



→ **How to successfully run large-scale electrification programs**

By Matt Dugan, Laura Orfanedes, and Chris Watson, ICF

Introduction

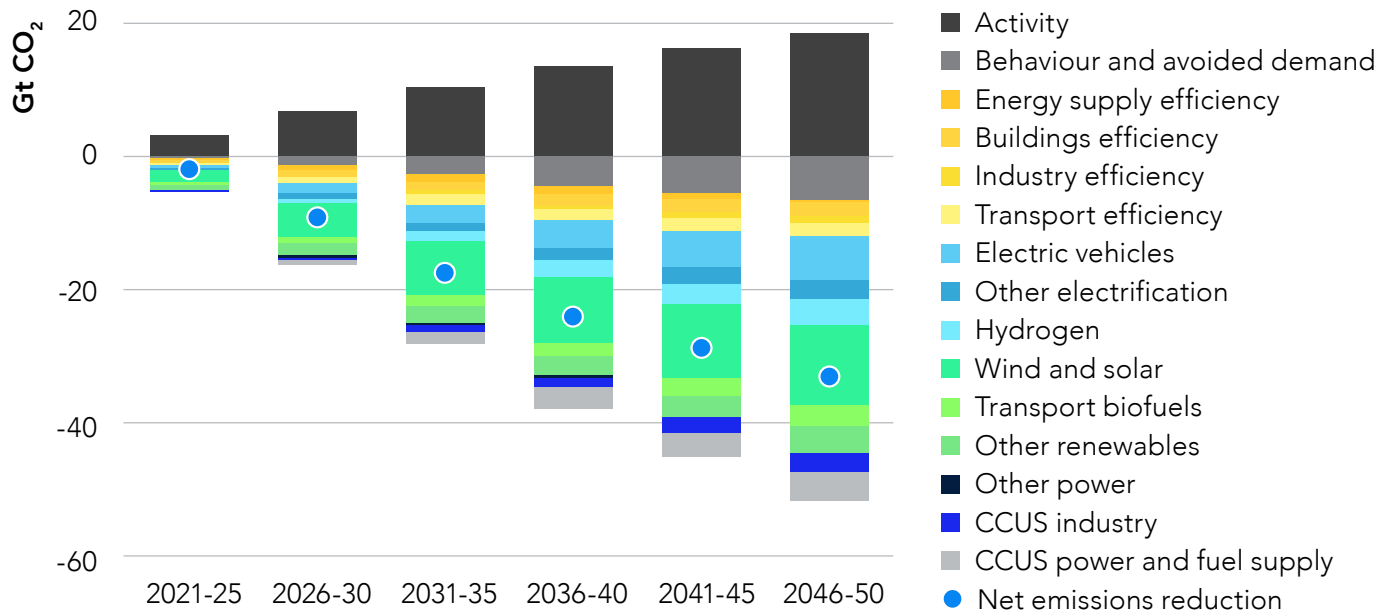
As a part of efforts to reach ambitious decarbonization goals and prepare the electric grid for disruptive change, states from coast to coast are looking to electrification as part of their energy strategy.

The reason is clear. The International Energy Agency in its Net Zero by 2050 report estimates that, after renewable energy, electrification will make the largest contribution to emissions reductions.



Average annual CO₂ reductions from 2020 in the Net-zero Emissions Scenario

Renewables and electrification make the largest contribution to emissions reductions, but a wide range of measures and technologies are needed to achieve net-zero emissions.



Source: IEA Net Zero by 2050 report, chart on Page 56. <https://www.iea.org/reports/net-zero-by-2050>

Notes: Activity = changes in energy service demand from economic and population growth.
Behaviour = change in energy service demand from user decisions, e.g., changing heart temperatures.
Avoided demand = change in energy service demand from technology developments, e.g., digitalization.

Large-scale electrification programs intended to advance statewide or utility-wide goals can be quite complex, time-consuming, and resource-intensive. Success can require coordinating communication and implementation across utilities, vast builder and contractor networks, and the customers of multiple utilities. Whether a utility or state has already approved a large-scale electrification program or is simply considering one for the first time, stakeholders need to develop a holistic, integrated approach to meet the challenges ahead and reach critical goals.

Based on ICF's experience as the largest implementer of electrification programs in North America, this paper shares four hurdles that must be overcome to create the conditions for program success. It also outlines an approach utilities can take to achieve the necessary integration across functions serving electrification programs. Finally, the paper provides a case study on the [New York State \(NYS\) Clean Heat program](#), a statewide electrification program involving multiple utilities across service territories.



4 large-scale electrification program hurdles—and planning recommendations to overcome them

As a first step to success, it's critical that utility leaders acknowledge that large-scale electrification programs are not your mother's and father's energy efficiency programs. Electrification programs often require integration and collaboration among utilities, whereas efficiency programs of the past could succeed within individual utility silos. Some of the variables determining success live outside a traditional program team's purview, meaning collaboration across utility functions is needed.

There are four common hurdles utilities must clear to create the conditions for large-scale electrification program implementation success:

- 1. Rebates and rules**
- 2. Insufficient contractor workforce**
- 3. Customer costs and impacts**
- 4. Grid infrastructure**

Addressing those hurdles in the program planning and design phases is critical to create the conditions for success.

Invest in getting rebates and rules right from the start

At the program design phase, it's critical to set rebates at an appropriate level to move the market so that utility customers—and the contractors required to install electrification infrastructure—want to participate. Program designs also need to include rules that make sure rebates and incentives are used as intended. One example could be requiring legacy heating systems to be decommissioned so that customers who receive rebates for installing electrified heat won't just continue to use their old, high-emitting heaters.

Rebates and rules should be specific to the target sector. For example, a single-family residential homeowner has a very different decision-making process and interests than a large commercial building owner or a rental company that manages multifamily high rises. It's also important to find a balance in which rebates and rules are appropriate but not too complicated. The more complex, the more they will dampen program participation. It's also more likely those who do try to take advantage will be rejected due to misunderstanding the rules.

Finding the appropriate rebate levels and setting the right rules requires research, surveys, data, and analysis.

Heating electrification incentives

For organizations planning for or designing heating electrification programs, ICF recommends "dollar-per-dwelling-unit incentives" for two reasons:



- 1. They are easy for contractors to market and communicate to customers.**



- 2. As a function of their design, they help ensure projects are sized properly to buildings.**

Chart a path to contractor sufficiency

Oftentimes, when a big electrification goal is set at the state or even corporate level, there has been little to no consideration of whether the relevant service territories have the number of contractors available to reach those goals. In much of the country, HVAC installers and other qualified tradespeople are in short supply.

As such, utilities need to research the existing contractor network and identify needs. Program leaders must think about how they will ensure there are sufficient contractors who are well trained to deliver the work the electrification program envisions.

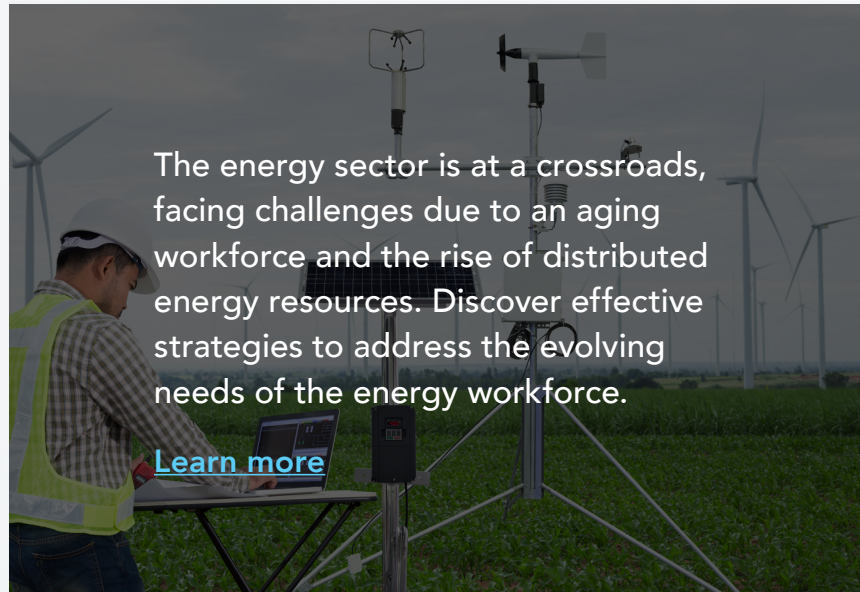
Protect customers from after-the-fact costs and impacts

It's tempting to view the installation of a new electrified heating system or EV charger as a program success. But that's not the end of the story for consumers. If customers in cold climates see their overall heating costs skyrocket when they switch from oil or propane heat to electric heat, there will be blowback for utilities.

Program leaders should consider offering customers options to mitigate cost increases, such as weatherization offerings or special rate programs available to those who switch to qualifying heating systems. The story for transportation electrification is similar; customers need help to ensure EV charging doesn't trigger onerous costs, such as peak demand charges.

Align electrification plans with grid infrastructure

Utilities know that building and transportation electrification will drive new demand peaks and stress local distribution grids. However, customers will be unconcerned with their utility's challenges if they are unable to charge their car to get to work or heat their homes on a freezing winter day. This means management of load growth becomes even more critical than it already is, and electrification programs are one means to accomplish load management goals.



The energy sector is at a crossroads, facing challenges due to an aging workforce and the rise of distributed energy resources. Discover effective strategies to address the evolving needs of the energy workforce.

[Learn more](#)

It will be critical for program teams to collaborate across utility departments with system planning organizations to solve key questions about when and where new electric demand can be met reliably. Utility leaders should prioritize more coordination to identify current and likely strained areas on the distribution grid, then charge teams including program teams with finding ways to relieve pressure points collaboratively.

Though program leaders might feel that grid planning and investment is out of their hands, they can consider promoting weatherization prior to electrification, which may reduce the new load from electric heating systems while promoting more comfortable spaces. ICF has helped Con Edison initiate just such a weatherization program in New York.

Keys to program implementation: integration, education, innovation

The four hurdles to large-scale electrification program success must be addressed in wide-ranging areas from program design to grid planning. By first mitigating the four hurdles through careful planning and design, utilities can then pursue program implementation success. Three themes that underly successful approaches to program implementation are integration, education, and innovation.

Integration

Large-scale electrification programs are inherently complex. Program stakeholders are both large in number and diverse. It takes many utility functions to implement an electrification program across stakeholder groups, including:

- Customer care and call centers
- Marketing and communications
- IT
- Field-based account management
- Workforce development and contractor training
- Quality assurance and control
- Research

Successfully implementing big programs supported by many functions requires high-level integration across all work. Take the example of a program with a goal of incentivizing the installation of electrified heat systems. Research teams need to help customer care understand customer awareness about the new technologies on offer. Customer care must be trained to discuss the installation and use of these technologies with customers, who often know very little about them. Marketing and communications must amplify key messages from customer care at scale.

Focusing specifically on the task of new contractor recruitment within the NYS Clean Heat program, ICF helps Consolidated Edison of New York integrate efforts across communication and marketing channels and in the field. ICF's recruitment initiative then integrates with a quality control/quality management function to ensure new contractors meet the requirements for training, certification and insurance as specified by the statewide Clean Heat program and Con Edison. When those contractors become qualified to receive Clean Heat incentives, ICF adds them to a statewide Clean Heat "find-a-contractor" portal, which it links to Con Edison's heat pump web sites. The integrated process is designed to make sure new contractors are onboarded with the right qualifications and potential customers can find them as soon as they are eligible.

Education and stakeholder engagement

Electrification programs are not traditional demand-side management programs in which the technologies are familiar and the workforce has been installing something like insulation for decades. As such, education and engagement tailored for each stakeholder group should be a program-wide focus during implementation.

Functions such as customer care, call centers, and marketing and communication can take the lead on customer education.

Customers need education to understand the benefits of transitioning to electrified technology, how to qualify for program incentives, how to appropriately use and maintain the new technology after it's installed, and even how to interpret their return on investment.

It's not uncommon for confused customers to reach out to complain that their electric bill doubled, but they're not accounting for the large oil heating bill they are no longer paying. When utilities help customers understand the full ROI, they often feel more satisfied. For the NYS Clean Heat program, ICF developed customer-facing educational materials that provide operating tips and tricks, debunk common myths surrounding electrification technologies, offer common maintenance requirements, and answer frequently asked questions.

Electrification programs are inherently contractor dependent. If contractors don't know how to install and properly size and design new types of heating systems or EV charging infrastructure, programs will fail to reach their goals. Therefore, contractor education is a key component of workforce development, contractor outreach and recruitment, and quality control. Contractors are willing to learn new tricks when doing so unlocks new economic opportunities and there are learning resources available.



Innovation

Because large-scale electrification programs are a relatively new breed, they're still in the early stages of evolution. That means mechanisms for innovation should be built into the process. Teams need to evaluate program data and other feedback regularly to unearth important questions. Behind those questions are answers that will lead to valuable innovations. In the short history of large-scale electrification programs, this mindset has led to many innovations, including:

- **Instant discounts and low-interest financing:** Available cash to pay the full cost of installing electrified equipment is often a pain point for customers, so program designs have shifted to offer solutions. Instant discounts allow contractors to provide customers the value of a program's incentives up front. However, this shifted the cash pain point to contractors, leading to further innovations to preapprove payments to contractors. The NYS Clean Heat program has design mechanisms to solve both the customer and contractor pain points, and the result is reduced barriers for customers and contractors to participate in the program. With low-interest financing, the Mass Save program offers a 0% interest HEAT loan for residential customers, which has been a popular offer.
- **Customer consultations and targeting:** Customers often need significant help to get to a buying decision on a purchase of something like a new heating system. Websites and emails are important, but not sufficient. One innovative response to this challenge has been the launch of in-person and virtual customer consultations to give customers hands-on help through the process. Additionally, [analytics are utilized to target specific customer groups](#) based on factors such as income level and housing type, ensuring the delivery of relevant information at the right time in their customer journey..
- **Risk-mitigating rate plans:** In the early days of building and transportation electrification programs, customers were left on their own to fend with the cost implications of adopting a new technology. Utilities have learned that's not a sustainable approach to grow electrification. Today, many are experimenting with rate innovations, such as allowing customers who install an electrified heating system to participate in a special rate plan that caps any electricity cost increase they might incur from using their new system.
- **Inclusivity:** Customers have different incomes, education levels, home types, and even first languages. Ensuring a program is inclusive for all types of utility customers means taking actions such as providing program materials translated in various languages. It is common for utilities to serve territories in which many customers and contractors do not speak English as their primary language. Income level also has a deep impact on how customers consider information and make decisions, so getting low-income customers the messaging and resources that address their concerns is another opportunity to build a more inclusive program. Special offers for low- and moderate-income customers are another means to support income-based inclusivity.

Case in point: New York State Clean Heat

When New York announced its NYS Clean Heat program, it asked utilities across the state to work together to offer their customers rebates and other incentives to transition from fossil fuel-based home heating to qualifying electric heating systems.

New York's utilities needed to find a way to coordinate with a large network of contractors who worked across utility service territory lines and whose success in selling their services to each utility's customers would be critical for the program's success. ICF was chosen to help bring order to implementation and communication of the Clean Heat program for all utilities. With ICF's support, some of the program's most notable successes include:

Single implementation contractor approach

The Clean Heat Program was designed to encourage HVAC contractors to promote electrification through heat pump installation for space and domestic water heating by providing the same nine incentive categories across six New York utility service territories. Though ICF initially supported only three of the six utilities when the program launched, by the second quarter of 2021, it was the implementation partner for the residential sector for all six utilities, allowing ICF to provide unified application intake and processing, contractor enrollment, collateral creation and distribution, and reporting.

With processing under a single implementation contractor, program participation ramped up significantly through the end of 2022. As of 2023, the program has achieved more than 90% of its six-year (2020-2025) MMBtu savings target.

Centralized and unified program tools

ICF converted separate utility online intake tools for application submission into one tool, with the same IT team supporting the tool for all six utilities. This significantly improved the contractor experience.

To support contractor enrollment, ICF developed a single contractor management portal for contractors to submit enrollment data and upload appropriate certifications, participation agreements, and insurance documents. Contractors using the portal can enroll once to participate in all six utility territories.

On the customer side, ICF implemented a program-wide customer care call center with a single phone number and email address for customers of all utilities, providing a single contact point for customer questions and inquiries.

The ICF marketing team provides support across all six utilities, creating consistent formatting and messaging for contractor newsletters, contractor sell sheets, and customer buying guides. While each utility has specific approaches, the single marketing team can nimbly adjust to those requirements while providing consistent program-wide messaging.

Feedback mechanisms

ICF participates in program oversight meetings each week to provide implementation perspective, cross-utility performance data, and share in new measure research. This feedback mechanism helps the program expand the range of electric heating systems that qualify for the program. Through 2023, the program offered incentives for cold climate air-source heat pumps, ground-source heat pumps, and heat pump water heaters. By providing feedback and collaborating with the Clean Heat program's joint management committee, ICF helped develop and launch a new incentive for air-to-water heat pumps, scheduled to go live in 2024, which will provide an attractive alternative for customers with existing hydronic systems.

Conclusion

Large-scale electrification programs can be complex, time-consuming, and resource intensive. In addition to program planning and design that addresses common hurdles, implementation success requires:

- Integration across program functions and even multiple utilities and state agencies.
- Education across vast builder and contractor networks and the customers of multiple utilities.
- Innovation to reduce pain points for all stakeholders at all stages of their involvement with the program.

Yet, implementing an electrification program is just one relatively small component of a utility's operations. To align limited resources with the complexity of electrification programs in a way that will drive success, programs need an implementation partner that can provide a portfolio approach to program delivery. An implementation partner with broad capabilities and deep experience can deliver a turnkey solution that emphasizes integration, education, and innovation.

ICF is a trusted partner for utilities across North America providing data and analysis and holistic program support from impact studies to implementation.



About the authors



Chris Watson

Senior Director,
Beneficial Electrification

Chris.Watson@icf.com

Chris is an expert in the energy, renewables, and energy efficiency sector with over 20 years of experience. He oversees market potential assessments, cost-benefit analysis, program design, and implementation of utility electrification programs across the U.S. and Canada.



Laura Orfanedes

Senior Marketing
Account Director

Laura.Orfanedes@icf.com

Laura has extensive experience in marketing and communications account management, marketing, branding, strategy, communications, creative and collateral development, and customer research. She is responsible for the strategic development and implementation of brand, direct response, and market transformation campaigns, including managing budgets of more than \$2 million annually.



Matt Dugan

Vice President,
Commercial Energy

Matt.Dugan@icf.com

Matt leads our program implementation practice in the Northeast United States. He has more than two decades of experience developing and implementing electric, natural gas, and carbon reduction energy efficiency programs. Matt serves as project director for all of our Northeast U.S. client engagements, ensuring contract and financial management, client satisfaction, client advisory services, staff direction, and overall performance of each program.



For more information, please contact:

Matt Dugan

Vice President, Commercial Energy

Matt.Dugan@icf.com

Laura Orfanedes

Senior Marketing Account Director

Laura.Orfanedes@icf.com

Chris Watson

Senior Director, Beneficial Electrification


Chris.Watson@icf.com

icf.com/energy

 twitter.com/ICF

 linkedin.com/company/icf-international

 facebook.com/ThisIsICF

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About ICF

ICF is a global consulting services company, but we are not your typical consultants. We help clients navigate change and better prepare for the future.

Our experts have been embedded in every corner of the energy industry for over 40 years, working at the intersection of policy and practice. We work with the top global utilities, plus all major federal agencies and relevant energy NGOs, to devise effective strategies, implement efficient programs, and build strong relationships with their customers. From creating roadmaps to meet net zero carbon goals to advising on regulatory compliance, we provide deep industry expertise, advanced data modeling, and innovative technology solutions, so the right decisions can be made when the stakes are high.