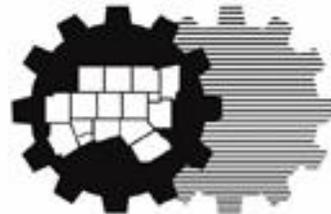


Resources for Energy Efficiency and Infrastructure Resilience

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

AUGUST 28, 2019



North Central Texas
Council of Governments

Resiliency Planning Resources & Tools

Local Government Energy Assurance Guidelines

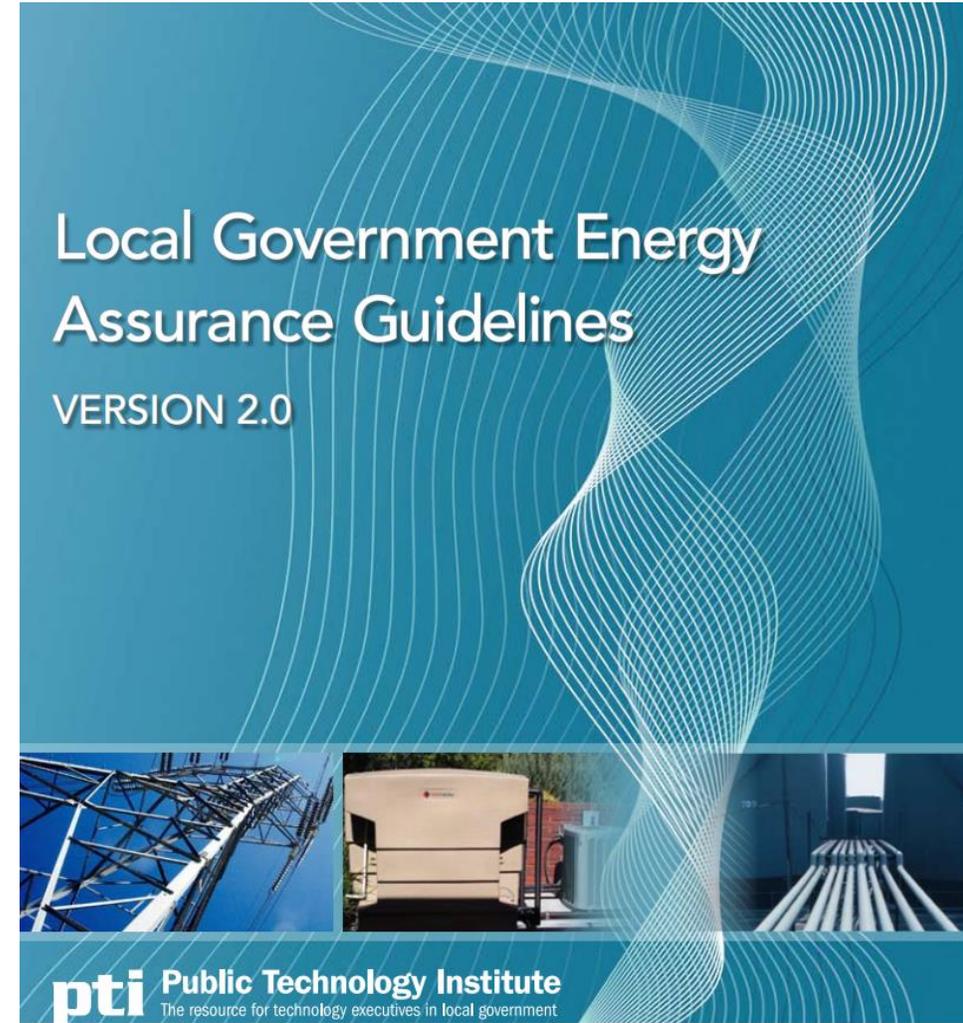
Public Technology Institute

- The goal is to enable communities to make the transition to a pre-disaster planning and risk reduction approach.
- Assist local governments in planning for as well as responding to natural and man-made events and emergencies, often resulting in a decrease or total outage of energy that is needed to sustain critical functions and essential services within a community.
- Assist jurisdictions in the recovery phase, in which energy services vital to the health, welfare, and safety of the resident population are restored.
- Produced because very few local governments have a response and recovery plan that is specific to energy emergencies.

https://www.naseo.org/Data/Sites/1/documents/energyassurance/documents/pti_local_government_energy_guidelines.pdf

Local Government Energy Assurance Planning Resources

<https://sites.google.com/site/ptileap/publications> <http://www.energyassurance.us/>



American Council for an Energy-Efficient Economy (ACEEE):

Enhancing Community Resilience through Energy Efficiency

Enhancing Community Resilience through Energy Efficiency

: Discusses ways in which energy efficiency can increase the resilience of energy systems and the communities they serve. It reviews the resilience-related benefits of:

- efficiency measures
- incorporation of efficiency into resilience planning
- presents four case studies showing how local governments and utilities can leverage energy efficiency to increase community resiliency

Table ES1. Resilience benefits of energy efficiency

Benefit type	Energy efficiency outcome	Resilience benefit
Emergency response and recovery	Reduced electric demand	Increased reliability during times of stress on electric system and increased ability to respond to system emergencies
	Backup power supply from combined heat and power (CHP) and microgrids	Ability to maintain energy supply during emergency or disruption
	Efficient buildings that maintain temperatures	Residents can shelter in place as long as buildings' structural integrity is maintained.
	Multiple modes of transportation and efficient vehicles	Several travel options that can be used during evacuations and disruptions
Social and economic	Local economic resources may stay in the community	Stronger local economy that is less susceptible to hazards and disruptions
	Reduced exposure to energy price volatility	Economy is better positioned to manage energy price increases, and households and businesses are better able to plan for future.
	Reduced spending on energy	Ability to spend income on other needs, increasing disposable income (especially important for low-income families)
	Improved indoor air quality and emission of fewer local pollutants	Fewer public health stressors
Climate mitigation and adaptation	Reduced greenhouse gas emissions from power sector	Mitigation of climate change
	Cost-effective efficiency investments	More leeway to maximize investment in resilient redundancy measures, including adaptation measures

National Institute of Standards and Technology (NIST) Community Resilience Planning Guide for Buildings and Infrastructure Systems

Helps communities develop consistent resilience goals into their comprehensive, economic development, zoning, mitigation, and other local planning activities that impact buildings, public utilities, and other infrastructure systems

Volume I

Describes the six-step planning process

Volume II

Elaborates on how to characterize the social and economic dimensions of the community, any potential impacts and the infrastructure/building performance.

<https://www.nist.gov/topics/community-resilience/planning-guide>



Department of Energy (DOE) Better Buildings



Distributed Generation for Resilience Planning Guide

The U.S. Department of Energy Better Buildings Initiative developed the [Distributed Generation \(DG\) for Resilience Planning Guide](#) to provide information on how DG, with a focus on combined heat and power (CHP), can aid communities to meet their resiliency goals. The guide can be used by a variety of users, including decision makers, state and local policy makers and utilities to gain a better understanding on the role that DG and critical infrastructure (CI) in resiliency planning.

The Efficiency-Resilience Nexus

The [Better Buildings Efficiency-Resilience Nexus](#) describes energy-efficient technologies and practices that contribute to and increase resiliency.

Department of Energy (DOE)

Southcentral Technical Assistance Program with HARC

Promotes Combined Heat and Power (CHP) technology solutions for the industrial and manufacturing sector, critical infrastructure, institutions, commercial facilities, and utilities seeking to reap the many benefits of CHP.

CHP is increasingly recognized as a way to make facilities more resilient against power outages.

Houston Advanced Research Center (HARC) in The Woodlands, Texas has been awarded funding from the U.S. Department of Energy (DOE) to assist public and private entities considering CHP.

More information or to fill out interest survey:

https://www.harcresearch.org/work/CHP_TAP

Department of Homeland Security

Energy Sector – Specific Plan - 2015

National Infrastructure Protection Plan (NIPP) – 2015

The [Energy Sector-Specific Plan](#) details how the National Infrastructure Protection Plan risk management framework is implemented within the context of the unique characteristics and risk landscape of the sector

The Department of Energy is designated as the Sector-Specific Agency for the Energy Sector for NIPP.

<https://www.dhs.gov/cisa/energy-sector>

<https://www.dhs.gov/sites/default/files/publications/nipp-ssp-energy-2015-508.pdf>

Department of Energy (DOE) National Renewable Energy Laboratory (NREL)

Resilience Roadmap – A Collaborative Approach to Multi-Jurisdictional Planning

Resilience Roadmap
A Collaborative Approach to Multi-Jurisdictional Planning

Home | 1 | 2 | 3 | Implement | Fund | Evaluate

Convene | Understand | Prepare | Develop | Prioritize | Commit

Intergovernmental Preparation & Coordination | Planning & Strategy Development | Plan Adoption, Implementation & Evaluation

To mitigate hazards and risks, the Resilience Roadmap offers comprehensive guidance for federal, state, and local entities to effectively convene at the regional level for adaptable and holistic planning. This multi-jurisdictional approach requires major cooperation across boundaries, considerable reliance on partnerships and multi-agency collaborations, and significant utilization of interdisciplinary teams.

Step-by-Step Process

To constructively lead intergovernmental planning efforts with tangible outputs, follow these steps in order:

- 1 Intergovernmental Preparation and Coordination
- 2 Planning and Strategy Development
- 3 Plan Adoption, Implementation, and Evaluation

Learn about how the resilience roadmap process was developed [📄](#).

WHAT IS RESILIENCE?
The ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions through adaptable and holistic planning and technical solutions.

Contact [Eliza Hotchkiss](#) with questions about the resilience planning process.

<https://www.nrel.gov/resilience-planning-roadmap/>

Complete Energy Profile

Completing an energy profile for critical operations or a community is essential for developing resilient infrastructure strategies. Beyond documenting energy consumption patterns and generation assets there are benefits associated with documenting existing utility service provider agreements and long-term regional forecasts for meeting needs in changes to population, demographics, and the economy, for example. One of the most important parts of the energy profile is a clear assessment of what kind of energy is used and how it is used within the jurisdiction. Gathering and evaluating this information also provides a baseline for measuring future progress toward energy reliability.

Stakeholders should gather geographic data related to critical infrastructure systems or facilities which provide daily operations, serve the community as a whole, or provide mission critical services. Desirable information on critical infrastructure could include:

- Data or locations of electric transmission lines, substations, and distribution networks
- Natural gas lines and distribution networks
- Critical community and emergency operations facilities
- Water and wastewater treatment facilities
- Water distribution networks and pumping stations
- Storm-water collection network and treatment/outflow locations
- Fueling station networks
- Fuel types and emergency evacuation routes
- Cellular tower locations, service providers and fiber networks
- Public transportation networks
- Low-income and elderly housing locations
- Emergency shelters, schools, vulnerable populations.

A community or government entity will have different priorities depending on operational needs and critical activities, so this data should be collected with input from the various stakeholders. Some information may be considered sensitive, so access to data or sharing of information may be limited. Understanding where evacuation priorities exist or where energy should be focused due to infrastructure needs will help formulate resilience strategies.

— . . . — . . . — . . .

Resilient Energy Platform

NREL, USAID

Resilient Energy Platform provides expertly curated resources, training materials, data, tools, and direct technical assistance in planning resilient, sustainable, and secure power systems.

The platform enables decision makers to assess power sector vulnerabilities, identify resilience solutions, and make informed decisions to enhance power sector resilience at all scales.



Identify Threats

Identify the potential threats to the power sector and score the likelihood of occurring.



Define Impacts

Define the potential impacts on the power sector that may result from these threats.



Assess Vulnerabilities

Assess the vulnerabilities of the power sector and score their potential severity.



Calculate Risks

Calculate the risks resulting from linked threats and vulnerabilities in a risk matrix.



Develop Solutions

Develop and prioritize resilience action plans based on impact, ability to implement, and cost..



Resilient Energy
Platform



POWER SECTOR RESILIENCE PLANNING GUIDEBOOK

A Self-Guided Reference for Practitioners

Sherry Stout, Nathan Lee, Sadie Cox, and James Elsworth
U.S. Department of Energy's National Renewable Energy Laboratory

<https://resilient-energy.org/guidebook>

Department of Energy (DOE)

Office of Electricity

North American Energy Resilience Model - July 2019

“Our Nation’s prominence is largely enabled by broad access to abundant, reliable, and affordable energy. Our modern electric power system drives our digital economy and elevates our health, safety, and overall standard of living. Without a functioning power grid, nearly every type of critical infrastructure in the U.S.—from banking and water distribution to telecommunications—would grind to a halt. Yet as our Nation’s dependence on the power grid grows, so does the breadth and severity of threats against it.”

A collaboration between DOE, its National Laboratories, and industry, the NAERM will develop a comprehensive resilience modeling system for the North American energy sector infrastructure.

- Enable prediction of the impact of threats
- Evaluation and identification of effective mitigation strategies
- Support for black start planning



Office of Electricity

North American Energy
Resilience Model

July 2019

United States Department of Energy
Washington, DC 20585

Financial Tools & Resources



[BETTER BUILDINGS FINANCING NAVIGATOR](#)

THIS NAVIGATOR HELPS YOU AVOID THE COMPLEXITY ASSOCIATED WITH SECURING APPROPRIATE FINANCING FOR YOUR ENERGY EFFICIENCY PROJECTS



[Commercial property assessed clean energy \(CPACE\) Financing for Resiliency Toolkit](#)

LEARN ABOUT AVAILABLE FINANCING THAT CAN BE USED TO FUND RESILIENCY IMPROVEMENTS TO MAKE BUILDINGS MORE RESISTANT TO NATURAL DISASTERS OR THREATS



[ENERGY SAVINGS PERFORMANCE CONTRACTING \(ESPC\) TOOLKIT](#)

A COLLECTION OF RESOURCES FOR STATE AND LOCAL GOVERNMENTS TO LEARN ABOUT IMPLEMENTING PERFORMANCE CONTRACTING



National Association of State Energy Officials (NASEO) Resources

About NASEO

- **National non-profit association for the governor-designated energy officials from each state and territory**

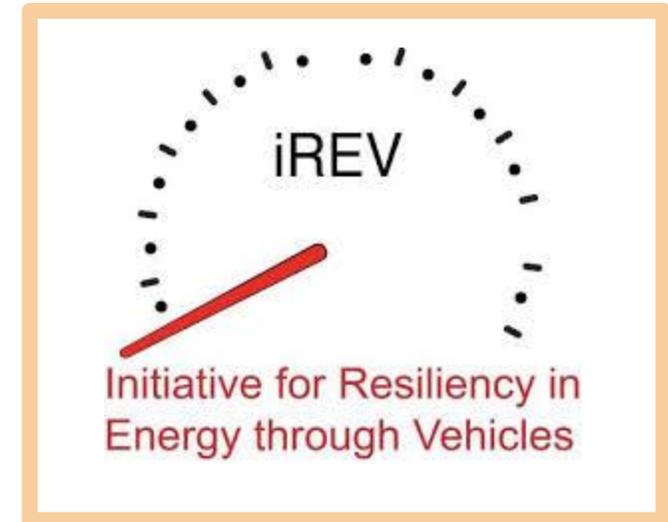
Facilitates Peer
Learning Among
State Officials

A Resource For
and About
State Energy
Offices

Advocates the
Interests of the
State Energy
Offices to
Congress

Initiative for Resiliency in Energy through Vehicles (iREV)

NASEO's [Initiative for Resiliency in Energy through Vehicles \(iREV\)](#) is a nationwide effort to provide resources and tools to emergency planners that addresses the potential for shortages and disruptions in motor fuels during times of emergency through the integration of **alternative fuels** into emergency response activities.



Why Alternative Fuels?

Incorporating alternative fuels into emergency response fleets helps to diversify fuel sources, reduce the potential for fuel shortages or disruptions and decrease harmful exhaust emissions from traditional fuels.



NASEO Resource: iREV Tracking Tool



Initiative for Resiliency in Energy through Vehicles

Tracking Tool



NASEO
National Association of
State Energy Officials

As part of the iREV initiative, NASEO developed a free mapping application known as the “[iREV Tracking Tool](#)”.

This tool identifies where alternative fuel vehicles and infrastructure are located within their communities to optimize their planning and investments based on their specific fuel supply, geography and risk profile.

The screenshot displays the iREV Tracking Tool interface. At the top, there is a 'Location Lookup' section with dropdown menus for 'United States of America', 'Texas', and 'Dallas'. To the right is a 'Location Search' input field and a 'Search' button. The main area is a map of the Dallas-Fort Worth metropolitan area, showing major roads and city boundaries. Overlaid on the map are various data layers, including emergency services (EMS, Fire, Hospital, Police) and fueling stations (Biogas, CNG, E85, Electric, Hydrogen, LNG, Propane). The sidebar on the right is titled 'Available Datasets' and includes sections for 'Emergency Services', 'Fueling Stations', 'Real-Time' (with 'Offline' as an option), and 'Uploaded Data'. The 'Uploaded Data' section includes icons for 'Custom', 'Fueling Station', 'Charging Station', and 'Vehicle', along with a 'Delete Custom Data from Map' button.

iREV

Tracking Tool Overview

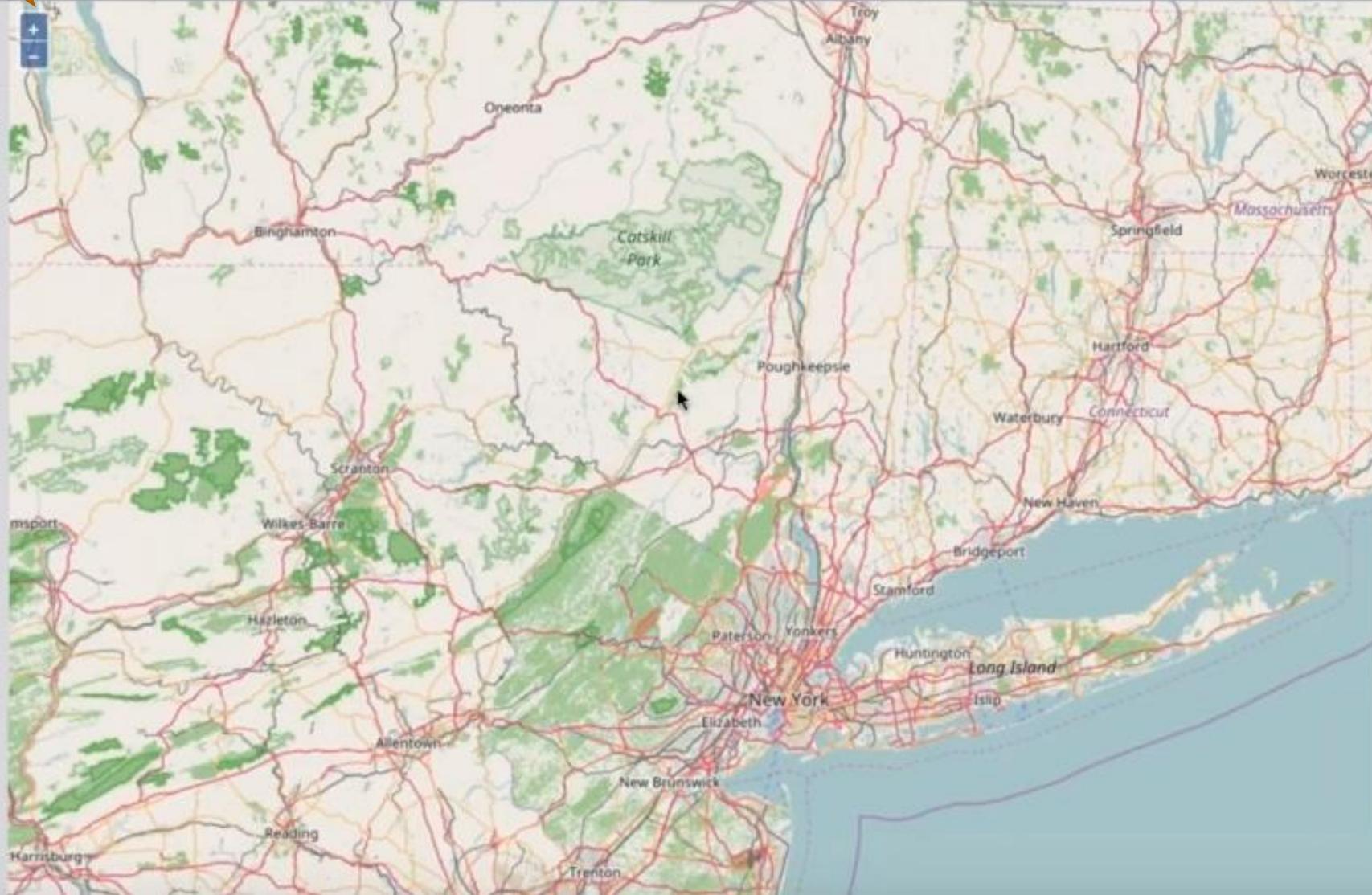


Location Lookup: United States of America New York Navigate to County

Location Search: Search

Map Title:

- MAP** HIDE
 - New
 - Open/Delete
 - Save
 - Export KML
- EVENT** HIDE
 - Draw Event
 - Remove Event(s)
- USER** HIDE
 - Your Profile
- DATA** HIDE
 - Upload Data
 - Data Template
- HELP** HIDE
 - User Guide
 - Data Collection
- ADMIN** HIDE
 - Manage Users



Available Datasets

Emergency Services

- EMS
- Fire
- Hospital
- Police

Fueling Stations

Real-Time **Offline**

- Biodiesel
- CNG
- E85
- Electric
- Hydrogen
- LNG
- Propane

Uploaded Data

- Custom
- Fueling Station
- Charging Station
- Vehicle

[Delete Custom Data from Map](#)



Location Lookup: United States of America New York Navigate to County Location Search:

Map Title:

MAP

HIDE

- New
- Open/Delete
- Save
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EVENT

HIDE

- Draw Event
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USER

HIDE

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DATA

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HELP

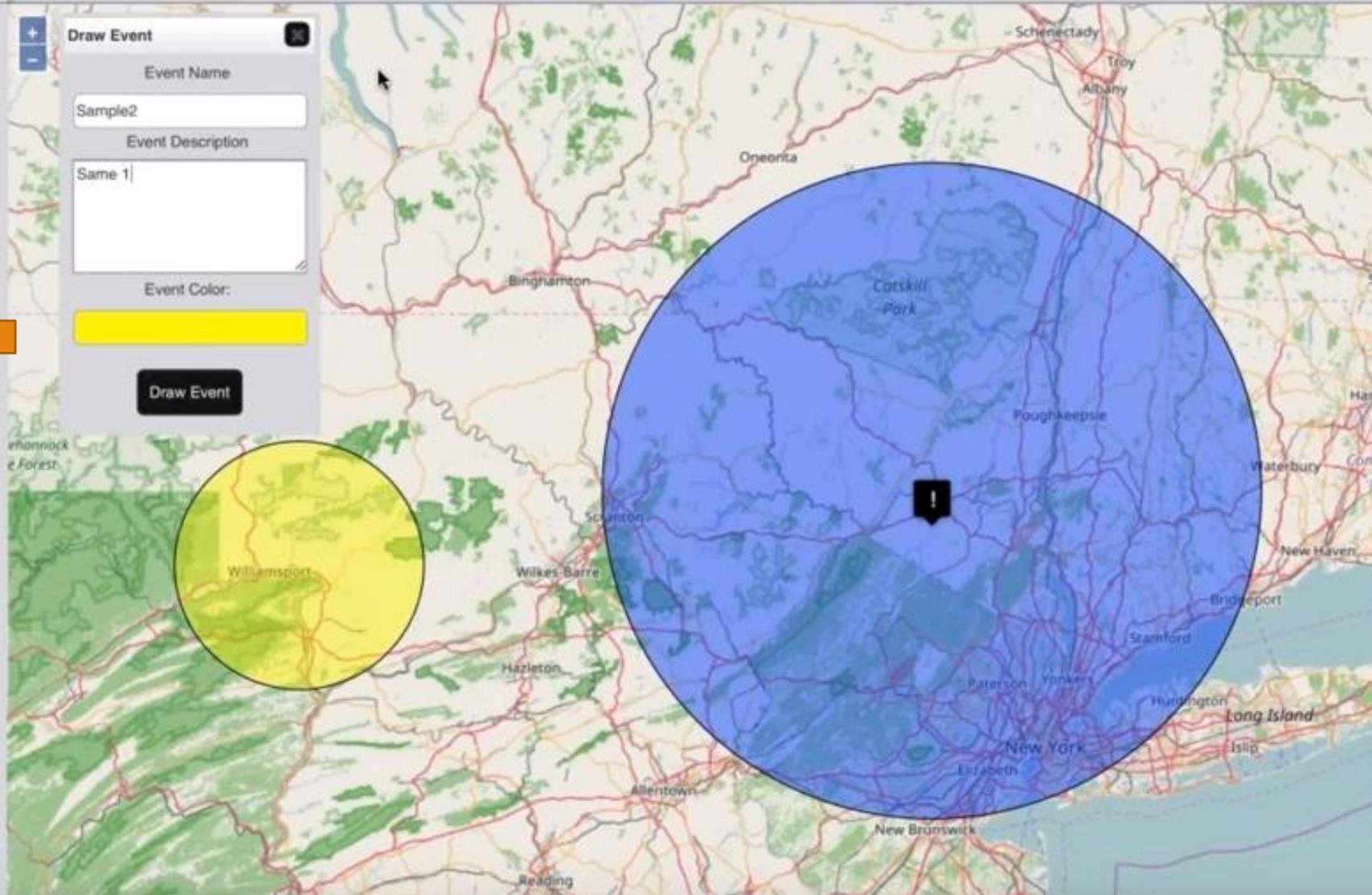
HIDE

- User Guide
- Data Collection

ADMIN

HIDE

- Manage Users



Draw Event

Event Name

Event Description

Event Color:

Available Datasets

Emergency Services

- EMS
- Fire
- Hospital
- Police

Fueling Stations

- Biodiesel
- CNG
- E85
- Electric
- Hydrogen
- LNG
- Propane

Uploaded Data

- Custom
- Fueling Station
- Charging Station
- Vehicle

Location Lookup: United States of America New York Navigate to CountyLocation Search:

Map Title:

MAP

HIDE

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- Open/Delete
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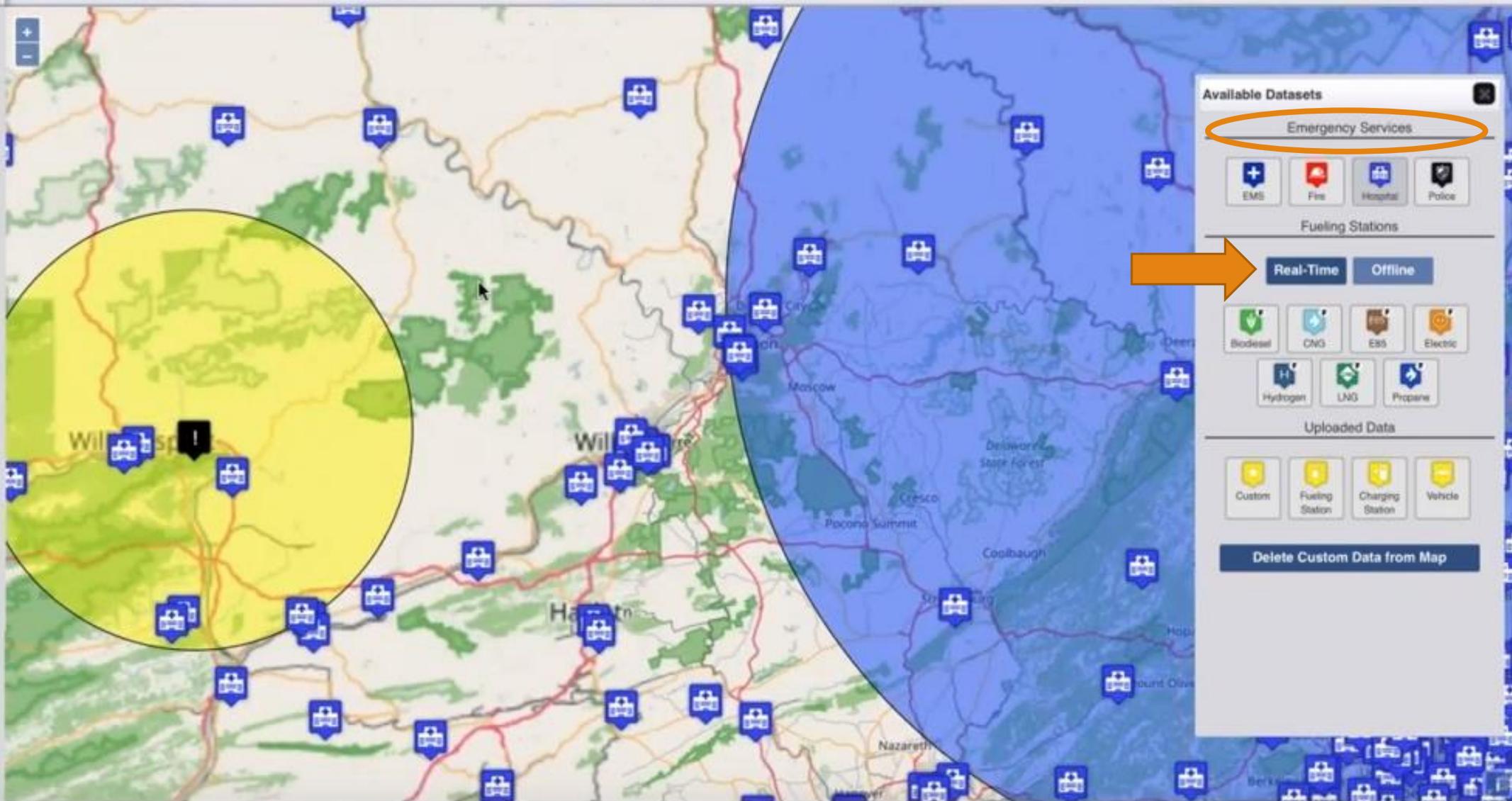
HIDE

- User Guide
- Data Collection

ADMIN

HIDE

- Manage Users

**Available Datasets****Emergency Services**

- EMS
- Fire
- Hospital
- Police

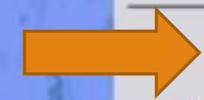
Fueling Stations

Real-Time **Offline**

- Biodiesel
- CNG
- E85
- Electric
- Hydrogen
- LNG
- Propane

Uploaded Data

- Custom
- Fueling Station
- Charging Station
- Vehicle

Delete Custom Data from Map

Location Lookup: United States of America New York Navigate to County Location Search:

Map Title:

MAP

HIDE

- New
- Open/Delete
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EVENT

HIDE

- Draw Event
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HIDE

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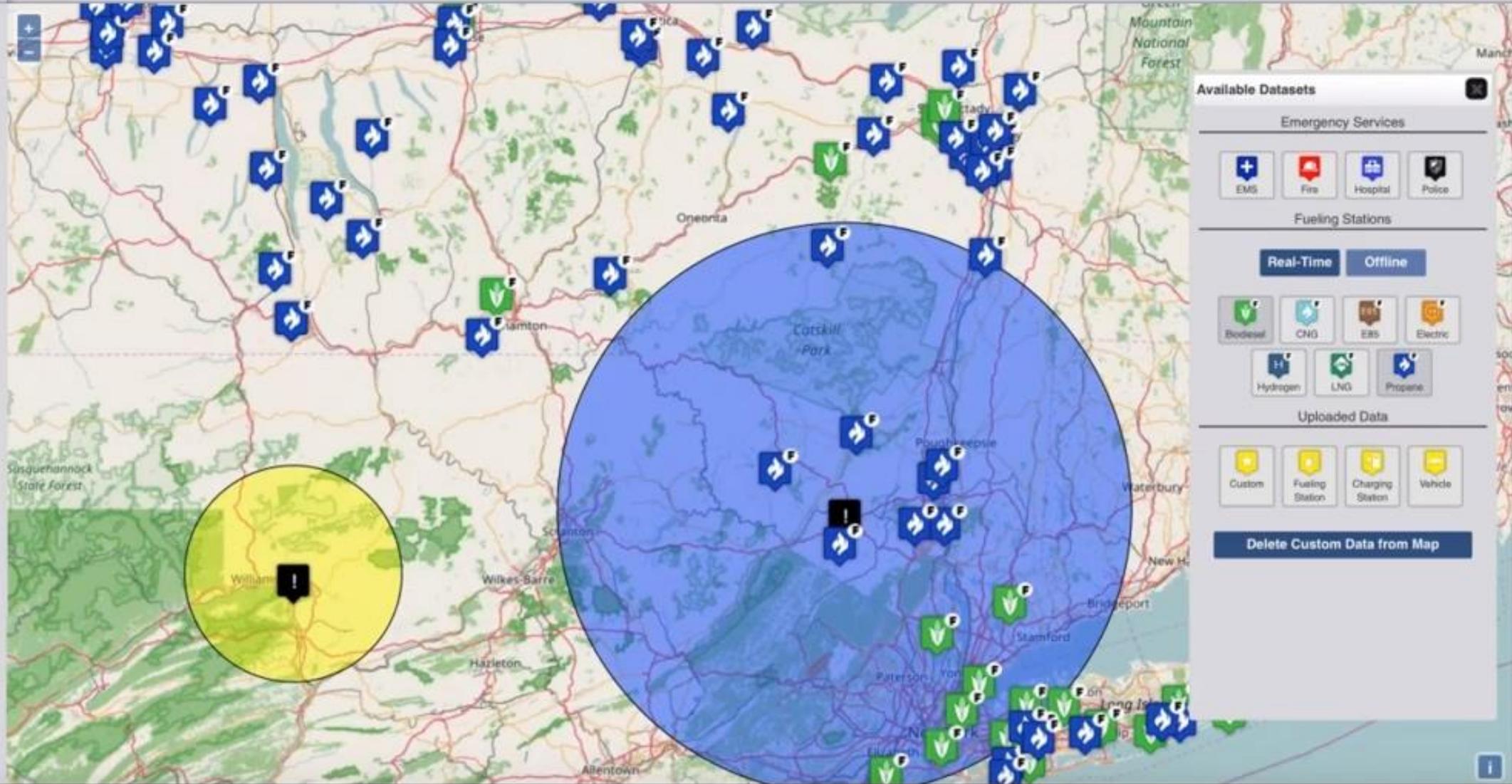
HIDE

- User Guide
- Data Collection

ADMIN

HIDE

- Manage Users



Available Datasets

Emergency Services

--	--	--	--

Fueling Stations

Uploaded Data

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iREV Case Studies: Alternative Fuel Vehicles and Emergency Response

Biodiesel Fueled Vehicles and Emergency Response

Biodiesel fueled snowplow in New York.

June 2016



On-site storage tanks can provide fuel to emergency services

Electric Vehicles and Emergency Response

LAPD purchased 100 BMW i3 electric cars.

June 2016



Ability to export power when the grid is not functioning

Natural Gas Vehicles and Emergency Response

New York/New Jersey Port Authority natural gas vehicle based at Newark Airport, NJ.

June 2016



Natural Gas is normally supplied via underground pipeline, which is more resilient

Propane Vehicles and Emergency Response

Propane fire and rescue vehicle in Sandy Springs, Georgia.

June 2016



Mobile fueling capacity allows fuel to be delivered to remote or inaccessible areas

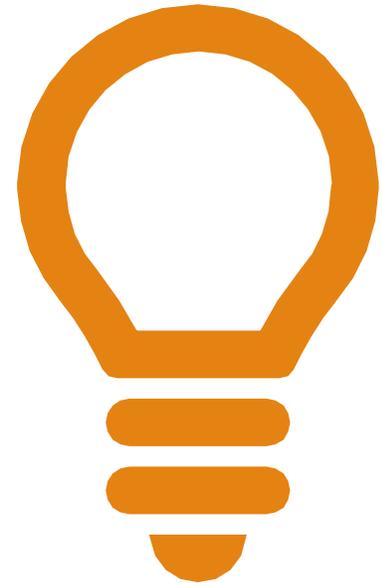
Additional Resources

[Department of Energy \(DOE\) State and Local Solution Center](#)

- ❖ Explore resources related to energy planning, financing energy initiatives, accessing energy data and designing energy programs.

[National Renewable Energy Laboratory's REopt Lite Tool](#)

- ❖ This free tool evaluates the viability of on site grid-connected photovoltaic, wind, and battery storage, potential battery dispatch and size, and the critical load a system can sustain during a grid outage.





SECO

State Energy Conservation Office

SECO Resources

About SECO



Mission Statement: To Increase the Efficient Use of Energy and Water While Protecting the Environment

Focus on Public Sector Facilities – Indirectly Benefitting Taxpayers

Support for Energy and Water Efficiency Project Implementation

- Education and Training
- Technical Assistance
- Project Financing

U.S. Department of Energy State-Level Program Conduit

- State Energy Program (SEP)
- Pantex/Waste Isolation Pilot Plant (WIPP)

SECO Support



Training/Education

- Energy Codes (Workshops & [Adoption Toolkit](#))
- WattWatchers

Technical Assistance

- Preliminary Energy Audits (K-12 & Local Governments)
- Virtual Energy Audits

Financing

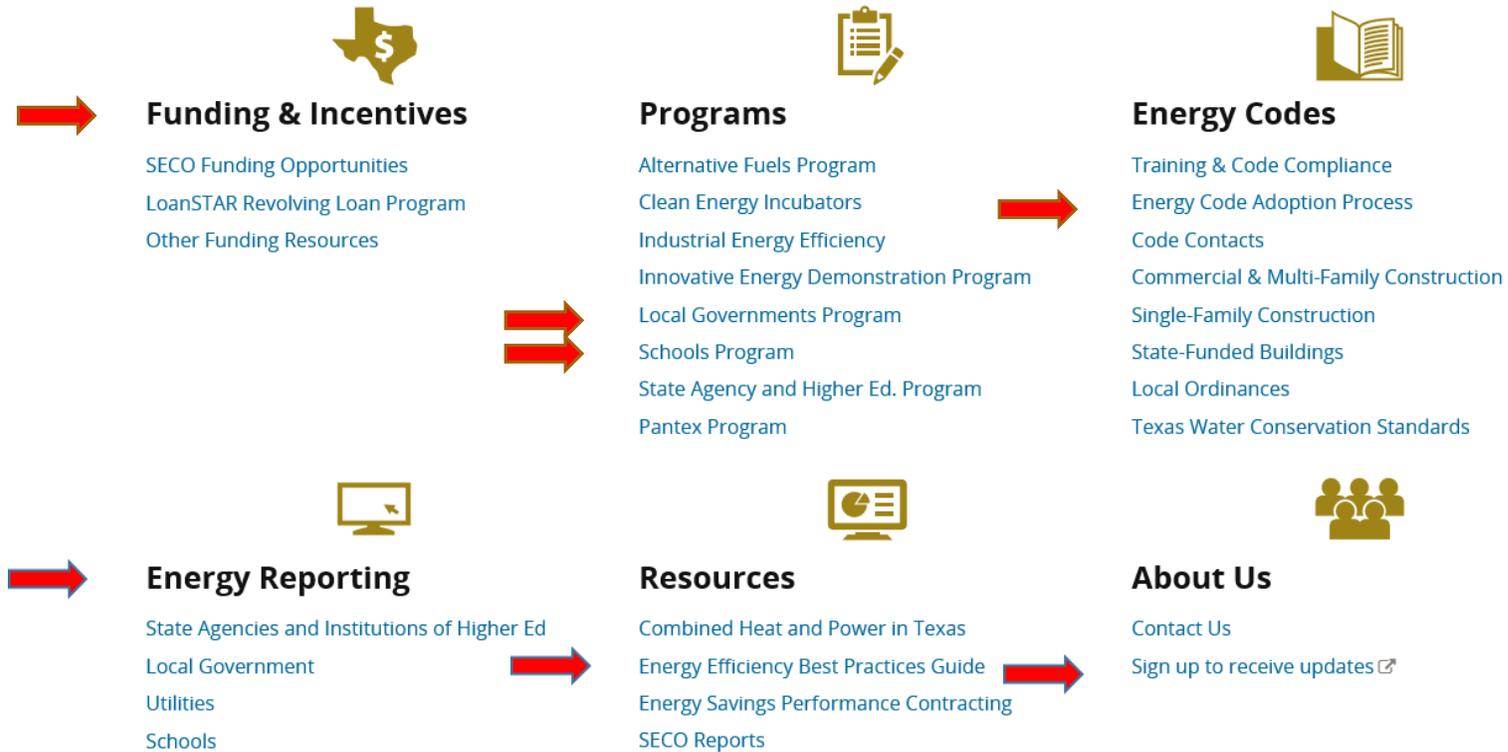
- LoanSTAR Revolving Loan Program
- Energy Savings Performance Contract Guidelines & Education

Programs



STATE ENERGY CONSERVATION OFFICE

SECO partners with Texas local governments, county governments, public K-12 schools, public institutions of higher education and state agencies, to reduce utility costs and maximize efficiency. SECO also adopts energy codes for single-family residential, commercial, and state-funded buildings.



LoanSTAR Revolving Loan

Finances Projects that Reduce Energy/Water/Utility Costs

- Simple Payback Period of 15 Years or Less
- 2% Loan Interest Rate; 1% if Choose ARRA Funds with More Reporting

Open Enrollment Through **August 30, 2019**

- Maximum \$8 Million Loan Per Application
- Maximum 3 Loans per Entity

Program Overview:

https://www.youtube.com/watch?v=4IFuj_5ZeGI

Other Resources, Funding, & Incentives

Database of State Incentives for Renewable Energy:

Local, Utility, State, Federal

www.dsireusa.org

DSIRE®



TEXAS DEPARTMENT OF AGRICULTURE
COMMISSIONER SID MILLER

Texas Department of Agriculture:

City Population < 50,000; County Population <200,000

Water / Wastewater infrastructure; Street / Drainage; Housing

Awards Range from \$75,000 - \$800,000

www.texasagriculture.gov/GrantsServices

Texas Water Development Board:

Financial Assistance Programs

Loans, Grants, Deferred Interest, Combination Grant/Loan

Political Subdivisions, non-Profit and Community Water Supply

Corporations, Private

www.twdb.texas.gov/financial/programs



Consumer Resources – Cities can Advertise to Residents

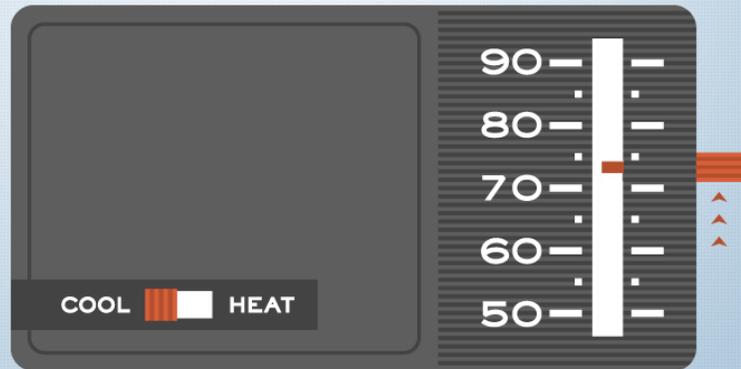
PUC Power to Save Website

POWER2SAVE | TEXAS

ENERGY SAVING TIPS | ABOUT THE GRID | POWER PARTNERS | SCHOOL PROGRAM

Quick Savings for Homes

Turn up your air conditioner 1-2° warmer. (Hint: Move the dial up.)



More Tips for Homes

AIR CONDITIONING >

HEAT >

<http://www.powertosavetexas.net/Home/QuickSavingsHome>

ONCOR Take a Load Off Texas

English / Spanish

ONCOR TAKE A LOAD OFF, TEXAS

GET STARTED RESIDENTIAL BUSINESS FIND A PROVIDER

Together, we can do energy better.
Let's get started.

LOOKING TO SAVE ENERGY FOR...

YOUR BUSINESS?

<https://www.takealoadofftexas.com/en/Pages/Home.aspx>

Texas Property Assessed Clean Energy (TX-PACE) Program

TX-PACE facilitates the use of private capital to finance water conservation, **energy efficiency**, resiliency, and distributed generation projects to eligible properties

PACE is a voluntary program that can be used for the following property types.

ELIGIBLE PROPERTIES



COMMERCIAL REAL PROPERTY

Including non-profit real property such as private schools, medical facilities, churches, etc.



INDUSTRIAL REAL PROPERTY

Including privately owned agricultural real property.

[Industrial Flyer](#)



MULTIFAMILY RESIDENTIAL REAL PROPERTY

Residential real property with five or more dwelling units.

As of August 2019, PACE in North Texas Programs:

- Corinth
- Dallas
- Farmers Branch
- Princeton
- Prosper
- Navarro County
- Tarrant County

Eligible Improvements:

Chillers, boilers, and furnaces • HVAC, BMS, BAS, EMS controls • Lighting • Water heating systems • Energy management systems and controls • Roofing • Windows • Doors • Insulation • Elevator modernization • Pool equipment • Cogeneration or combined heat and power • Heat recovery and steam traps • Solar panels • Wind turbines • Water management systems and controls • Irrigation equipment • Rainwater collection systems • Toilets • Faucets • Greywater systems... and more!

NCTCOG Resources

Conserve North Texas

Clearinghouse of Energy Efficiency, Water Conservation, and Transportation Resources



Resource Types:

- Programs
- Tools
- Calculators
- Case Studies

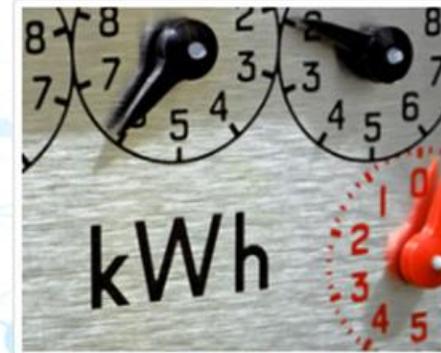
www.conservenorthtexas.org

Topic



Water

Find resources to reduce water use and increase water conservation within the public and private sector.



Energy

Search resources that help reduce energy consumption and increase energy efficiency across all sectors.



Fuel

Explore resources to reduce energy and fuel intensity within the transportation sector.

Go Solar Texas

Texas-Specific Information about Solar

Key Resource Types:

- Best Management Practices
- Cost Benefit Analysis
- Trainings
- Case Studies
- Meeting-in-a-Box

www.gosolartexas.org

Go Solar Texas



Solar power is an emerging clean energy option that can positively impact North Texas' environment and save consumers money on their electric bills. Dallas-Fort Worth is a prime location for solar technology and its growth due to the region's climate and geography. Solar power can provide much of the needed electricity when electricity demand is highest - when it's hot and the sun is shining.

With proper implementation, solar energy will help to improve air quality.



Solar 101

Learn the basics about solar energy, terminology, and equipment.



Steps for Going Solar

Considering installing a solar energy system? Now what? Steps for Going Solar provides details on solar energy systems, costs, tools for determining if solar is right for your property, and more.



FOR MORE INFORMATION

Tamara Cook

Senior Program Manager

Environment and Development Department

(817) 695-9221

tcook@nctcog.org

Lori Clark

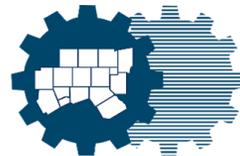
Program Manager

Transportation Department

(817) 695-9232

lclark@nctcog.org

<https://www.nctcog.org/envir/natural-resources/energy-efficiency>



**North Central Texas
Council of Governments**