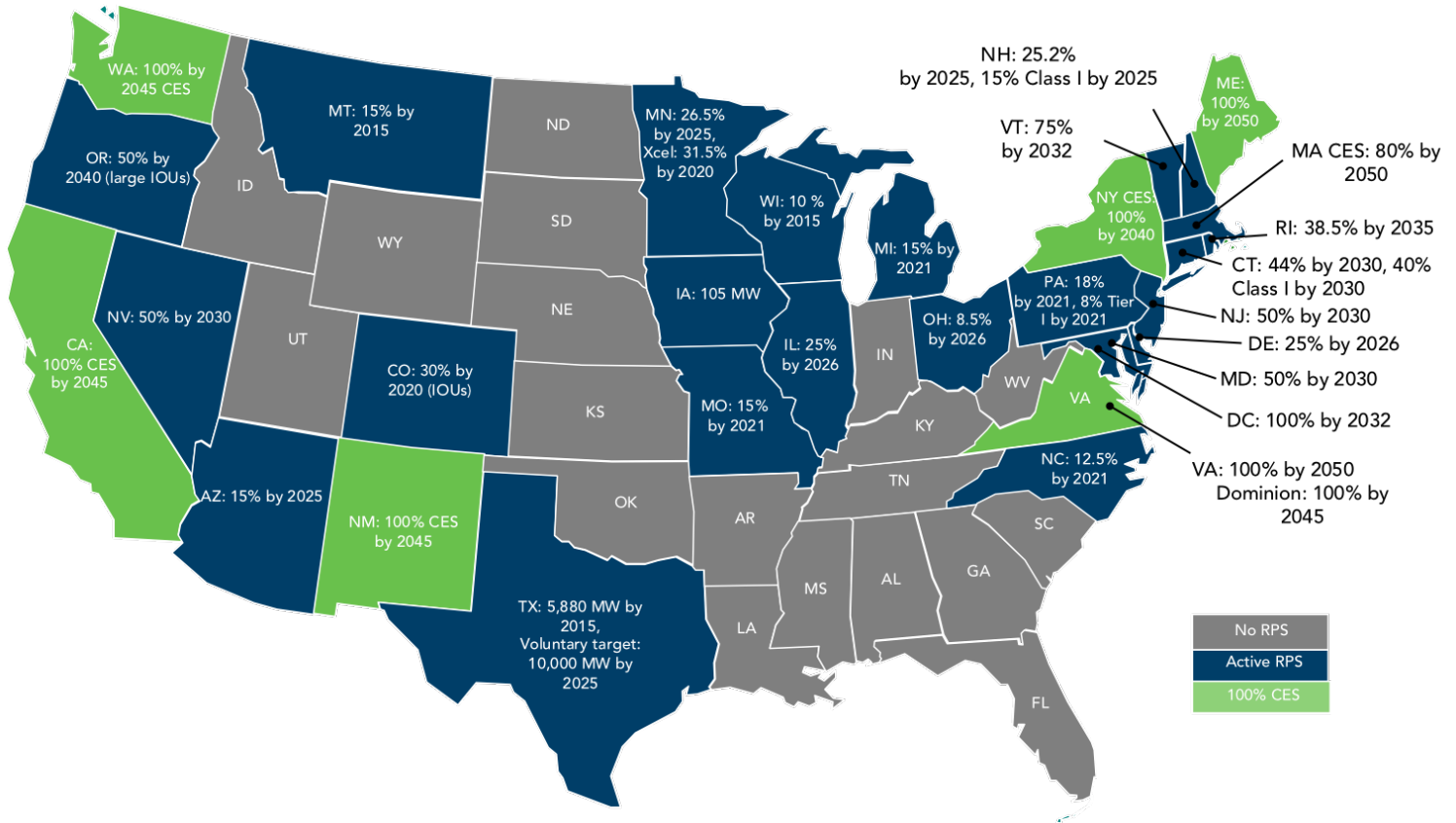
- Arlington County/Amazon/Dominion Solar power purchase agreement
- Denver/Xcel CO memorandum and power purchase agreement
- U.S. Department of Energy Combined Heat and Power database of wastewater methane sites.

Low-carbon energy supply

Low-carbon energy supply strategies reduce electric grid carbon intensity, develop low-carbon gaseous and liquid fuels, and apply distributed energy resources such as small-scale renewables and battery storage. Driving pollutant emissions out of our energy systems is job one for cleaning up our energy economy and reducing GHG emissions.

Done right, we can enjoy cleaner air, better health, and lower climate risks while sustaining and expanding our prosperity. Toward this end, the majority of states have set clean energy standards (see Exhibit 2), and many cities have made GHG reduction and clean energy commitments. But in some cases, finding the needed levels of low-emission resources is a problem as not all regions or localities have the same levels of clean energy supplies, creating implementation challenges for energy suppliers. Another challenge is siting renewable energy facilities at scale in dense urban environments, or where coastal wind conditions limit siting opportunities and space for storage is limited.

EXHIBIT 2. STATE CLEAN ENERGY STANDARDS



Most clean energy standards to date have focused on the power sector: more than thirty states have such policies, while only seven states have set standards on liquid or gaseous fuels.



Low-carbon liquid fuels tend to come in the form of ethanol or biodiesel from corn and other crop sources. Low-carbon gas supplies can be found at metropolitan wastewater and landfill facilities as well as in rural agricultural areas in crop and manure processing. Supplies of these fuels, especially on the gas side, face limits in total supply capacity, and in some cases are not located close to urban markets.

State and local governments and large companies are also driving voluntary markets for low-carbon energy supply. With prices for solar and wind electricity now competitive with other options, there is a rapidly growing trend for renewable energy power purchase agreements. These enable governments and businesses to make their electricity supplies carbon neutral through public-private partnerships.

Conducting resource assessments, planning, and roadmapping processes can help identify the most cost-effective and implementable options for a given geography. These efforts can forge productive partnerships between governments, major employers, and energy companies.

ICF helps cities and utilities develop and deliver electrification solutions

- New York City/Con Edison/National Grid deep decarbonization pathways study
- Beneficial electrification assessments for public (TVA, JEA, OUC, SMUD) and investor owned utilities (Southern, Duke, FPL, Centerpoint, Alliant)
- Emerging Electric Technologies for Industrial Heating Reference Guide (EPRI)
- CO2 Reduction through Electrification of Airports, Ports, and Truck Stops (PSEG)

These projects span national, state, and local geographies and engage government, energy companies, and energy users.








Electrification

A major player in the drive for clean and efficient energy demand, electrification strategies focus on converting high-carbon fuel end-uses to electricity—including building end-uses such as space and water heating, industrial end-uses such as materials handling, and personal and fleet vehicles.

Because it's now technically and economically feasible to clean up the electric grid, a consensus is growing to switch most of our energy uses to electricity, which reduces emissions while sustaining prosperity. A wide range of strategies can be used to convert fossil fuel combustion to electric technologies. There are a number of options to deploy these strategies across the buildings, transportation, and industrial sectors (see Exhibit 3). Electric vehicles are gaining wider use for both personal and fleet use while building electrification is gaining broader acceptance as a decarbonization strategy in some jurisdictions. Local government/electric utility partnerships are burgeoning, especially in deploying vehicle charging infrastructure. For example, Maryland investor-owned utilities have been approved by the Public Service Commission (PSC) to install charging stations for public use, but they must partner with local and state government entities. The electrification of non-road vehicles, materials handling, and industrial applications are also gaining traction.



EXHIBIT 3. ELECTRIFICATION STRATEGY OPTIONS

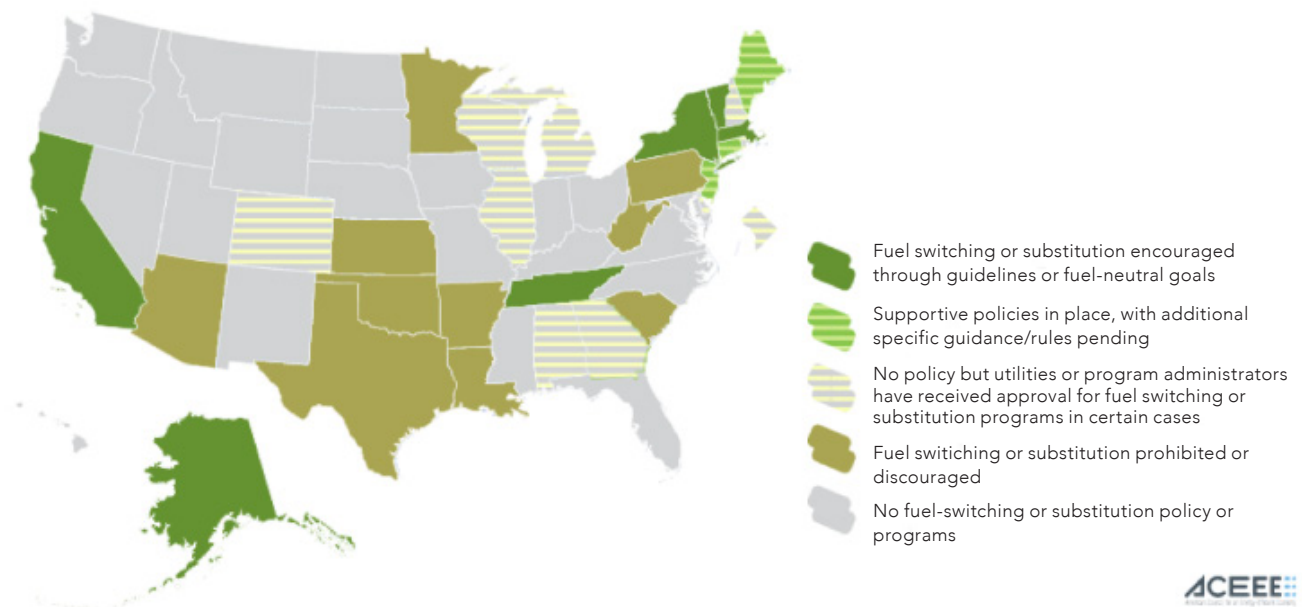
Technologies		Locations		Strategies	
 Non-Road & Material Handling	 Manufacturing	 In-route	 Infrastructure Deployment		
 On-Road, Light-Duty	 Infrastructure (Ports/Airports)	 Workplace or Destination	 Incentives & Financing		
 On-Road, MD & HD	 HVAC	 Multi-family	 Education & Outreach		
 On-Road, Buses	 Water Heating	 Fleets	 Rate Design		
 Food Preparation	 Recreational	 Home	 Partnership Planning		
 Custom	 Trains		 Managed Charging		
			 Active Load Management (DR, V2G)		

Yet stakeholder interests and capabilities do not always align to support electrification strategies. Especially in cases where electrification poses technical and business challenges for fuel providers, it can face technical, regulatory, market, and political challenges.

Emerging trends that create uncertainty and potential opposition to electrification strategies include:

- Some local/state governments are moving to ban or restrict new fuel uses while in others, fuel switching is restricted, often due to industry opposition.
- Some building stock is more challenging to electrify, such as older stock with hydronic heating and no central AC/air ducts. This increases the technical challenges and adds to the cost of electrification, which could discourage markets from deploying electric heating systems.
- The HVAC industry is facing uncertainty on future refrigerants permissible under the Montreal Protocol, making it harder to project future electric heating system performance or costs.
- The utility role in transportation electrification is changing quite rapidly, and the role is being shaped in large part by the regulatory landscape—particularly utility commissions. Utilities need to take action to proactively confront impending policy issues and drive the rise of electric vehicles to their advantage.
- Some states permit or promote fuel switching, while others do not (see Exhibit 4).

EXHIBIT 4. STATE POLICIES ON FUEL SWITCHING



Public-private collaboration in action

While responses to and actions for decarbonization vary across key players, the best chance for success involves players working together to move to implementation. Below are two public-private partnerships that led to successful decarbonization efforts.

Utility/County/Company-Amazon—in partnership with Arlington County, Virginia, which hosts its new headquarters—worked together with Dominion Energy³ to supply their electricity needs with renewable energy. Amazon and the county negotiated a 120-MW solar power purchase agreement (PPA) with Dominion. This agreement helps all three parties meet their energy and emissions goals while reducing energy costs. It supports the County's recent update of its Community Energy Plan to reduce GHG emissions and was completed just before the state legislature passed the Virginia Clean Economy Act, which commits the Commonwealth to a carbon-free electricity system by 2050. Since it also came before Dominion announced its own carbon neutrality goal, this PPA is emblematic of the kind of synergies available in today's energy markets.

Utilities/City-New York City, Con Edison, and National Grid have partnered on a joint study⁴ to assess what it will take to reduce the city's emissions at least 80 percent below 2005 levels by 2050 (80x50). This in-depth pathway modeling analysis is designed to better understand the technologies, markets, and associated costs for buildings, transportation, industry, and energy supply energy infrastructure.

³<https://www.bizjournals.com/washington/news/2020/01/28/amazon-arlington-hope-solar-farm-can-power-most-of.html>

⁴<https://www.3blmedia.com/News/New-York-City-Con-Edison-and-National-Grid-Launch-Study-Building-Toward-Carbon-Emission>

The study is diving deep on technology and cost issues, while facilitating information sharing among stakeholders. This collaboration will help the utilities and the City understand their mutual interests and individual challenges, and to seek areas of agreement on priorities for policy and program action.

The spectrum of collaboration options for building cleaner and more resilient communities through low-carbon energy strategies is expanding rapidly. The table below lists exemplary efforts, most of which ICF has worked on; these examples offer best-practice learnings for the methods and processes that can lead to productive, actionable outcomes.

Collaborations: Lead Actor/Action	Examples
<p>Cities/utilities Deep decarbonization modeling studies</p>	<ul style="list-style-type: none"> ▪ New York City, Con Edison, National Grid 2020 project ▪ Metropolitan Washington Council of Governments 80x50 study
<p>Cities/utilities Sectoral roadmapping projects</p>	<ul style="list-style-type: none"> ▪ Fort Collins EV Readiness Roadmap ▪ Denver 100% Renewable Energy Roadmap
<p>Utilities Beneficial electrification assessments</p>	<ul style="list-style-type: none"> ▪ TVA, JEA, OUC, SMUD, Southern, Duke, FPL, Centerpoint, Alliant
<p>Local governments/utilities/independent power producers Power purchase partnerships</p>	<ul style="list-style-type: none"> ▪ City of Denver/Xcel Energy 100% renewable power agreement ▪ City of Philadelphia solar PPA ▪ County of Arlington/Amazon/Dominion solar PPA
<p>Governments/Fleet Owners/Utilities Electric vehicle charging infrastructure partnerships</p>	<ul style="list-style-type: none"> ▪ San Diego Gas & Electric/Port of San Diego—electric vehicles and forklifts ▪ Dominion Energy/Virginia school districts—electric school buses ▪ Austin Energy/school district—EV chargers plus EV education for students ▪ Duke Energy/Asheville, Greensboro, and other local governments—electric bus charging stations
<p>Governments/utilities/developers Infrastructure assessments</p>	<ul style="list-style-type: none"> ▪ Utility-led fleet electrification assessments (e.g., National Grid) ▪ City-led power sector infrastructure assessments (e.g., NYC Pathways study)

<p>Utilities/local governments Customer program offerings</p>	<ul style="list-style-type: none"> ■ Buildings electrification incentives (e.g., Con Edison heat pump incentives, SMUD low-income electrification) ■ Technical assistance to building owners (e.g., New York City Retrofit Accelerator) ■ Off-road beneficial electrification (e.g., Energy and JEA incentives) ■ National standardization of incentive programs (e.g. Esource, ICF initiative)
<p>Federal/state/local governments and utilities COVID-19 recovery strategies</p>	<ul style="list-style-type: none"> ■ Accelerated upgrades of vacant buildings (e.g. LA school district) ■ Leveraging analytics to assess EE and electrification potential (e.g. NYC Pathways study)

Recommended first steps

Decarbonization is one of the defining efforts of our time. While an important first step involves setting targets and making commitments, public and private entities often struggle to make sufficient progress on their own. ICF is ready to help public and private clients collaborate in new and productive ways as the clean energy policy arena and marketplace continue to grow. For those ready to move forward, the following basic steps can help get the ball rolling:

- Convene a stakeholder workshop involving public agencies, energy companies, and business and citizen organizations to gauge interest and commitment to a consensus process. Use this workshop to seek agreement on roadmapping and/or study efforts needed to build consensus on specific actions.
- Based on workshop outcomes, conduct detailed roadmapping/study processes, including stakeholder engagement processes. Use these processes to select the top priorities with the greatest consensus.
- Develop consensus agreements that spell out stakeholder consensus on specific policy and program actions for government and private entities. Consensus agreements should include specific action plans that commit participants to act on or support specific items.
- Advance action plans via joint outreach and advocacy with local, state, and federal authorities as well as private sector stakeholders.



About the Authors



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Bill Prindle has over 40 years of energy and environmental experience. He provides technical and business strategy leadership for ICF's clean energy and climate services. He has directed or provided senior technical advisory support for projects in Bangladesh, China, El Salvador, Ghana, India, Kazakhstan, Mexico, Mozambique, South Africa, Tajikistan, and Tanzania. From 2011 to 2017 he served as Senior Advisor for USAID's Energy Efficiency for Clean Development Program (EECDP) global cooperative agreement. In this role he led ICF's technical work for Associate Award projects to conduct Integrated Resource and Resilience Planning (IRRP) in Tanzania and Ghana, as well as integration of best practices into new program development. His subject matter expertise includes policy analysis, energy analytics, program design, and field implementation, gained through projects on resource assessment, public policy development, utility-sector efficiency programs, building codes, and appliance standards. He has testified before legislative and regulatory bodies, served on numerous nonprofit organization boards, and made several major media appearances as an energy and climate expert. He holds a master's degree in energy management and policy from



Deborah Harris, Director, Climate and Sustainability

Deb Harris is an expert in climate action and decarbonization planning, particularly for states, cities, counties, and utilities. She has worked on numerous subnational climate action plans and energy plans, greenhouse gas inventories, and decarbonization scenarios analyses. She also has long-standing experience with carbon capture, utilization, and sequestration; collecting, understanding, and analyzing sustainability data and metrics; fluorinated greenhouse gases; greenhouse gas monitoring, reporting, and verification; and national inventories and action plans.

Deb has worked with a broad range of domestic and international clients, such as the Commonwealth of Pennsylvania, the state of Delaware, New York City, the City of Philadelphia, Arlington County, Fairfax County, the City of Los Angeles, various utilities, the U.S. Environmental Protection Agency (EPA), the U.S. Department of Homeland Security (DHS), the U.S. Agency for International Development (USAID), the United Kingdom's Department of Energy and Climate Change (DECC), the Global Carbon Capture and Storage Institute (GCCSI), the Western Climate Initiative (WCI), and the World Bank Partnership for Market Readiness (PMR), among others.

She has a Master of Science in Engineering in Environmental Engineering from Johns Hopkins University and two Bachelor of Science degrees in Chemical Engineering and Engineering and Public Policy from Carnegie Mellon University.





Stacy Noblet, Senior Director, Transportation

Stacy Noblet has extensive experience in the energy, climate, and transportation markets. She is an electric vehicle and charging infrastructure subject matter expert, working with public and private clients to plan for and meet goals related to transportation electrification. She also manages numerous projects that focus on increasing the use of clean fuels and technologies in the transportation sector. Stacy provides clean transportation support to utility companies, state agencies, and local governments across the country. She also works with the National Renewable Energy Laboratory, U.S. Department of Energy, National Park Service, and U.S. Environmental Protection Agency.



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