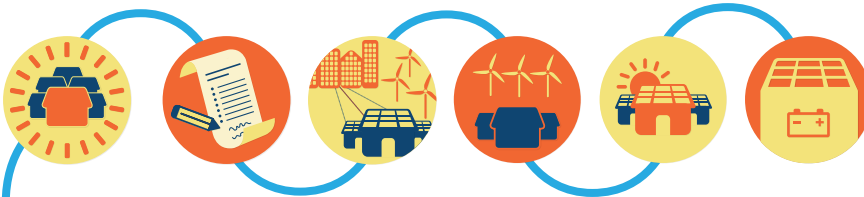


# Community EnergyVision



## An Unprecedented Opportunity to Advance Community Energy

An exciting evolution is occurring in the ways we generate and use energy, opening new opportunities for communities and neighborhoods to benefit from local, clean and efficient energy options. Energy technologies designed to be installed in our homes and neighborhoods offer the promise of putting power in the hands of consumers where they live, work and play. Community Energy offers cleaner energy and less pollution, while investing energy dollars in our towns and states and improved reliability. Community Energy investments benefit all consumers by reducing the need for more expensive energy infrastructure like long transmission lines that cost billions of dollars each year. To fulfill the promise of Community Energy, we will need to reform the way we plan and manage the energy system. If successful, cleaner and more affordable local energy can be the future for all types of communities—including those often excluded from economic progress.

[www.acadiacenter.org/document/communityenergyvision](http://www.acadiacenter.org/document/communityenergyvision)





# What is Community Energy?

## **Serving Community Needs and Offering Local Benefits**

Community Energy projects serve multiple community needs by maximizing a broad range of economic, energy, environmental, employment and public health benefits. They embrace multiple users and building types, such as small business, government and residential. Community Energy pulls a range of community residents and interests into a localized, mini-energy system and offers unprecedented opportunities to increase access to affordable, local energy, including by historically marginalized residents, and to expand job opportunities at the local level.

## **Benefitting from the Energy System's Evolution**

Utilities are in the midst of a profound paradigm shift as demand for new local technologies and state consumer and environmental goals accelerate the deployment of a cleaner, more locally distributed and more resilient energy infrastructure. Regulatory changes can enlist utilities to be partners in advancing Community Energy by removing barriers to local generation, storage, renewables and energy efficiency.

## **Promoting a Coordinated Approach**

Community Energy projects are energy systems. This means they are dynamic and interactive, employ energy management technologies, incorporate demand-side technologies—like energy efficient lighting and heating—and supply-side technologies—like local wind and solar farms. Community Energy can aggregate energy use by neighbors and operate independently of the larger grid. Properly planned and designed, Community Energy systems are more resilient than traditional grid power and take advantage of system efficiencies to offer smarter, more flexible and more affordable power.

## **Offering Greater Local Decision Making and Control**

Communities can drive the planning, design, siting, development and operation of local projects. Aligning state and local rules will empower communities to take full advantage of local energy opportunities and tailor them to their unique needs. Many states already have aspects of Community Energy approaches in place that can be expanded to embrace the larger opportunities that now exist, such as Energy Improvement Districts in Connecticut and New York Prize Opportunity Zones.



# Community Energy is Emerging in the U.S. and Abroad

Community Energy systems are emerging where interest is driving the creation of local energy systems and leading to needed policy reform. The following examples share many attributes: they develop local energy options to improve reliability and resiliency; they provide and benefit from a broad array of local technologies including renewable energy, electric vehicles, high efficiency heat pumps, energy management and energy efficiency; and they involve many facets of their communities in sharing benefits.

## Wildpoldsried, Germany

In 1997, Wildpoldsried decided to revitalize the community by pursuing growth through renewable energy generation. The town now operates 5 biogas plants, almost 5 MW of solar PV, 11 wind turbines with a capacity of 12 MW, a biomass district heating network, three small hydro power plants and 2,100 square meters of solar thermal systems. All public buildings plus 120 homes and 4 companies are connected to the district heating system; 200 residences and 9 municipal buildings have solar PV systems. The town generates 500% more energy than it needs and sells the excess power back to the grid under a power agreement worth \$7 million annually. In 2010, battery storage and communication and monitoring technologies were installed to balance the large increase in renewable generation supply and keep the grid stable. Wildpoldsried has leased 32 electric vehicles to residents to store excess energy; during an energy surplus, the vehicles are given charging priority but return power to the grid if there is a shortage.

## EcoGrid EU - Bornholm Island, Denmark

The Danish island of Bornholm seeks to be 100% fossil free by 2025. The EcoGrid EU pilot on Bornholm is demonstrating that information and communication technology, innovative market structures and community participation can enable the operation of a power system with more than 50% renewable energy sources, such as wind, biomass and solar. The core activity of EcoGrid EU is to make homes “smart” using low carbon electricity for heat, hot water and electric vehicle charging. Østkraft, the electric utility, enrolled 2,000 island residents in a program enabled by advanced metering that automatically controls participants’ heat pumps and hot water heaters, operating those appliances when there is an overabundance of wind energy and storing hot water for use during less windy hours. If successful, this model can be scaled up to help Denmark achieve its 2050 ban on fossil fuel heating.

## Rutland, Vermont

City leaders and Green Mountain Power (GMP) are working together to establish Rutland as the “Energy City of the Future”—the first municipality in the country to combine solar, storage and microgrid technology to improve community resiliency. According to GMP, 80% of the utility’s customers cannot install solar due to roof limits, renting rather than owning their home or lack of upfront capital. The Rutland pilot addresses these limitations by using innovative community models that open the door to solar for a wide variety of residents and businesses often left out of the solar market.

**Community Solar Farm** - The Stafford Hill Solar Farm at the closed Rutland City landfill is the first solar + storage project in the country to repurpose brownfield land into a renewable energy site. 7,700 solar panels generate 2 MW of electricity – enough to power 365 homes; 4 MW of battery storage capacity allow an entire circuit to be disconnected from the grid in a power emergency.

**Customer Solar Leasing** - Rutland partnered with NRG and GMP to build a 150 kW community solar array and offer a central solar lease program. 50 customers who signed on do not pay any upfront costs but receive credit on their electricity bill for power produced by the array and are expected to save money on their electric bills.

## Boothbay Harbor, Maine

Boothbay Harbor is a small community located 11 miles down a peninsula in coastal Maine. Facing concerns over power reliability during the summer when seasonal tourism places high loads on the electric system, a local energy pilot project has installed a range of energy resources in the town, from photovoltaic panels on the transfer station, fire department and town garage, to targeted energy efficiency measures like LED lights, three trailers of industrial size batteries for energy storage and back-up local generator sets. Results show that local energy resources are meeting the reliability need—at a cost of \$6 million, 1/3 of the \$18 million estimated cost of expanding distribution lines. And the transfer station reports that its monthly electric bill has fallen dramatically—from \$800-\$1400 per month to \$80-\$100 per month.

## Boulder, Colorado

Boulder has chosen to end a 20 year agreement with the large electric power company, Xcel Energy, and instead, as provided by Colorado law, turn to municipal electric utility ownership. Spurred by interest in ramping up renewable power, city referenda formed a municipal electric company and authorized bonds to purchase the utility’s distribution assets from Xcel. The city expects to increase the percent of clean energy powering the community at rates no greater than those offered by Xcel, while keeping millions of dollars in ratepayer funds in the local community.

## Sustainable Westchester, New York

Sustainable Westchester, a group of energy advocates, residents, and municipal leaders, petitioned the New York Public Service Commission to allow a Community Choice Aggregation (CCA) program in Westchester County, which is served by Con Edison. CCA enables municipalities, either by referendum or legislation, to determine their electricity mix and sources. CCA gives residents and small businesses a level of clout to negotiate competitive prices from independent energy suppliers. CCA could mark a significant change in how communities make decisions about their power sources. Towns can choose to buy from energy suppliers with an eye toward price, clean power, or both. Residents also have the ability to opt-out and continue buying energy supply through the utility.



# Advancing Community Energy: Four Areas Where Reform is Needed Now

Reforms are needed at the state and municipal level that allow states, cities, neighborhoods and energy planners to develop Community Energy projects. Existing legal and financial barriers need to be removed and positive approaches to facilitate decentralized Community Energy systems need to be encouraged. Four areas in need of reform include:

## 1 Advancing Community Engagement

New approaches are needed to empower communities to reap the benefits of local energy.

**Local Planning** – Zoning and outdated building codes can stifle Community Energy. Higher-density development could be allowed in exchange for incorporating local generation into new buildings/neighborhoods. Community concerns can be addressed by directing larger projects to less productive land using energy mapping tools. Building codes should be updated to enable Community Energy by requiring, for example, pre-wiring new construction for solar PV or requiring district energy hookups within established zones.

**Facilitate Equal Access** – Communities have different levels of resources to pursue Community Energy. Ensuring equal access may require targeting priority constituencies who need additional support. Approaches developed to ensure fair access to energy efficiency or distributed solar programs should be expanded to communities (including non-homeowners) and technical support provided.

**Energy Democracy** – Consumer technologies can empower communities and energy decision-making and energy resource ownership. Mechanisms to allow greater consumer and community control are available and should be considered.  
(See <http://www.communityempowerment.org/how-ce-will-work/>)

## 2 Updating the Rules that Govern the Energy System

Regulations designed for a system of power flowing from power plants to passive consumers are being upended by policy and technology innovation. Existing rules for the power system need to evolve as well: the current rules are a poor match for technologies that enable consumers to contribute to the operation of the grid. The system is shifting toward consumers and communities, leaving legacy regulatory approaches in need of reform.

**Adopt Pro-Customer Incentives** – Financial incentives are powerful decision drivers but the current utility incentive structure drives outcomes that are not good for customers or communities. Incentives designed for an outdated one-way grid favor large, expensive projects over lower cost, local solutions, and inflexible utility rates perpetuate outdated approaches, while stifling consumer choice. As long as utilities earn money on building infrastructure (like wires, poles and substations), they will undervalue distributed, customer-sited resources that often are a fraction of the cost. Utilities typically receive a 5% incentive for achieving energy savings, compared with over 10.5% for transmission.

**Adopt Rates that Help Customers** – Electric rates have a powerful influence on consumers. Higher fixed charges reduce consumer control over energy bills and undermine energy efficiency and local generation. Rates that reflect underlying costs can reduce demand and encourage consumers and communities to optimize existing energy infrastructure.

## EMPOWERING THE MODERN ENERGY CONSUMER: CONSUMER SAFETY NET



**Make Unequal Cost Sharing Fair** – Grid planning rules disadvantage Community Energy solutions by requiring communities to bear the full costs of clean energy resources. Distribution costs are paid for by ratepayers in the utility service territory and transmission costs by everyone in the transmission grid, but the cost of clean, local energy resources are borne entirely at the local level. These differences encourage building expensive infrastructure rather than the best solutions. Planning rules and utility incentives should be revised to prioritize local energy resources and Community Energy.

**Adjust Monopoly Control** – Utilities have been given exclusive control over the grid. Monopoly control made sense in the past. Now customers and communities can be energy producers, and limits on their ability to choose energy options create lost opportunities. Consumers deserve fair access to the grid.

**Remove Limits on Customer Generation** – Limits on the power that Community Energy projects can feed into the grid have been justified on safety and economic grounds but in practice lead to artificial restraints on who receives fair compensation for powering the grid. These limits need to be removed.



### 3 Integrating Community Energy Technologies: Equal Planning, Financing and Interconnections

Integrating new energy technologies into the grid is needed to facilitate the promise of local energy resources. Two way power flows—from the consumer to the grid and vice versa—can be accommodated with system upgrades and planning approaches that anticipate uptake of new technologies. The telecommunications system has been remade over a few decades—the energy system must now do the same.

#### **Reform Energy System Planning Approaches to Encourage New Technologies –**

Local renewables, energy storage and electric vehicles offer significant benefits to the electric grid. Generation from community sources replaces generation from power plants and defers costly upgrades, while energy storage and electric vehicles can reduce expensive peak payments. Microgrids and community energy benefit the grid by providing congestion relief and improved reliability. The planning rules that govern the system need to reflect this new world.

### YOUR COMMUNITY ENERGY FUTURE





**Fairly Value Local Energy Projects** – Distributed Energy Resources (DER) like solar PV systems provide unique value to the electric grid by reducing energy demand, providing power during expensive peak demand times and avoiding unneeded generating plants. The level of compensation received by consumers and communities for DER should reflect the value these resources provide to the grid.

**Remove Interconnection Barriers** – Interconnecting local energy should be straightforward. Streamlining and automating the interconnection process will reduce the time it takes to connect projects and make the process more transparent, accessible and economic.

**Provide Adequate Access to Capital** – Financing can be a significant hurdle for Community Energy projects. Project funding may be available from a variety of sources, including public funding, ratepayer funding, financing products, and private investment. The impact of this potential barrier should be considered in discussions regarding funding mechanisms for local clean energy projects.

## 4 Providing Consumers with the Information They Deserve

Customers are offered little insight into energy usage beyond monthly energy bills that are often difficult to decipher. Smart customer choices and community control depend on access to information about energy options. Better bill designs, easier access to information that can be facilitated by “smart meters” and smarter usage of existing meters could afford consumers clearer understanding of which opportunities they can pursue.

**Customer Data** – Customers must own their own energy usage data with the detail they desire.

**Access to Information** – With proper consumer protections, customer data should be made available to third parties who can propose Community Energy projects. As the range of viable energy management technologies expands, broader access to system information can ensure more thorough consideration of potential solutions and enable approaches that deliver greater benefits to consumers and communities and optimize the energy system.



# The Changing Energy Landscape Favors Consumers and Communities

The electric power industry began with municipal electric light districts which were consolidated in favor of building large central station power plants that delivered electricity through long transmission lines owned and operated by utilities. The primary energy fuel for these plants—coal, oil and natural gas—typically originated in other regions and countries. Today, with a wide array of energy technologies available from small-scale clean energy generation like rooftop solar to energy efficiency management tools, opportunities once again focus on our communities.

With appropriate updated reforms to our decades old energy system rules, a Community Energy future will flourish, and you as a consumer play a critical role in helping to make it a reality. Acadia Center invites you to contact us at [info@acadiacenter.org](mailto:info@acadiacenter.org) to learn more about exciting opportunities and join us to advance key changes to how the energy system is currently planned and managed.

*Acadia Center is a non-profit, research and advocacy organization committed to advancing the clean energy future. Acadia Center is at the forefront of efforts to build clean, low-carbon and consumer-friendly economies. Acadia Center's approach is characterized by reliable information, comprehensive advocacy and problem-solving through innovation and collaboration. Community EnergyVision was produced by Acadia Center staff. Thanks to Public Displays of Affection for visualizations and design.*

[acadiacenter.org](http://acadiacenter.org) • [info@acadiacenter.org](mailto:info@acadiacenter.org)

**Boston, MA** 617-742-0054 • **Hartford, CT** 860-246-7121  
**New York, NY** 212-256-1535 **Providence, RI** 401-276-0600  
**Rockport, ME** 207-236-6470 • **Ottawa, ON, Canada** 613-667-3102



Copyright © 2015 by Acadia Center All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, without the prior written permission of the publisher, except in the case of brief quotations embodied in critical reviews and certain other noncommercial uses permitted by copyright law.