# Evidence for the Clean Energy Transition

Commented [CT1]: Or perhaps "Obtaining Evidence for the Clean Energy Transition"

Achieving net-zero emissions in the United ~~,~~States~~,~~ by 2050 ~~will be~~is critical to averting the worst impacts of climate change at home and abroad. Historic public and private sector investments in clean energy across the country are driving progress toward the "net-zero" goal at an increasingly rapid pace, ~~albeit~~ but there is~~with~~ significant work left to be done. ~~If implemented well, t~~The clean energy transition not only holds the promise of ~~not only~~ helping to limit global warming~~,~~, but of ~~also unlocking more~~creating ~~and better~~ jobs, addressing historic inequities in energy access, reducing pollution and environmental damage, and making the energy system more resilient to disasters. But we cannot take these ~~associated~~ related positive outcomes ~~such as these cannot be taken~~ for granted. At Mathematica, we understand that ~~D~~dedicated investment in evidence and learning is ~~needed~~ vital to understanding whether ~~if the~~ policies and programs ~~that are~~ driving the transition are really~~in fact~~ creating a ~~cleaner,~~ greener, more equitable and resilient future in the United ~~,~~States,~~,~~ and how these ~~critical~~ outcomes can be ~~improved~~ enhanced along the path~~way~~ to net-zero. ~~Mathematica can help.~~

## Evidence to inform and evaluate clean energy

Mathematica strives to improve public well-being with data and evidence that meet the highest standards. Our energy evaluation specialists bring decades of experience generating evidence to ~~inform and~~ evaluate clean energy transitions and their impacts on society and the environment. As a full-service learning partner, we provide those working at the forefront of America's clean energy transition with evidence-driven insights to inform the following:

### Evidence-driven clean energy transition strategies

We help translate high-level energy transition ~~objectives~~ goals into concrete learning agendas for federal agencies and foundations to create more coherent grant making portfolios, facilitate robust reporting on progress and challenges, and inform evidence-driven strategy adjustments. ~~We are~~Examples of this work include:

- Partnering with the Rockefeller Foundation to assess the impact of its e-GUIDE initiative, which aims to make energy planning processes more efficient and effective, increase investment in clean energy, and accelerate the pace of clean electrification in unserved and underserved areas~~.~~
- Evaluating the Clean Cooling Collaborative's progress toward its key strategic outcome of reducing greenhouse gas emissions through more sustainable cooling, while improving energy access in underserved communities~~.~~

**Exhibit 1~~.~~ ~~:~~ Energy evaluation data sources and methods~~.~~**

- Grid data
- Smart meter data
- Satellite data
- Night-light analyses
- Geocoding and mapping
- High~~-~~frequency telephone surveys
- Greenhouse gas emissions
- Utility billing
- Load flow analysis

### ~~Evaluating~~ Evaluations of clean energy investments

Our technical experts can rigorously monitor and evaluate the performance of the full range of ~~grid~~ on- and off-grid clean energy investments. We can deploy a ~~wide r~~rang~~inge combination~~ of innovative and traditional data sources and methods when undertaking clean energy evaluations, as highlighted in Exhibit 1. In addition, ~~W~~we ~~have~~are proficient in the following:

- ~~Carried~~ Conducting~~out~~ performance and impact evaluations that ~~measuring~~ measure the effects of increased power generation from renewable ~~energy~~ sources, expanded and improved electricity grids, incentives to take up on- grid and off-grid electricity solutions, and regulatory reform and institutional capacity-building ~~efforts.~~
- ~~Conducted~~ Conducting longitudinal customer service surveys to measure changes in perceptions of utility responsiveness, performance, and value-for-cost~~.~~
- ~~Used~~ Using experimental design and impact evaluations to assess outcomes of off-grid and distributed energy projects to analyze electricity take-up, spending on electricity, productive use of energy, and the use of electric appliances~~.~~

## Understanding of socioeconomic and environmental outcomes

Our energy evaluations can quantify the full range of socioeconomic and environmental outcomes associated with the clean energy transition.~~:~~

*Energy resilience*

Our energy experts and climate change specialists can ~~leverage~~ use climate and disaster risk data to assess ~~the~~ vulnerabilities facing energy systems and inform future clean energy investments. Our ~~GIS~~ geographic information system experts and software development teams can produce geospatial data platforms to visualize these climate risk assessments~~,~~ and energy vulnerabilities~~, and resilience~~.

We ~~are~~ conduct~~ing~~ multi-year, multi-country ~~impact~~ evaluations that examine the effects of climate adaptation -interventions ~~and resilience building interventions~~ on household~~s~~ and ~~community~~ communities, ~~resilience,~~ shedding light on how ~~how~~ clean energy investments ~~are impacting~~affect ~~people's~~ their resilience to climate change.

*Clean energy jobs*

Our researchers and evaluators bring expertise in analyzing and evaluating employment outcomes from clean energy investments.

- We have a rich history of working with the Department of Labor to provide quantitative and qualitative insights on employment outcomes, training and skills-building initiatives, and behavioral interventions in labor programs.
- We ~~have~~'ve worked with the World Bank to assess how a range of clean energy investments in ~~their~~ its portfolio—from building hydropower plants to investing in energy efficiency—~~contributed to~~ affected employment ~~effects~~ in ~~impacted~~ focus communities.

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**Commented [SH5]:** greenhouse gas emissions, utility billing, load flow analysis

*Energy justice*

Our researchers and analysts are skilled at evaluating the distributional outcomes ~~from~~ of energy transitions across ~~communities and~~ households~~.~~ and ~~Our analysts can~~ provide insights on how clean energy investments affect social outcomes, helping to ~~to demonstrate the extent to which~~determine if energy justice goals are being ~~accomplished~~ met in underserved and disadvantaged communities. And through ~~O~~our full-service data collection and survey center, we can ~~of more than 400 on-call interviewers from across the country can be~~ rapidly~~ly~~ ~~mobilized~~ mobilize more than 400 on-call interviewers from across the country ~~and~~ who are experts at connecting with hard-to-reach participants. We also work closely with community-based organizations that serve disadvantaged communities, helping them to assess and report on grant outcomes to grant-makers. Finally,


- we have worked ~~Our projects~~ with the U.S. Agency for International Development~~USAID~~ and the Millennium Challenge Corporation on projects that ~~have~~ provided rigorous evidence on the relationship between increased energy access and decreased cost on a range of indicators related to well-being, such as ~~(~~ poverty, health, education, job opportunities, and socioeconomic development~~)~~.


## Mathematica, a mission-driven organization

For more than 50 years, Mathematica has been a trusted learning partner to federal, state, and local government agencies~~,~~; ~~as well as tribal authorities,~~ community-based organizations~~,~~; foundations~~,~~; and private sector companies. ~~With over 400 active, evidence-focused projects in the U.S. and internationally, o~~ Our team of more than 1,900 researchers ~~is skilled in quantitative and qualitative research and evaluation methods,~~ generat~~ing~~es evidence and ~~facilitating~~ facilitates learning on more than 400 active, evidence-focused projects in the United States and around the world that ~~helps to~~ inform the design and implementation of our partners' policies, strategies, and programs. ~~Our dedicated climate practice also brings expertise in measuring climate adaptation and resilience outcomes and impacts within and across a variety of sectors, including energy, health, and agriculture.~~

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