



Opinion **Dynamics**

# MARKET STUDY QUALIFICATIONS



Boston | Portland | San Diego | San Francisco

# DRIVING THE CLEAN ENERGY TRANSITION THROUGH INSIGHTFUL AND CUSTOM ANALYSIS



## WHO WE ARE

Opinion Dynamics is the largest independently owned firm specializing in energy research and advisory services. Over the past 30 years, Opinion Dynamics has pioneered approaches to evaluate the technologies and market interventions that aim to address energy, environmental, and societal challenges. Our clients include electric utilities, public utility commissions, regional energy organizations, automakers, energy start-ups, and more. The one thing all of our clients have in common is a thirst for the truth. Whether it's research to scale a pilot, assess the load shift impacts from an intervention, or measure the success of a marketing campaign, we pride ourselves on providing accurate and defensible information.

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- Expertise in Market Program Design, Implementation and Evaluation
  - Decades of Experience in Assessing Load Impacts
  - Unparalleled Reputation for Delivering Customer Insights
  - Support for an Equitable Transition to Clean Energy

WE PROVIDE A COMPREHENSIVE SET OF SOLUTIONS TO THOSE SEEKING FACTUAL ANSWERS TO THE TOUGHEST QUESTIONS. AS A MULTIDISCIPLINARY FIRM, WE ARE OPTIMALLY POSITIONED TO DEPLOY MARKET INSIGHTS, DATA COLLECTION, AND ANALYTICS EXPERTISE TO EFFECTIVELY BLEND INSIGHTS FROM THE CUSTOMER, GRID, TECHNOLOGY, AND INFRASTRUCTURE PERSPECTIVES.



## MARKET INSIGHTS

Our Market Insights team provide our clients with the best way to answer the question “why?”. We seamlessly combine cutting-edge social science methods with data science tools. As a result, we provide our clients with data-driven recommendations to improve program cost-effectiveness and achieve long term market-focused goals.



## EVALUATION

We take an embedded evaluation approach, which allows us to adapt our approaches early in the program design and implementation process to provide valuable insights at key decision points. We work collaboratively with program teams early on, creating a feedback loop to help all parties better understand complex market adoption patterns. Throughout this process, we focus on yielding insights that provide not only the “what,” but also the “why” of electric vehicle adoption, to ensure high degrees of customer adoption and continuous engagement.



## ENGINEERING

Our Engineering Team understands the nuances of the research they conduct and serves as working partners with our clients. Our engineers apply formal engineering training and jurisdictional knowledge of utility infrastructure, to ensure that our clients receive specific analytic insights attuned to the ‘big picture’.



## DATA ANALYTICS

Our Data Analytics team leverages economic, statistic, and behavioral science data methods. Our analytical skills provide insight into the value of infrastructure investment, the differences in customer behaviors and associated impacts to the grid. Working with our Data Management team, we create engaging dashboards that integrate seamlessly with our data management platform translating complex inputs into actionable results.



## DATA MANAGEMENT

Our Data Management team is designed to collect, ingest, and manage the diverse range of data sources found in the energy landscape. Our team of data scientists are adept at accessing multiple data formats, including designing application programming interfaces (APIs), and connecting to existing data channels to access interval data from electric vehicle charging providers and utilities as well as integrating customer survey responses into custom data warehouses. In all cases, our team ensures these data are accurate, clean, and usable, and are stored in such a way that it can be easily accessed by those who need it.

# MARKET TRANSFORMATION EVALUATION QUALIFICATIONS

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Opinion Dynamics specializes in evaluation, research, and design support for novel and emerging program strategies focused on market transformation and decarbonization, ranging from mid and upstream incentives, codes and standards, workforce education and training, marketing education and outreach (ME&O), and emerging technology programs.

Opinion Dynamics is known for excellence in project management, evaluation planning, and establishing appropriate evaluation frameworks to measure market transformation initiatives. We will also leverage our multidisciplinary team of survey, data management, and engineering experts to ensure appropriate primary and secondary data collection and analysis occurs in support of measuring market changes. Measuring market transformation efforts requires stakeholder engagement, embedded evaluation approaches, and continuous reporting and sharing of lessons learned to ensure results are well-documented, accessible, and actionable.

## **Building Code Program Evaluation Experience at the National, State, and Local Levels.**

Our research experience encompasses a range of issues related to codes programs, including exploratory research on best practices and energy savings potential for new codes programs, qualitative research with key stakeholders on various aspects of building codes, assessments of codes adoption and compliance program strategies and activities, and evaluation of compliance levels and energy savings achieved by specific code updates.

## **Expertise in Building Codes and Standards.**

Our staff have direct experience with energy code development, adoption, and impacts assessment. Our research leverages experience participating in and working with multiple diverse stakeholder populations across different jurisdictions. Our broad expertise in developing energy efficiency standards and contributing to code compliance evaluation approaches highlights our deep understanding of stakeholder perspectives that promote or challenge various aspects of building codes. Our work includes engagement with code officials and construction trades to examine code and compliance challenges, plan review, on-site data collection, and energy modeling for residential and commercial projects.

# MARKET CHARACTERIZATION AND EFFECTS

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Opinion Dynamics is a thought leader in the development of new approaches to characterize markets, including both traditional and non-traditional markets (e.g., marketing and outreach, customer behavior, and workforce education and training). We are leading seminal segmentation work in California that provides the CPUC with segmentation schemes to inform future program development, marketing, and outreach efforts. We know the importance of understanding how emerging customer segments impact clients' programs by providing better-defining market baselines and the potential for savings from these new segments.

## **Baseline and Potential Studies.**

Opinion Dynamics has led several recent baseline and potential studies, including work for Cape Light Compact, NYSERDA, Ameren Missouri, and Commonwealth Edison, among others. Our experience includes project planning, primary data collection, segmentation, and sampling, integration of primary and secondary data, preparation of primary and secondary data as inputs into potential models, barriers and adoption research, and development of adoption curves. Our approach to these studies is never cookie-cutter. We recognize the importance of jurisdiction-specific differences and tailor our studies to reflect the unique characteristics of the client's service territory. Our research supports the estimation of both traditional energy efficiency program potentials as well as non-traditional potential areas such as demand response, TOU rates, solar photovoltaic, beneficial electrification, and electric vehicles.

## **Innovation in Survey Design and Data Collection.**

Opinion Dynamics has unparalleled experience in survey data collection and a dedicated survey research team that focuses solely on the implementation of all survey efforts. There are unique challenges in the survey industry due to declining survey response rates and societal and technological changes. To meet these challenges, our survey research team stays on top of the latest research and industry best practices. We also conduct our own research on survey research methods to ensure our surveys produce the highest quality data while minimizing costs. Our team members have expertise across a wide variety of survey data collection modes, including telephone, internet, mail, and in-person interviewing. These in-house capabilities allow us to tailor the data collection strategy to the needs of each project.



# CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC): EVALUATION OF GROUP B PROGRAMS

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Since 2010, Opinion Dynamics has conducted a range of effectiveness evaluation studies for California's statewide market transformation and non-resource acquisition programs, including Codes & Standards; Finance; Workforce Education & Training; Marketing, Education & Outreach; Emerging Technologies Program; Community Choice Aggregators and Regional Energy Networks. Across these areas, Opinion Dynamics has conducted a range of data collection techniques to develop baselines and measure market trends through Delphi panels, focus groups, observational studies, and longitudinal panels, as well as developed program and portfolio metrics to support measuring transformation.



# CPUC: EVALUATION OF TECHNOLOGY AND EQUIPMENT FOR CLEAN HEATING (TECH) INITIATIVE AND THE BUILDING INITIATIVE FOR LOW-EMISSIONS DEVELOPMENT (BUILD) PROGRAM

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The TECH Initiative is designed to accelerate market adoption of low-emissions space conditioning and water heating technologies for existing single and multi-family residential homes across California; the BUILD Program aims to put California on a path to carbon-free homes by 2045 by encouraging the design and construction of all-electric, energy-efficient buildings. This evaluation seeks to assess both short-term and long-term market and program impacts by identifying, measuring, and tracking program performance metrics; assessing the effectiveness of program design, scalability, and policy design; and calculating total expenditures and avoided greenhouse gas emissions, using an embedded evaluation approach to provide insights at key decision points.

# NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY (NYSERDA): CLEAN ENERGY COMMUNITIES RESEARCH AND EVALUATION

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Opinion Dynamics has been conducting market evaluations of the Clean Energy Communities Program for NYSERDA since 2016, which incentivizes local governments to complete clean energy actions, some of which involve partnering with organizations to mobilize community members to adopt rooftop solar and utilize electric vehicle infrastructure. We recently completed in-depth case studies of communities that have moved beyond program activities to conduct green transportation initiatives and further solar programs, including one that provided solar to low- and moderate-income residents.



# CAPE LIGHT COMPACT: CAPE LIGHT COMPACT BASELINE AND POTENTIAL STUDIES

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Opinion Dynamics has led three consecutive baseline/potential studies for the Cape Light Compact, with primary responsibility for study planning, primary data collection activities (including sampling but excluding on-site visits), processing and analysis of primary and secondary data, reporting, and project management. The first study included a comprehensive baseline study with penetration/saturation and barriers/adoption surveys of close to 3,000 residential and over 400 C&I customers, as well as on-site visits with over 300 customers; the subsequent studies leveraged statewide secondary data to update baseline results from the first study cost-effectively.



# CPUC: WORKFORCE EDUCATION & TRAINING

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Opinion Dynamics has been conducting process and impact evaluations for the California workforce education and training initiatives since 2006, which have included an array of workforce education and training programs from K-12 programs, college/university programs, Building Operator Certification Training programs, and multiple programs geared toward industry professionals. We are currently conducting an evaluation of the workforce education and training program with a focus on assessing the causal link between IOU workforce training programs and improved HVAC installation practices; understanding the function and impacts of partnerships with workforce education and training and job placement organizations; and identifying knowledge, skills, and abilities (KSAs) needed for installers of rooftop package HVAC units and heat pump water heaters.



# DOMINION ENERGY SOUTH CAROLINA: MARKET STUDY

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Opinion Dynamics has tracked market trends among customers in the Dominion Energy South Carolina territory for the better half of the past decade. We started with a baseline market assessment of the residential market to determine the penetration and saturation of energy-efficient lighting and HVAC equipment prior to Dominion launching its first energy efficiency programs to customers. The baseline also captured customers' awareness, knowledge, and attitudes toward energy efficiency. Customer segments emerged that allowed Dominion Energy to understand its residential market better and cater marketing strategies to each segment. Research continued three years later to measure change in the marketplace. Methods to support this market assessment involved on-site customer visits, telephone and online surveys, as well as market actor interviews, and a literature review. In a recent market study, Opinion Dynamics collected data for residential and commercial market potential studies and held market actor workshops to discuss potential programs and emerging technologies. This project aggregated and analyzed multiple data sources, including billing history, Experian, and survey and onsite data.



# CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC): HEAT PUMP MARKET CHARACTERIZATION STUDY

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Opinion Dynamics completed a comprehensive statewide market baseline and characterization of the California residential heat pump market, collecting critical information for (1) understanding the potential and barriers for quickly scaling heat pump adoption across California and (2) establishing a baseline from which to measure energy savings, greenhouse gas emissions reductions, project costs, and market effects. Opinion Dynamics was responsible for study planning; conducting interviews with heat pump trade allies, new construction builders, and heat pump program staff in other jurisdictions; conducting a Delphi study with heat pump contractors; data analysis; reporting; and project management.



# CONFIDENTIAL CLIENT: EMERGING ENERGY PROVIDER COMPETITIVE ANALYSIS

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Opinion Dynamics completed a competitive analysis on five emerging energy providers selected by a client to support strategic decision-making and future planning. Key companies included Arcadia Power, Shell New Energies, Tesla, Schneider Electric, and Amazon. Our team gathered market and competitive intelligence about these companies' business models and operating strategies through primary research and discussions with key industry contacts. We then synthesized this information to identify each competitor's key areas of strengths and weakness and the opportunities and threats they pose to the client by gaining market share. The evaluation team then shared key insights through a "Business Disruptors Workshop" and facilitated multiple sequential discussions among a client team with diverse internal roles. These workshops helped the team identify and analyze new business opportunities, leverage potential innovation strategies, stay abreast of the rapidly changing business and political environment, and inform strategic decision-making and future planning around customer product offerings and clean energy business strategy.



# CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC): CODES & STANDARDS

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Starting in the late 1990s, California utilities became more involved in researching, proposing, and promoting efficiency standards through what has become the statewide Utility Codes and Standards Program. Opinion Dynamics is leading a three-year study to assess the gross and net savings from the Program as well as estimate the compliance level and savings achieved by California's Building Energy Efficiency Standards (Title 24 or building codes), California Appliance Efficiency Regulations (Title 20 or appliance standards), and Federal appliance standards.





# NYSERDA: STATEWIDE COMMERCIAL BASELINE STUDY

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Opinion Dynamics led the multi-year New York State Commercial Baseline Study, consisting of a comprehensive commercial baseline study (based on 4,800 survey completes and over 800 on-site visits across 31 study segments), a commercial potential study, and four market assessments (covering heating ventilation and air conditioning, energy management systems, customer decision-making, and energy service companies). Opinion Dynamics was responsible for study planning, the development of several sampling options, primary data collection activities (excluding on-site visits), data analysis, reporting, and project management ([download the full report for more information](#)).

# CPUC: MARKET STUDIES NEEDS ASSESSMENT

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Opinion Dynamics conducted a study to help focus future market studies within California. This study used widely disparate information to not only create a report but also to create an Excel-based tool that California staff are now using. Within this effort, we interviewed 23 stakeholders (including Investor Owned utility staff, regulatory staff, interveners, other evaluation consultations, and program implementers) to understand where good market data existed and which market studies would be worthwhile to pursue moving forward. We compiled and reviewed more than 100 relevant past California studies to determine specifics about the data each study provided. We mined past regulatory decisions for Commission guidance in different areas to help focus on areas of high interest to the Commission. Lastly, we pulled in energy efficiency market potential data available within California to understand where there was high market potential for savings. Opinion Dynamics used this information to find gaps in knowledge and to determine where those gaps aligned with areas of relative importance and created a list of possible market studies that the California Public Utilities Commission is now considering. The report is available at [www.calmac.org](http://www.calmac.org) (search for Calmac ID CPU0104.01). Additionally, Opinion Dynamics is presenting the Excel-based tool to regulatory and utility staff in multiple venues.



# NORTHWEST ENERGY-EFFICIENCY ALLIANCE (NEEA): COMMERCIAL HVAC MARKET CHARACTERIZATION

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Opinion Dynamics conducted a study to estimate the market opportunity in the Pacific Northwest of a new heating and cooling technology, as well as to validate market assumptions about supply, decision-making, and the current state of the market. We used existing data and a literature review to identify key information we wanted to gather during the data collection phase. Data collection included targeting and completing interviews and surveys with commercial and construction industry actors, including heating and cooling system manufacturers, distributors, contractors, and specifiers (i.e., those who work in the construction sector and are involved with large RTU heating systems, such as mechanical designers, consultants, architects, and engineers). We used a mixed-mode approach (phone and web) to reach businesses. In addition, we conducted two working sessions with the client to disseminate findings from the existing data, the literature review, and surveys and interviews.



# CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC): ALISO CANYON MARKETING, EDUCATION, AND OUTREACH EFFECTIVENESS STUDY

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Opinion Dynamics conducted an evaluation of a ME&O campaign following the natural gas leak at the Aliso Canyon Storage Facility near Porter Ranch, California. This study had two overarching goals: (1) to audit and verify Aliso Canyon ME&O activities and (2) to assess the effectiveness of Aliso Canyon ME&O activities.

In the winter of 2015, a major natural gas leak occurred at the Aliso Canyon Natural Gas Storage Facility in the Los Angeles Basin. In the wake of the leak, there was concern that supplies of natural gas in the Los Angeles Basin might not meet periods of peak demand during the summer and winter following the leak. In response, the California Public Utilities Commission (CPUC), in Proposed Decision A.12-08-007, authorized Southern California Gas (SCG) to provide funding for ME&O activities in 2016 to reduce the risk of natural gas and electricity interruptions in the Los Angeles Basin. In response to the CPUC ruling, SCG, with feedback from an advisory group, developed a conservation campaign centered on four main goals to: (1) Raise awareness of the need to conserve energy, (2) Raise awareness of the interdependency of natural gas and electricity (3) Offer strategies and tips for saving energy, and (4) Drive energy conservation activities. A central component of the campaign was the creation of the “Conserve Energy SoCal” brand. The campaign sought to raise awareness of the brand and in addition, to promote “Flex Alerts,” or calls to conserve energy during times of peak demand.

The evaluation team found the campaign was effective at achieving stated goals, as respondent awareness of the Conserve Energy SoCal brand increased throughout the campaign, with the popularity of the campaign’s Facebook post growing considerably throughout the campaign. The campaign also influenced respondents’ attitudes toward energy conservation and influenced more people to take energy-saving actions. In addition, self-reported conservation behaviors increased two and a half months into the campaign as compared to pre-campaign levels. However, incremental effects on behavior were not observed four months and six months into the campaign. Furthermore, the evaluation team was able to detect impacts from the three Flex Alerts called during the campaign period, and Flex Alert customers reduced electricity demand by an estimated 0.024 kWh/hr on average during Flex Alert events. These findings suggest that using the Aliso Canyon emergency campaign appeared to be an effective campaign strategy.

# AMEREN MISSOURI: RESIDENTIAL AND COMMERCIAL MARKET BASELINE STUDY

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Opinion Dynamics is conducting baseline studies every other year across five years to track changes in program target markets, assess Ameren Missouri's impact on the markets, and identify program opportunities. In 2019, Opinion Dynamics completed the first residential and commercial market baseline studies. Data collection included online and quantitative telephone surveys, as well as residential on-site visits. Key study results included adoption curve calculations for key energy efficiency and demand response measures by target segments for both the residential and commercial sectors, as well as penetration and saturation results for key end-uses. The study covered a wide variety of residential and commercial end-uses, including HVAC, water heating, lighting, appliances, solar, energy management systems, refrigeration, motors, and electric vehicles. Study results included penetration and saturation results for key end-uses by target market sectors, as well as adoption curve calculations for both the residential and commercial sectors.



# PACIFIC GAS & ELECTRIC: SAN JOAQUIN VALLEY DISADVANTAGED COMMUNITIES DATA GATHERING PLAN

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Opinion Dynamics led a baseline market study for the San Joaquin Valley Disadvantaged Communities Data Gathering Plan, which was focused on residential households lacking access to natural gas and is governed by Assembly Bill 2672, which seeks to increase access to affordable energy for these communities. As a part of this study, Opinion Dynamics collected utility customer data and billing data and conducted extensive primary research—including a quantitative survey with 2,660 residential customers; in-home visits with 259 survey respondents; and qualitative in-depth interviews with 60 in-home audit participants—that captured over 100 data elements including equipment penetration and saturation; energy costs and burden; health, comfort, and safety concerns; and barriers to fuel-switching.




# PUBLIC SERVICE ENTERPRISE GROUP LONG ISLAND (PSEG): HEAT PUMP BENEFICIAL ELECTRIFICATION MARKET RESEARCH AND POTENTIAL STUDY

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Opinion Dynamics assessed the technical, economic, and achievable energy savings potential associated with the adoption of heat pump technologies in the PSEG Long Island service territory, including air source heat pumps (ductless and ducted), ground source heat pumps, heat pump water heaters, and heat pump pool heaters. Our data and analysis focused on identifying and characterizing the viable fuel-switching combinations and configurations for space and water heating to assess the energy and cost savings impacts of representative fuel-switching combinations. Heat pump adoption is contingent upon a number of technical, economic, and other barriers, which vary by sector and segment. As a first step, we conducted primary and secondary research to characterize the market for heat pumps on Long Island, including market penetration, typical configurations in the residential and commercial sectors, market barriers, and regional trends in the cold climate heat pump market. Primary research included in-depth interviews and focus groups with market actors, including designers, HVAC contractors, plumbers, pool service companies, and heat pump distributors. We leveraged multiple secondary sources, including Opinion Dynamics' 2018 baseline data for PSEG Long Island residential and commercial customers, PSEG Long Island historic program participation datasets, and market research reports from the state and region. Opinion Dynamics provided these inputs and other data to be used to develop a detailed, year-over-year scripted adoption model for each heat pump technology-market segment and primary heating fuel combination. We reported potential market adoption under several scenarios, including the baseline, a scenario offering moderate incentives for fuel-switching, and a scenario modeling the full investment needed to meet PSEG Long Island's targets for increased heat pump adoption under New York's electrification and carbon reduction policies.





# PACIFIC GAS AND ELECTRIC (PG&E): ZERO NET ENERGY (ZNE) COMMERCIAL NEW CONSTRUCTION MARKET ASSESSMENT STUDY

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As part of a team, Opinion Dynamics conducted a market assessment that provided critical insights to characterize the current and future commercial California ZNE market. This research effort included leveraging findings from past studies; developing ZNE building categories; identifying the ZNE baseline and potential; interviewing market actors to understand current and future adoption of ZNE; and synthesizing all results. The secondary and primary research uncovered drivers, barriers, and benefits—including non-energy benefits—for key market actors focused on the next wave of ZNE adoption in California. These market actor interviews spanned a diverse group, including commercial building owners, architects, system designers, and engineers.



Opinion **Dynamics**

FOR MORE INFORMATION, PLEASE CONTACT:

**Jeana Swedenburg**

Director

[jswedenburg@opiniondynamics.com](mailto:jswedenburg@opiniondynamics.com)

BOSTON

PORTLAND

SAN DIEGO

SAN FRANCISCO

