



Powering Sullivan

Smart Energy Choices for Your Home, Business and Town

From the Sullivan County Office of Sustainable Energy (OSE)

Getting Energy Wise in Sullivan County



**Climate Smart
Communities**
Certified

Sullivan County is proud to be the sixth county and the fifteenth municipality in NYS to achieve certification as a **Climate Smart Community** by the NYS Department of Environmental Conservation. Sullivan County has also been designated a **Clean Energy Community** by the New York State Energy Research and Development Authority (NYSERDA).

Certification recognizes the County’s many significant actions to reduce waste, improve energy efficiency, reduce GHG emissions, and transition to renewable energy, all of which reduce operational expenses for the County. These strategies are also available to County residents and business owners, as well as towns and villages, and there are many incentives and financing models to make these opportunities accessible to all. We hope this Resource Book provides useful information and contacts to help you make your home or place of business and your town or village more energy efficient and economical to run; healthier, safer and more comfortable; and more resilient to the potential impacts of climate change in our region.

About the Sullivan County Office of Sustainable Energy

The Sullivan County Office of Sustainable Energy (OSE) works to develop cost effective projects, policies and practices that make County operations and our surrounding community more sustainable, resilient, healthy, energy efficient and environmentally responsible. The OSE provides research, analysis, strategies, informational outreach and project support on a range of issues relating to sustainability, and works in close coordination with numerous County departments, local and state agencies and community organizations to maximize the resources available to the County and its residents.

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<http://co.sullivan.ny.us/Departments/DepartmentsNZ/OfficeofSustainableEnergy/tabid/3990/Default.aspx>

Contents

Introduction	2
Electric Vehicles and Electric Vehicle Service Equipment (EVSE)	4
Sullivan County Electric Vehicle Infrastructure Reimbursement Program	5
Energy Planning for Your Business	6
Resources for Businesses	7
Energy Planning for Your Home	8
Energy Planning for Farms and On-Farm Producers	9
Energy Planning Resources for Towns and Villages	10
What is an Energy Assessment?	11
About Solar Power	12
Shared Solar or Community Distributed Generation	14
Community Choice Aggregation	15
Other Renewable Energy Options	16
Some Useful Energy Terms	18
The Charges on Your Energy Bill	20
Cost Saving Tips to Reduce Energy Use and Waste	22

About web links in this resource book: We have tried to ensure that the web addresses in this publication are current and accurate, but these resources are constantly changing. Please don't hesitate to call us if you need help with one of these contacts.

Electric Vehicles and Electric Vehicle Supply Equipment (EVSE)

With the recent release of affordable electric vehicles by several high profile companies, Sullivan County expects to see a steady increase in the number of electric vehicles in regular use. In addition, New York State inaugurated a program on April 1, 2017 to offer \$2,000 rebates on the purchase of zero-emissions and plug-in hybrid vehicles.

Sullivan County supports the transition to electric vehicles and the development of a network of EVSE (charging stations), which will help County residents make the transition and will encourage EV drivers to consider Sullivan County as a location to live, work, shop and visit.

The New York State Energy Research and Development Authority (NYSERDA) offers a wide range of information and support to those interested in owning and investing in EV technology. Whether you are seeking to install EVSE at your place of business or are interested in purchasing an electric vehicle, the following links will provide helpful information. To reach NYSERDA by phone, call 1-866-NYSERDA, or (518) 862-1090.

Hosting EVSE at your Business:

<https://www.nyserda.ny.gov/Researchers-and-Policymakers/Electric-Vehicles/Info/Charging-Station-Hosts>

Financing for EVSE: <https://www.nyserda.ny.gov/All-Programs/Programs/ChargeNY>

Rebates for Electric Vehicle Purchase: <https://www.nyserda.ny.gov/All-Programs/Programs/Drive-Clean-Rebate>

866-595-7917

Sustainable Hudson Valley also serves as a regional resource to educate EV consumers through their Drive Electric Hudson Valley initiative.

Choosing an electric vehicle: <http://wp.sustainhv.org/programs/drive-electric-hudson-valley/>

Sullivan County Electric Vehicle Infrastructure Reimbursement Program

The Electric Vehicle Infrastructure Reimbursement Program was established by the Sullivan County Legislature in 2017 to encourage the development of a robust network of electric vehicle charging stations throughout the County.

Local municipalities and public library districts are eligible to apply for reimbursement of up to 50% of the costs associated with the installation of Electric Vehicle Supply Equipment (EVSE) for public use, with a maximum award of \$5,000.

The Program is administered by the Office of Sustainable Energy. Applications are accepted on a rolling basis, and awards are announced three times per year. For more information, please contact the Office of Sustainable Energy, (845) 807-0578.

To download a PDF Application for the

Sullivan County Electric Vehicle Infrastructure Reimbursement Program:

http://webapps.co.sullivan.ny.us/docs/sustainableenergy/Electric_Vehicle_Infrastructure_Reimbursement_Program.pdf



EVSE at the Town of Thompson Town Hall, funding provided by the Sullivan County Electric Vehicle Infrastructure Reimbursement Program.

Energy Planning for Your Business

As a business owner, you know that controlling overhead expenses is vital for your establishment to thrive. By including energy planning in your business plan, you will position yourself to have greater control over your monthly utility costs. You will also gain the opportunity to identify and access incentives for energy efficient equipment, building improvements and renewable energy opportunities that will reduce your long term energy expenses. The following five steps provide a brief look at what to consider when developing your plan.

1. Analyze Your Energy Needs – Baseline and Business-specific

Include systems common to most buildings such as heating, cooling, and lighting, as well as special equipment, machinery, and fixtures specific to your operations. You may also want to consider special challenges such as location and anticipated hours of operation that may have an impact on your energy use.

2. Assess Your Facilities and Systems

NYSERDA offers FlexTech energy assessments by a certified contractor on a cost sharing basis. This process will help you analyze your energy bills and identify the best opportunities to achieve operational savings while making important capital improvements to your facilities.

3. Develop an Energy Plan

Based on your assessment, develop a prioritized list and timeline for your projects, and explore financing options such as Energize NY and USDA grants and loans. Make sure your contractors have expertise in energy efficiency and renewable energy systems. And don't be afraid to go beyond current building energy code to maximize savings.

4. Include Energy Planning in Your Business Plan

Once your analysis and energy plan are complete, include this information in your business plan. Note state and federal tax incentives, grants and low interest loans that will help with the costs of your energy improvements. Understanding your building's age and condition, and having a prioritized list of energy improvements, timeline, and anticipated energy cost savings and payback period, will help you build long term, sustained success.

5. Monitor Energy Costs and Savings Month-to-Month and Year-to-Year

Use an energy accounting software such as the EPA's free *Portfolio Manager* program to track your progress. You will be able to track your savings, troubleshoot and identify future facility improvements that may further reduce your expenses.

Resources for Businesses



Sullivan County joined Energize NY in 2017, enabling commercial and non-profit property owners to access flexible, customized financing for energy efficiency and renewable energy. Office, hospitality, retail, institutional, multifamily, light Industrial, nonprofits, and commercial-ly-owned residential facilities are eligible. Energize NY offers long-term financing at competitive rates, and the NY State PACE (Property Assessed Clean Energy) Finance mechanism allows for loan repayment for energy-related building upgrades as a special charge on your property tax bill. Energize NY can finance clean energy projects such as: lighting, solar electric, chillers, energy storage, biomass, insulation, energy efficient heating and cooling, smart controls and combined heat and storage. **914-302-7300, option 2**

<http://commercial.energizeny.org/energize-ny-finance>

NYSERDA (NY State Energy Research and Development Authority)

NYSERDA's web pages offer energy saving tips for businesses and industry, and a range of resources to help you make smart energy choices for existing buildings or new construction. NYSERDA's FlexTech program offers comprehensive energy studies for efficiency and renewable energy options. **1-866-NYSERDA** <https://www.nyserdera.ny.gov/Business-and-Industry>

USDA Rural Energy for America

USDA offers guaranteed loans and small grants for rural small businesses to finance energy efficiency improvements.

(315) 736-3316 Ext. 129

<https://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency>

EPA (US Environmental Protection Agency)

EPA's Energy Star pages offer a range of programs for business, industry and non-profits to save money on energy expenses, including the agency's free energy monitoring software, **Portfolio Manager**.

<https://www.energystar.gov/buildings/facility-owners-and-managers?s=mega>

<https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager>

Energy Planning for Your Home

Sullivan County residents have many options to help them save money on energy bills, make their homes safer, healthier and more comfortable. The following agencies have programs that can help.

NYSERDA (NY State Energy Research and Development Authority)

Start your energy project by getting a free or low cost home energy assessment through NYSERDA. Your assessment report will include recommended measures, from low- or no-cost do-it-yourself options to bigger projects that can help you save substantially on your energy bills. NYSERDA offers access to low-interest financing for eligible energy improvements including solar installations. Homeowners can also learn about high-efficiency/low emission wood heating systems, and incentives for wind energy systems.

General Information 1-866-NYSERDA <https://www.nyserda.ny.gov/Residents-and-Homeowners>

NYSERDA programs for home energy assessments and financing assistance for energy improvements for low/moderate income

<https://www.nyserda.ny.gov/All-Programs/Programs/Assisted-Home-Performance-with-ENERGY-STAR>

NYS Housing and Community Renewal

NYSHCR provides weatherization resources to help low and moderate income residents improve heating efficiency through insulation upgrades and furnace repair or replacement, plus other measures to make homes safer, more comfortable and more economical.

518-474-5700 e-mail at weatherization@nyshcr.org <http://www.nyshcr.org/Programs/WeatherizationAssistance/>

HEAP (Home Energy Assistance Program) helps low-income people pay winter heating costs (November through April).

HEAP main contact: SC Department of Social Services, **(845) 807-0142** Monday through Friday

After Hours Emergency contact: SC County Sheriff's Department, **(845) 794-7100** Monday through Friday

NYS Office of Temporary and Disability Assistance Hotline at 1-800-342-3009. <http://otda.ny.gov/programs/heap/>

Energy Planning for Farms and On-Farm Producers

Energize NY, NYSERDA and USDA all offer financing programs for farmers and on-farm producers to secure energy assessments, implement energy efficiency retrofits, purchase energy efficient equipment, and install renewable energy systems to power farm operations. Both NYSERDA and USDA offer incentives in addition to financing.

 **ENERGIZE NY** (914) 302-7300 <http://commercial.energizeny.org/energize-ny-finance>

Energize NY offers long-term financing at competitive rates. The NYS PACE (Property Assessed Clean Energy) finance mechanism allows for loan repayment for energy-related building upgrades as a special tax charge right on your property tax bill.

NYSERDA 1-866-NYSERDA

Energy assessments for farm operations Farm owners can get a free energy audit through NYSERDA and receive a report with estimated savings or energy generation for each recommended improvement.

<https://www.nyserderda.ny.gov/Business-and-Industry/Agriculture>

<https://www.nyserderda.ny.gov/All-Programs/Programs/Agriculture-Energy-Audit>

Wind Energy Customers can include residential, commercial, institutional or government users. The maximum equipment size is 2 MW per site per customer. NYSERDA's incentive cannot exceed 50% of the total installed cost of the system.

<https://www.nyserderda.ny.gov/All-Programs/Programs/Small-Wind-Program>

USDA Programs USDA NY (315) 736-3316 Ext. 129

Energy efficiency, Rural Energy for America Guaranteed loans and small grants for rural small businesses and agricultural producers, for renewable energy systems and energy efficiency improvements.

<https://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency>

Energy Planning Resources for Towns and Villages

The Climate Smart Communities (CSC) Program & Climate Action Planning Toolkit

New York State's **Climate Smart Communities** Program provides resources to help municipalities reduce energy costs, decrease greenhouse gas emissions (GHG), and adapt to the potential impacts of climate change at the local level. Towns and villages that take the Climate Smart Communities Pledge receive extra points towards qualifying for NYS funding for a variety of planning and infrastructure grant opportunities.

518-402-8448 <http://www.dec.ny.gov/energy/76483.html>

Portfolio Manager This free software from the US EPA will help your town track and analyze building energy use and quantify GHG reductions and cost savings. <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager>



CSC Roundtable in Bethel

ICLEI-Local Governments for Sustainability ICLEI is an international network of local governments that provides tools and strategies for reducing GHG emissions and improving sustainability and resiliency. <http://icleiusa.org/>

NYSERDA Energy Efficiency for Local Governments Financial assistance, technical assistance and training opportunities to help with municipal buildings, fleets, and renewable energy. <https://www.nyserdera.ny.gov/Communities-and-Governments/Local-Governments>

NYSERDA also provides NYS Energy Code training for town officials and code enforcement officers. <https://www.nyserdera.ny.gov/All-Programs/Programs/Energy-Code-Training>

Green Purchasing The National Association of State Purchasing Officials offers a step by step process to help municipal purchasing officials identify key issues and opportunities. <http://www.naspo.org/green/index.html>

What is an Energy Assessment?

An energy assessment (sometimes called an energy audit) is a “checkup” for homes, commercial buildings and municipal facilities, conducted by a qualified contractor who examines existing conditions and identifies areas where improvements can be made. To qualify for access to NYS financing and incentives to help you improve the energy efficiency of your property, your energy assessment must be conducted by a NYSERDA-approved contractor who is accredited by the Building Performance Institute (BPI).



The blower door apparatus

The contractor makes a visual inspection of the living or working space, attic and basement (or crawl spaces), and using special diagnostic equipment. This equipment includes a blower door apparatus and a thermographic camera, which help the contractor identify where air leaks are located and how much air is leaking from the building. The contractor also performs health and safety tests to check that major combustion appliances (furnace, boiler, hot water tank and stove) are operating safely.

The assessment will identify specific cost-effective measures that will save you money on your energy bills. Your contractor analyzes the assessment data and provides a written report with valuable information about the energy efficiency of the building and recommendations for measures that may include weather stripping; caulking; repair or replacement of heating or cooling systems; thermostat upgrades; water heater repair and replacement; repair or replacement of storm windows, permanent windows and exterior doors; repair or

replacement of major household appliances; installation of solar thermal heating or hot water systems; insulation; replacement of inefficient light bulbs and lighting fixtures; opportunities for solar PV systems to supply electricity; and other renewable energy options.



Thermographic cameras reveal air leaks that can be remedied with insulation.

About Solar Power

Solar PV (Photovoltaic) A **solar cell**, or **photovoltaic cell**, is an electrical device that converts the energy of light from the sun into electricity. Solar cells are the building blocks of photovoltaic modules, otherwise known as solar panels. The components of a solar energy system are:

Solar Panels – Convert the sun’s rays into direct current (DC).

Inverter – Converts DC current into alternating current (AC) to power the building.

Electric Panel (Breaker Box) – Distributes electricity to circuits in the building.

Utility Meter – Keeps track of the amount of electricity produced and sends excess power into the utility grid to offset nighttime electricity use (net metering).

Utility grid – The system of wires and meters that distribute electricity from generating sources to individual buildings.

Monitoring system – Computerized controls that track energy production and proper operation.

Balance of System (BOS) – Racking and mounting equipment, wires, conduit, etc.



14.96 kW solar demonstration project at the County's Mobility Management facility in Bethel



Inverter unit at the County's 49.92 kW solar array at the Travis Building in Liberty



The County's 2.4 MW solar array in Liberty powers the Adult Care Center, Shared Health Clinic and six other County facilities.

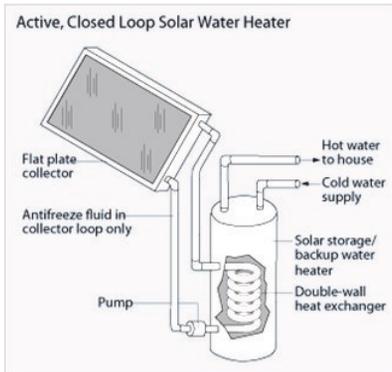


Illustration: US Department of Energy

Solar thermal systems use rooftop solar collectors to heat water for household use, for pools and hot tubs, or for hydronic household heating systems. Low energy pumps circulate water through the solar collectors. Indirect circulation systems are recommended in climates that are prone to freezing temperatures. In these closed loop cold climate systems, the pumps circulate a non-freezing heat transfer fluid in a closed-loop system to heat the water.

The benefits of solar are environmental and economic.

Solar energy systems do not produce noise, vibration, odors, emissions or contaminated runoff and do not contribute to soil erosion. They can be completely removed with site restoration to the property's prior condition.

Environmental and health benefits include elimination of CO₂ and other GHG emissions associated with electricity generation and the extraction (mining) of coal, oil or natural gas for electricity generation. Also, by fostering a cost-effective switch to electric-powered heating systems, solar energy can help improve indoor air quality in the home due to elimination of combustion appliances.

Jobs in the solar industry have tripled since 2010, and reached 260,077 in 2016, according to The Solar Foundation's annual National Solar Jobs Census. The solar industry added \$84 billion to the US GDP in 2016. Overall, renewable energy accounts for 64% of new electricity generation according to the National Renewable Energy Laboratory (NREL).

Shared Solar or Community Distributed Generation

Shared Solar projects, also known as Community Distributed Generation, expand access to solar energy generation to utility customers who cannot site solar directly on their own property. Shared solar enables multiple customers to receive net metering credits from a single solar energy installation. Residents and businesses who participate in shared solar buy shares in a larger community solar project according to their electric use. There are a number of shared solar projects in Sullivan County.

A shared solar project involves a **Sponsor**, a **Solar Developer**, and **Members**. A project **Sponsor** can be a solar developer, a community nonprofit, a private for-profit company or a municipal government. The **Sponsor** manages the project over its 20-30-year lifetime, sells shares to subscribe the project, manages the project members, interfaces with the utility and operates and maintains the solar facility. The **Solar Developer** builds the array.

Members are the off-takers or subscribers who use the electricity. Each project needs at least 10 members. Members can be any utility customer in the same utility jurisdiction as the project and the same NYISO load zone. Energy generated by the project is credited to the Member's utility bill. The solar-generated electricity is distributed to project members based upon their documented electricity usage.

There are two ownership models: **Direct Ownership** and **Third Party Ownership**. In **Direct Ownership** projects, Members make a partial or full up-front payment, calculated as dollars per Watt of electricity generation. Real savings are deferred until the investment is recouped, but Members may achieve a higher Return on Investment (ROI) over the long term.

In a **Third Party Ownership** project, the Members enter into a lease or Power Purchase Agreement (PPA) arrangement with the developer as sponsor. The sponsor owns the solar facility, and there are no upfront construction costs to members.

The **NY-SUN** program provides comprehensive information on solar projects in NYS.

NY-SUN: <https://training.ny-sun.ny.gov/community-distributed-generation-community-solar>

Community Choice Aggregation

Community Choice Aggregation (CCA) is a power procurement model that allows municipalities (cities, towns or villages) to negotiate electricity prices for all of their residents and small businesses. The municipal CCA replaces the utility as the default purchaser on behalf of eligible households and businesses. By “aggregating” or combining the purchasing power of the group, the CCA can secure a lower price for electricity and can choose to purchase electricity from renewable sources such as solar, wind and micro-hydro. The utility remains responsible for delivering the electricity and for billing. CCAs can offer energy efficiency measures to customers and integrate local renewable energy projects like shared solar. The NYS Public Service Commission has established guidelines for the creation of CCAs at the municipal level.

All residential and small business utility customers are eligible to participate. Most successful CCA programs are organized on an “opt-out” basis, meaning that utility customers are automatically enrolled unless they elect to “opt out.” Utility customers who have already chosen to purchase their electricity from an ESCO (Energy Service Company) can elect to be enrolled on an “opt-in” basis.

The **municipality’s** first step is to pass a non-binding resolution indicating its intention to explore the possibility of creating a CCA. Then the municipality drafts a local law implementing the CCA, and holds a public hearing to give town residents the opportunity to comment. After passing the local law, the municipality identifies and enters into a memorandum of understanding with an organization that will serve as the **administrator** of the CCA, laying out the roles and responsibilities of each partner. The town can also work with neighboring municipalities to create a CCA, which increases the customer pool and the CCA’s ability to negotiate a favorable price.

The municipality can serve as the **administrator** of the CCA, or may choose to work with a non-profit or other organization with expertise to serve as the administrator. The administrator presents an implementation plan and a data protection plan for safeguarding the privacy of customer records, and conducts an extensive educational campaign to inform town residents about the CCA. The administrator initiates a bid process to purchase electricity for the community from an ESCO. Once the bid process is complete and electricity rates are set, customers have the opportunity to opt out of the program if they choose.

<https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Communities/Clean-Energy-Communities-Program-High-Impact-Action-Toolkits/Community-Choice-Aggregation>

Other Renewable Energy Options

Wind turbines use the energy in the wind to generate electricity. The economics of wind power depend upon the type of turbine, the annual average wind speed at the location, and other factors. Sullivan County has areas of significant wind resource. NYS has incentives available for small turbines to power individual homes, farms or businesses, and guidance resources for the development of larger scale wind installations.

For small-scale wind power:

NYSERDA informational resources:

<https://www.nyserdera.ny.gov/Researchers-and-Policymakers/Power-Generation/Wind/Small-Wind>

To find out if there is a viable wind resource in your area: NYSERDA's Small Wind Explorer web site can help you determine whether you have a significant wind resource on your property. Click on your location on the map, or enter your address to generate a wind report for your location. <http://nyswe.awstruepower.com/>

For large scale wind power: NYSERDA informational resources: <https://www.nyserdera.ny.gov/Researchers-and-Policymakers/Power-Generation/Wind/Large-Wind/New-York-Wind-Energy-Guide-Local-Decision-Makers>

To explore prime locations for large-scale solar in Sullivan County, see the County's Market Assessment for Wind Energy Report: http://webapps.co.sullivan.ny.us/docs/dpem/resources/Market_Assessment_for_Wind_Energy_in_Sullivan_Co.pdf

Micro-Hydro energy systems harness the energy of water flow to generate electricity. They are generally sized according to the natural flow of water in a stream to produce between 5kW and 100 kW of electricity, and do so without dams or reservoirs or other permanent diversions of water from the natural system.

The US Department of Energy provides extensive information on micro-hydro systems: <https://energy.gov/energysaver/microhydropower-systems>

Geothermal HVAC (Ground Source Heat Pumps) Geothermal heating and cooling systems use the relative constancy of temperatures 4 to 6 feet below the earth's surface to heat and cool a building, using an underground loop filled with water, a heat exchanger, and pumps that run on electricity. They are considered fossil fuel-free if the electricity is sourced from renewable generation (wind or solar).

For more information on Ground Source Heat Pumps:

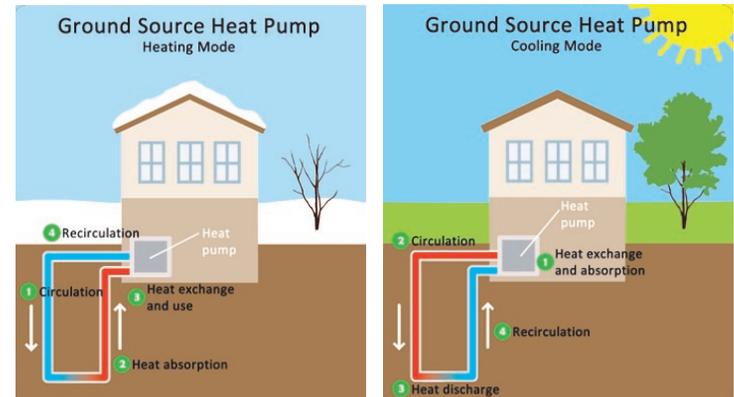
EPA

<https://www.epa.gov/rhc/geothermal-heating-and-cooling-technologies>

<https://www.nyserdera.ny.gov/Researchers-and-Policymakers/Geothermal-Heat-Pumps>

Information on NYSERDA rebate program: 518-862-1090

<https://www.nyserdera.ny.gov/All-Programs/Programs/Ground-Source-Heat-Pump-Rebate>



Illustrations: US Environmental Protection Agency (EPA)

Some Useful Energy Terms

Blower Door Test: A test to determine the air infiltration rate of a building. A powerful fan pulls air out of the building, lowering the air pressure inside. The higher outside air pressure then flows in through all unsealed cracks and openings. The apparatus consists of a frame and flexible panel that fit in a doorway, a variable-speed fan, a pressure gauge to measure the pressure differences inside and outside the building, and an airflow manometer and hoses for measuring airflow. The energy assessor may use a smoke pencil or a FLIR camera to detect air leaks.

Demand Load: The peak electrical demand a electric utility must be prepared to supply to meet a customer's needs. Commercial buildings may be charged a fee in addition to the cost of the electricity they consume, based upon the capacity or "demand load" the utility must be able to supply at all times to that electric customer.

Energy Grid: The network of generators, power lines and other infrastructure components that are coordinated to deliver electricity to customers at various points.

ESCO (Energy Service Company): A non-utility business that provides gas or electric commodity or that installs energy efficient and other demand-side management measures in facilities.

GHG (Greenhouse gases): GHGs are emissions dispersed in the earth's atmosphere that trap solar heat. The most relevant are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases (hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride). Their impact is often expressed in CO₂ equivalents or CO₂e, a unit of measure that expresses the impact of different GHGs in terms of the amount of CO₂ that would produce the same amount of warming.

The biggest source of CO₂ is the burning of fossil fuels like coal, oil, and gas to make electricity, power cars and trucks, and heat buildings. Methane comes from landfills, coal mines, agriculture, and the production of oil and natural gas. Nitrous Oxide comes from the use of nitrogen fertilizers, from burning fossil fuels, and from disposal of wastes. Fluorinated gases are man-made industrial gases used in refrigeration, air conditioning and as propellants in aerosols.

kW (kilowatt): A unit of power equal to 1,000 watts. Ten 100-watt light bulbs demand 1,000 watts or 1kW of electricity for the entire time they are illuminated.

kWh (Kilowatt hours): Units of power consumption over time. One 100-watt light bulb burning for 10 hours consumes 1,000 watt-hours or 1 kWh of electricity.

NYISO: New York State Independent System Operator is a non-profit corporation responsible for operating the state's bulk electricity grid, administering NY's wholesale electricity markets, conducting long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system. The NYISO delineates 11 zones across NYS: Sullivan County falls within Mohawk Valley (Zone E) or Hudson Valley (Zone G).

Peak Demand Hours: For a utility, a single half-hour or hourly period which represents the highest daily point of customer consumption of electricity.

Thermographic Camera: A device that forms an image using infrared radiation emitted from a heat source. Thermographic cameras help locate air leaks that cause heat loss in winter and cooling loss in summer.

Utility Load Zone: A geographical division of the Service Territory assigned to a single utility such as NYSEG, Orange & Rockland or Central Hudson.

Watt: One watt is a unit of power equal to that available when one joule of energy is expended in one second. The watt was named after Scottish engineer James Watt (1736–1819).

The Charges on Your Electric Bill

Your electricity bill contains a number of charges that may seem a bit mysterious. One reason your bill may seem complex is the fact that in New York State, electricity generation was separated or “decoupled” from electricity delivery in the 1990s. This decision enabled customers to choose an electrical supplier (Electrical Service Company or ESCO) on the basis of pricing or in order to choose to buy electricity generated by renewable technologies. Customers who do not choose an ESCO are automatically enrolled in one of the utility’s affiliated or partner energy suppliers. Regardless of the electricity supplier, your utility company (NYSEG, Orange & Rockland or Central Hudson) is responsible for the delivery of that electricity, maintenance of the lines and systems, metering, billing and providing customer service.

Some charges are fixed, but many are based upon your actual electricity consumption. You can reduce all of the charges that are calculated as a **cost per kilowatt hour (kWh)** of consumption by improving your building’s insulation, installing energy efficient appliances and LED lighting, adopting energy-saving habits, and installing renewable energy systems.

Basic Service Charge: Includes metering, billing, line maintenance, and may include a minimum usage cost and is billed whether or not you use the electricity billed.

Billing Charge: Cost of issuing bills, customer service and processing of customer payments.

Supply Charge (Supplier’s Charge): The cost of the electricity purchased for you by the utility, **calculated as a cost per kWh.**

Delivery Service Charge: The cost you pay your utility to deliver electricity to you, **calculated as a cost per kWh.**

Reliability Support Services Charge: Provides for recovery of costs the utility incurs for third-party services to ensure that local reliability needs are met. **Calculated as a cost per kWh.**

Merchant Function Charge (MFC): Administrative cost for the utility to obtain electricity supply on the customer’s behalf. May be included in the Supply Charge or the Delivery Charge. **Calculated as a cost per kWh.**

Transition Charge (Transition Adjustment): Charge or credit representing the difference between the open market cost of energy supply compared to the cost of the utility’s existing long-term electricity supply contracts. **Calculated as a cost per kWh.**

Revenue Decoupling Mechanism: Charge or credit reflecting the difference between the utility’s forecast and actual delivery service revenues. Minimizes the financial impact of reduced energy consumption as energy efficiency programs and renewable energy technologies are deployed. **Calculated as a cost per kWh .**

Systems Benefit Charge/Renewable Portfolio Standard: Recovers costs of energy efficiency programs, rebates for the purchase of high-efficiency appliances, energy assistance for low-income families, energy research and development and renewable energy incentives. **Calculated as a cost per kWh.**

Commercial and industrial building accounts may also include a **Demand Charge**, which is the utility’s cost to meet the maximum delivery requirement of a customer – the highest average kW demand measured in a 15 minute interval during the billing period. There are a number of ways to reduce your demand charge:

- Install energy efficient lighting, appliances and equipment.
- Phase-in or stagger your equipment start-up at 15-minute intervals.
- Schedule some of your energy-intensive operations for off-peak hours.
- Use battery backup power at start-up.
- Use on-site renewable energy with battery back-up at start-up.
- Use smart meters and smart controls to cycle off during utility’s peak demand times.

Your local utility has energy efficiency programs and incentives for residential and commercial customers.

NYSEG	1-800-572-1111	http://nyseg.com/Energyefficiencyprograms/default.html
Orange & Rockland	1-877-434-4100	https://www.oru.com/en/save-money/rebates-incentives-credits
Central Hudson	1-845-452-2700	https://www.cenhud.com/energyefficiency

10 Cost Saving Tips to Reduce Your Energy Use

- 1. Weatherproof your home.** Locate air leaks around windows and doors, electrical and plumbing outlets, fireplaces and chimneys, and between the foundation and frame of your house. Seal these air leaks with weather stripping, foam electrical outlet insulators and outlet plugs, caulk, window putty and door sweeps.
- 2. Get a home energy assessment.** A NYSERDA home energy assessment will identify air sealing problems that are not “do-it-yourself,” test all of your combustion appliances for safety, and provide a plan for needed improvements including access to affordable financing.
- 3. Install low-flow faucets and shower heads.** Maintain comfortable water pressure with less water use.
- 4. Get a checkup for your boiler or furnace.** Replace or clean your air filters regularly and get a professional tune-up to make sure your heating appliances are running properly. Insulate warm air heating ducts to maximize the effectiveness of your heating system.
- 5. Insulate your hot water heating tank.** Reduce hot water energy use by 10-15% by wrapping your hot water tank in an insulation blanket designed for that purpose, and insulating the first 6 feet of pipe. Be careful not to cover the thermostat or the burner compartment of a natural gas or propane heater.
- 6. Upgrade to a tankless hot water heater.** Conventional hot water tanks waste energy by keeping water hot 24/7. Tankless hot water systems heat water “on demand” and can result in energy savings of 8% to as much as 50% depending on your fuel type and the number of people in the household.
- 7. Upgrade to ENERGY STAR appliances.** When it’s time to replace an appliance, choose a new model with an ENERGY STAR rating, for energy performance, water consumption, and cost savings. There are federal and state rebates for ENERGY STAR qualifying purchases.
- 8. Wash clothes in cold water and hang them out to dry.** Save hundreds of dollars each year by washing your clothes in cold water – it’s also easier on clothing fibers.
- 9. Reduce your mowing.** Large green lawns are an American tradition, but they use a lot of energy in mowing, watering and fertilizing. Consider native plants and ground covers to reduce the areas you mow.

10. Switch to LEDs. LED lighting ranges from bright white to warm, with lumen equivalents for every household and commercial setting. LEDs use about 75% less electricity than comparable incandescent lights and last 25 times longer. LED holiday lights use 95% less electricity than conventional lights, are more durable and emit no heat. The US Department of Energy estimates that by 2027, widespread use of LEDs in the US could save about 348 terawatt hours (compared to no LED use) of electricity – the equivalent annual electrical output of 44 large electric power plants (1,000 megawatts each), for a total savings of more than \$30 billion at today's electricity prices.

Check out the US DOE Energy Saver pages at <https://energy.gov/energysaver/energy-saver> for more cost-saving tips.

3 Ways to Reduce Waste

1. Think about the life cycle of the things you buy. This way of choosing products focuses on the materials and carbon footprint of the item's manufacture, its durability and how you will use it, how you will dispose of it and whether it can be recycled or repurposed into a new product.

2. Avoid disposables whenever possible. Buy a reusable canteen or water bottle and eliminate purchases of single-serve water, Styrofoam food containers and other wasteful single-use items.

3. Compost your food and yard waste. Composting returns valuable organic material back into the soil to nurture the next generation of plants. Composting saves money by replacing chemical fertilizers and reducing the amount of waste your household sends to the landfill.

Be an Advocate in Your Community

Volunteer to serve on an energy committee to help your town or village identify energy cost savings, develop local policies that reduce waste and support renewable energy development, and provide information to your fellow residents.



