Final Report:

Recommendations for Community-Based Energy Program Strategies

APPENDICIES

June 1, 2005

Recommendations for Community-Based Energy Program Strategies

APPENDICES

Appendix A: Program Concepts

Light-Touch

Purpose
Secure high community participation and high visibility at a low cost. Possible first step to other efforts.

Description
Designed around the Poultney, Vermont model, this program approach focusing on a single measure, CFLs, and attempts to reach every household and business in a rural community. It works with local suppliers to change the lighting available in rural, independent and/or regional retailers. It works with the schools to achieve a broad reach throughout the community, and to sustain the energy education lessons.

Marketing materials, communications strategies, educational materials, etc. can all be designed one time, and used in multiple communities. Other retrofit programs can be marketed in conjunction with this approach, but would operate based on existing protocols.

Options
- Poultney operated as a "challenge"; what's that mean for Oregon?
- Are there any important partners in Oregon, e.g. school teacher associations?
- This could be combined with appliance pick-up or turn-in events, such as torchieres, room air conditioners, and second refrigerators.
- Depending on the local retail mix, there could be a heavy ENERGY STAR product promotion that operates in conjunction with this effort.
- The Light Touch concept could be used as an introduction to neo-energy efficiency and the Energy Trust across a couple of sectors, and could be parlayed into a "next phase" community effort. Basically, you would use Light Touch to increase awareness and pre-market and pre-subscribe to other program participation and/or community concepts such as Energy Expresso, Energy Star Communities, etc. The Trust could use the level of pre-subscription/interest to establish the timing/priority of a next phase in various Light Touch communities.

Reference Projects
The Poultney Change A Light Challenge

Efficiency Expresso

Purpose
A concentrated effort to provide services to hard to reach communities.

Description
Many smaller communities and businesses are beyond the reach of typical marketing efforts. It may be more efficient to provide a concerted focus on these communities, with the goal of increasing home and small business retrofits, and perhaps recruiting local businesses to provide more energy efficiency products.

To use community marketing dynamics, the programs would first retrofit a few houses or businesses, then contract with a local resident to market Energy Trust programs throughout the community. After the recruitment of a sufficient number of projects, Energy Trust contractors would come to the town (or neighborhood) for several days to provide services. A follow-up visit may need to be scheduled 6 months later as additional residents and businesses decide to take advantage of the services. Incentives may need to augmented or supplemented with loans to resolve financial barriers within the specified time period. In any case, the efforts to get efficiency in this community are concentrated into a brief period of time to reach underserved customers and reduce costs of serving relatively remote communities or other hard to reach populations.

Options
Measure package can be customized (e.g. appliance turn-in), but generally relies on existing program delivery mechanisms.

Reference Projects
Neighborhood Power Project
New London Resource Project
David Energy Efficiency Project

Renewables Plus

Purpose
This concept focuses around a community scale renewables project, and uses the community interest generated by that project as a marketing and educational tool for other energy efficiency efforts.

Description
The renewables project is the lead effort in this concept, which combines community scale wind with broad and deep energy efficiency strategies. At the appropriate stage(s) of project development, the Energy Trust brings in additional strategies including: working with local media to generate press stories, providing educational materials related to the project to local schools, sponsoring an event that community members can participate in easily (such as CFL distribution), and a concerted marketing effort of other Energy Trust product support and retrofit programs.

An initial solicitation would be used for communities to express their interest. A limited number of communities, perhaps three to five, would be selected for more detailed investigation, including a review of the local wind regime and assessment of other local barriers and opportunities. A small pv array could also be placed on a school or public building at this time, and a local public relations effort would be supported.

Assuming adequate wind, community interest and financial resources, one or more communities would proceed to the second stage of the project, consisting of construction of a wind power plant and a concerted effort to reduce the electric use of the community. The Energy Trust would assign a point person to the community to work with a local organizing committee and coordinate Energy Trust and ODOE resources.

Options
- This could be the beginning of a "sustainable community" approach, but other themes (energy independence, local economic development) may resonate better with the community. Themes could be customized depending on community interest.
- The Oregon Downtown Development Association is a potential partner on the initial community marketing and mobilization.
- Many elements of this approach could be used where T&D issues are a concern.
- This approach could be used with other community energy resources – e.g. landfill methane, biomass, and geothermal.

Reference Projects
Solar Bonds
Community Wind/Efficiency Programs

Oregon Star Communities

Purpose
Support development of a local infrastructure that can leverage existing community interest and resources.

Description
In this concept, the Trust would issue and promote an RFP to communities that would compete for focused project funding. As part of the proposal process, communities would propose; 1) How they would coordinate with Energy Trust goals and programs, 2) What particular other energy opportunities they would like to focus on, and 3) What additional resources the community would bring to the project. Using criteria such as innovative marketing and delivery mechanisms, organizational cooperation, financial leveraging, and pre-subscription to Trust programs, communities would be selected and/or prioritized for implementation of a community project.

This concept folds energy efficiency into other, higher priority community projects such as urban redevelopment, local housing needs, and achievement of broader environmental goals. Additionally, it should support enhanced local marketing of Energy Trust programs and could serve as a test bed for new program concepts. Because the priorities are set by the community, this concept leverages existing community interest and locally controlled financial resources. The local base could be a part of local government or a local non-profit or association.

Options
The Energy Trust funding could be limited to two or three years for a given project, with the expectation that some communities would continue for a much longer period of time with an enhanced focus on energy issues. A goal would be for the community to secure continued funding for some aspects of the infrastructure created through this process. Longer-term results might include:

- Securing community support for large-scale demonstration projects on government buildings or schools.
- Influence on major development master planning that may occur in the local jurisdiction; such as colleges and universities, hospitals, major housing developments, and urban redevelopment projects.

Reference Projects
Peterborough Green Up: Ontario Green Communities Projects
Neighborhood Power Project

Back My Piggy

Purpose
Leverage the existing resources and local connections of a "host" entity as a relatively easy way to access community leaders and community marketing dynamics.

Description
This concept is based on the Oregon Downtown Development Association (ODDA) project (and to some degree the Seattle Neighborhood Power project) where a separate organization provides the entry into the community, and energy efficiency is added to the local agenda.

In this concept, an Energy Trust point person would work with selected local communities already working with the host organization to examine opportunities for substantial energy efficiency efforts. In the case of the ODDA project, the emphasis would be on small businesses, local government projects, and possible community scale renewable energy projects.

After facilitating some type of initial assessment and utilizing community marketing dynamics to increase awareness of program resources, the Energy Trust staff would facilitate access to Energy Trust and ODOE programs for smaller projects, and financing for major projects. This "Community Energy Advisor" would bring a level of access to resources that the community would likely not find on its own, but relies on another organization to bring credibility and easy access to community leaders, thereby reducing the initial organization efforts substantially.

Options
- There may be simple strategies for expanding the scope of these projects to reach other community members and/or provide additional services. For example, appliance pick-up or turn-in could be added, or community events focused on residential efficiency could be added.
- A related type of effort could be used in conjunction with urban neighborhood associations. This effort would focus on small business and ethnic and/or lower income residents where additional marketing may be needed to secure their interest in services.

Reference Projects
ODDA Resource Teams Plus Energy
Neighborhood Power Project

Transmission and Distribution Dynamics (TeDDy)

Purpose
Use energy efficiency and demand reduction as a carefully focused, community-based alternative to T&D expansion.

Description
When facing a major capital upgrade, community-based marketing has been demonstrated to be a realistic alternative. The "community" defined by T&D issues is likely different than a community described by political boundaries. Nevertheless, the focused strategies of community marketing can deliver substantial demand and energy savings within a relatively short time period.

There are several key differences to standard efficiency programs to be considered in the early planning stages of a T&D related project. First, what measures (or actions) directly focus on relieving the particular constraint. These will primarily be related to the impact on the load curve, e.g. residential winter space heating measures versus summer air conditioning peak. Second, the avoided costs may be much higher because of the capital costs of the required upgrades, so efficiency strategies can go deeper. Third, can price signals be used with customers to change energy use patterns in a long lasting way.

Options
- Depending on the timing of the peak demand, there may be renewable energy options that could be critical parts of the mix of efforts.
- The measure mix and strategies could be very different than current Trust programs.

Reference Projects
Community Energy Cooperative
Jasper Energy Efficiency Project
Hood River

Program Concept Attribute Matrix

	Equity	Leverage	Cost-Effective	Enviro	Public Relations	Capability Building	T&D
Light - Touch	√		√		√√		
Efficiency Expresso	√√√		Relative to equity		√		√
Energy Independence		√	Relative to T&D	√	√√	√	√√
Renewables Plus		√	√	√	√	√	√
Energy Star Communities		√√	Long-term?	√√	√	√√√	
Back My Piggy	√√	√√	Relative to equity		√	√	

√ Strategy has this attribute generally
√√ This is a major attribute of the strategy
√√√ Dominant reason to consider this strategy

Appendix B: Program Review Summaries

Community-Based Energy Project Matrix

Project Name	Target Markets	Other Goals	Key Benefits	Relative Cost Effectiveness	Relevance to Energy Trust	Related Concepts
Neighborhood Power	Ethnic Residential Small Business	Community issues, hard to reach customers, public relations	Provides deep outreach within urban communities. Replicable model.	Less cost-effective. Substantial overhead and slightly higher incentives.	Relevant only for the inclusion of hard to reach customers. Otherwise, may not be a useful model.	Efficiency Expresso, Oregon Star Communities
New London	Small community. Residential and commercial	Community involvement and participation	Replicable model.	Cost effective. Relies on loans more than rebates; done in a location where rebates were not available	Some relevance. Project rebalances marketing and incentive dollars. Many good community marketing ideas.	Efficiency Expresso
Jasper	Community wide. Multiple technologies and markets	Conservation rather than new power plant.	Demonstrated benefits of community efforts. Efficiency successful and cost-effective strategy.	Less cost-effective than existing program mix. However, approach is cost-effective relative to capital projects	Directly relevant only for areas with T&D constraints. Focused effort within geographical constraints.	TeDDy
Poultney	Small community. Single measure (CFLS) to residential and business.	Reach all members of community.	Reached high percentage of customers. Engaged local community. Residual impacts?	Much less cost-effective as implemented. Higher marketing and incentive costs.	Directly relevant. Simple, replicable approach to community engagement. Could be cost-effective, but is it better than Trust's current strategy? Are CFLs saturated?	Light Touch
Green Communities	Typically residential	Community environmental issues	Lasting community infrastructures. Addresses multiple needs. Attracts additional funding.	Likely less cost-effective. Mobilizes multiple resources, but has costs of community infrastructure	Somewhat relevant. Demonstrates long-term benefits of establishing local infrastructure. Adds new resources.	Oregon Star Communities

Oregon Downtown Development	Rural small business and government	Economic development, downtown infrastructure	Community scale projects. Retail enhancement. Hard to reach markets.	Less cost-effective. Limited savings	Relevant, although approach would need to be expanded to meet efficiency targets. Match with renewables strategies?	Back My Piggy
Osage	Community wide	Infrastructure change	Energy and community impacts.	Very cost effective.	Not relevant. Structural differences in organizations severely limit usefulness	
Community Energy Cooperative	Community wide	Demand reduction, neighborhood empowerment.	Demonstrated demand reduction. Transparent prices	Unclear. Focus on demand.	Relevant to T&D issues. Different structural model but useful strategies. Demand not a driving issue, yet.	TeDDy
Davis	Community wide	Alternative to utility programs. Expanded effort to small business.	Reasonable cross-the-board success	Less cost effective. Similar incentives, more marketing and education	Generally not relevant. Similar to Trust, but on county scale. Focus on hard to reach customers useful.	Efficiency Expresso
Solar Bonds	Funding for community scale projects.	Using renewables and efficiency together.	Demonstrated PR value, but no projects yet.	Adds resources. Cost-effectiveness unclear.	Relevant for larger community scale projects. A strategy for cities to raise matching funds.	Renewables Plus, Oregon Star Communities
Hood River	Community wide	Demonstrate breadth and depth of conservation programs	High participation and savings.	Less cost-effective. Included marginal measures and higher incentives.	Directly relevant only for areas with T&D constraints. Focused effort within geographical constraints.	TeDDy, Efficiency Expresso
Green Power Match	Community projects and low income	Build benefits from green power purchases	Results not available. Could enhance green power marketing.	Difficult to compare.	Relevance unclear. Depends on Trust goals.	
Community Wind	Combines wind and efficiency to improve economics.	Create revenue source.	Not demonstrated.	Adds resources. Cost-effectiveness could be similar.	Appears to be relevant, although only a concept at this point.	Renewables Plus, Oregon Star Communities

Neighborhood Power Project

Seattle City Light
Seattle, Washington

Description
This program is a series of annual, neighborhood-based projects that target residential and small commercial energy efficiency in conjunction with other neighborhood issues.

Purpose
The primary goal of the Neighborhood Power Project is to capture energy and resource efficiency in urban, hard-to-reach neighborhoods.

Scope / Scale
The neighborhood selected is typically between 8,000 to 12,000 addresses. Each project operates for one year, including initial planning and organizing functions. Projects encompass small business, multi-family, and single family residences. Program costs are about $200,000 plus incentives.

Key Results
Over the last 4 years, annual energy savings have averaged about 1,100,000 kWhs per neighborhood project. Slightly more than half of the savings come from the Smart Business program, with the remainder coming from the residential sector

Success Factors
- Consistent support from SCL.
- Repeatable, multi-year strategy.
- Working with established neighborhood organizations.
- Integration of multiple program elements.

Lessons Learned
This is an excellent community relations effort that focuses on hard to reach residential consumers and small business.

The Neighborhood Power Project demonstrates a fairly simple and very repeatable organizational framework. While the project listens closely to community needs, it still achieves energy efficiency with a straightforward approach that can add or subtract program elements as they are available or needed.

New London Resource Project

New London Utilities and Wisconsin Gas Company
New London, Wisconsin

Description
A multi-utility supported demand-side management pilot program designed to demonstrate the energy and cost saving benefits of substantial community involvement.

Purpose
The New London Resource Project (NLRP) was designed to demonstrate that substantial community involvement would produce more long-term conservation at a lower cost than traditional demand-side programs. Key goals of the NLRP included:

- Emphasize community involvement and ownership in the project;
- Incorporate unique marketing and program strategies;
- Use positive cash-flow financing as an alternative to rebates; and,
- Develop a community infrastructure to enhance persistence.

Scope / Scale
New London has a population of 6,750. The project operated from 1992 through 1995. The budget was set at 2-3% of New London Utilities annual revenues, totaling approximately $550,000 over the life of the project. The NRLP had an extensive array of program initiatives for residential, commercial, and industrial customers.

Key Results

- Residential and commercial financing on the utility bill totaled $600,000;
- Annual savings was 3 million kWh, over 125,000 therms, and 0.75 MW demand reduction.
- About 750 homes (25% of residential customers) and 75 businesses had audits

Success Factors / Lessons Learned

- Project duration allowed for energy education to influence customers and provided a consistent long-term platform for action.
- Positive cash-flow financing on the utility bill eliminated the barrier of lack of capital access.
- Community involvement and ownership is important to the success of a community energy efficiency project.
- A project champion is needed to bring credibility and vision.
- A multifaceted community marketing campaign reaches customers in many different ways.

Jasper Energy Efficiency Project

Alberta Power
Jasper, Alberta, Canada

Description
A single community project focused on substantial demand reduction as an alternative to grid or generation capacity expansion.

Purpose
Three options were considered to meet electric demand.

- Build a transmission line to Jasper at a cost of $8.4 million dollars;
- Expand the generating capability - $2.45 million for 2.8 MW; and
- Reduce demand through energy efficiency.

Alberta Power decided to target a 2 MW reduction in demand (20%) with 500 kW from the residential sector and 1,500 kW in the commercial sector.

Scale / Scope
Jasper is a community of 4,500 residents. The Jasper Energy Efficiency Project (JEEP) began in 1991 and was completed in 1994. Funding for the project totaled $1,680,000. Program efforts were confined to capturing cost-effective savings in the residential and commercial sectors. An economic analysis indicated a potential demand reduction of 2.995 MW and close to 7.8 million kWh savings.

Results

- JEEP program goal of 2 MW peak capacity savings was exceeded by .11 MW
- 891 of 1,296 households participated in JEEP (69%)
- 110 of 210 businesses installed recommended measures (52%)
- The cost/kW of the residential program was $626/kW and the commercial $487/kW; compared to a capital cost of $980/kW for a new generating unit

Success Factors / Lessons Learned

- JEEP showed that a targeted "resource acquisition" strategy can be successful with focused goals, a simple implementation plan, and a mobilized community.
- Establishing a Public Information Committee and hiring local people as JEEP Team and suppliers gave the project credibility and momentum. A strong educational component helped community residents understand the project.
- Many JEEP participants installed efficiency measures beyond those targeted by the program and non-participants installed measures.
- Projects can ramp-up quickly and be successful if the entity mobilizing the community is credible, goals and objectives are articulated to the community, and community residents are educated about the overall project.
- Administrative, education, and marketing costs of community energy efficiency projects can be high. However, these costs can be justified in order to ensure a community-wide effort that results in high participation rates and meets stated goals and objectives.

The Poultney Change A Light Challenge

Efficiency Vermont
Poultney, Vermont

Description
The challenge focused on a single village, a limited period of time (one month), and one measure that every household and business could easily complete - replacing at least one incandescent light bulb with an energy efficient bulb.

Purpose
Education, town, and business leaders in the village of Poultney, Vermont were interested in implementing a participatory campaign to demonstrate the positive impact each individual can have on energy use and the environment.

Scale / Scope
The village of Poultney has a population of 1750 in 493 households. The challenge ran from October 4 to October 26, 2003. Pre-campaign planning, marketing, and public relations occurred from August through November 2003. The total estimated costs for the Change A Light Challenge are roughly $86,000. (A subsequent event in a second community achieved larger savings at a significantly lower cost of $35,000.) Each household and business was asked to replace at least one incandescent light bulb with an ENERGY STAR® qualified compact fluorescent bulb.

Results
Virtually all (over 96%) of the community participated by replacing at least one incandescent bulb. For each free bulb that was picked up at the village hardware store, more than three additional bulbs were purchased for a total of 3,284 bulbs. Media coverage brought information about this event throughout the state resulting in greater knowledge and increased purchases of energy-efficient lighting, as well as interest in replicating this event in other Vermont towns.

Success Factors / Lessons Learned

- Buy in and support from more than one community partner appears to be a critical factor to the success of these events. Identify an early "keystone" partner.
- Involvement of students at all education levels extended the project's reach into the community.
- The project defined and set an achievable challenge goal with a short time horizon (two to three days).
- Piggyback with a central community event that draws strong community participation.

Peterborough Green Up

Ontario Green Communities
Peterborough, Ontario

Description
One of 25 similar non-profit projects in towns and cities in Ontario that feature energy efficiency as part of a larger effort to reduce waste and improve the local environment.

Purpose
Although the initial emphasis was on promoting energy efficiency, the mission includes a variety of environmental objectives including water efficiency, waste reduction, reduction in pesticide use, shoreline rehabilitation, tree planting, ground water protection, sustainable transportation, and – in one town (Toronto) – renewable energy.

Scale / Scope
Green Communities organizations currently exist in a wide range of towns – from populations in the tens of thousands to a city (Toronto) of several million. Peterborough Green Up serves a town of about 70,000 people with a staff of 14, five of them devoted to the energy program. The principal focus of the initiative overall is the residential sector, the primary emphasis to promote energy efficiency is home assessments and promoting improvements to the thermal envelope and HVAC system.

Results
Approximately 25% of the housing stock received home energy assessments. Between 40% and 50% of all homes visited are following up on recommendations for major efficiency measures. Those that follow up are projected to realize an average of 30% to 35% reduction in space heating energy use.

Success Factors / Lessons Learned

- Green Communities is a social movement of sorts, with very long term goals that require a sustained effort for a decade or more. As such, the creation of local non-profit organizations intimately familiar with their community is critical.
- Once a committed group of local volunteers is established, seed funding is important to help develop an organizational structure.
- Once formed, those organizations will survive without general funding only if they are successful in developing partnerships with their town government and a wide range of other organizations (from which funding can be obtained).
- Once several successful community efforts are launched, there is a "snowball effect" in which efforts in other communities are spawned. This is made easier if the communities are organized to facilitate information sharing regarding challenges and successes.

ODDA Resource Teams Plus Energy

Oregon Downtown Development Association / BetterBricks
Multiple Projects in Rural Oregon

Description
This program is a series of pilot efforts to integrate energy efficiency into short-term, focused community efforts to revitalize rural business districts.

Purpose
The Oregon Downtown Development Association (ODDA) assists communities in developing local leadership and capacity to manage and fund a comprehensive downtown revitalization program. The goal of the resource team process is to engage a community, determine community capacity, and assist in defining a future vision for their downtown. For a series of projects, an energy expert was added to the team to review energy savings opportunities at both the macro level (community) and micro level (individual businesses) to determine how energy efficiency and renewable energy development might impact the economic health of the community.

Scale / Scope
The communities served range from towns of less than 1,000 residents to small cities such as Astoria and Klamath Falls. The focus is the downtown business district, but also includes surrounding community space and buildings. The resource team visit is only two to three days, but follow-up activities may take years. Projects encompass small businesses, government buildings, public space, and community infrastructure.

Results
Most small businesses and government buildings reviewed in the program had lighting savings potential of between 30% and 70%. Fewer than 50% of the businesses that received lighting recommendations have implemented them. Several community scale projects received a boost from the ODDA efforts and moved forward. These include a methane digester in Tillamook and the conversion of a school in Fossil to a daylighted, naturally ventilated paleontology center.

Success Factors / Lessons Learned

- Linking with ODDA (or similar organizations) is an excellent way to gain access to business and community leaders.
- Typically, small businesses have neither the interest nor the resources to undertake energy efficiency retrofits. In this project, interest was not a problem due to the linkage to business development, but money was still an issue.
- Local electricians are not interested in a sudden “burst” of work.
- Many rural communities have some type of local energy resource that could be developed. There is not a system for bringing these resources on-line.
- Linking to business and economic development is an excellent way to secure community leadership interest in energy efficiency and renewable energy.

Comprehensive Demand-Side Management Program

Osage Municipal Utility
Osage, Iowa

Description
This program is a long-term, low-cost municipal utility effort that ingrained energy efficiency into a community, and realized major economic benefits.

Purpose
The program was a response to rising oil prices in 1974 and concerns that availability and price volatility could impact customers' rates. In addition, utility customer demand was growing at a rate of 7.2% per year in 1973, which would require investing in new generating capacity. The management of the utility decided that the best strategy to address these issues was a comprehensive demand-side management program.

Scale / Scope
Osage is a small city in Iowa, population 3,500. The utility provides electric and gas services to residences and businesses. The demand-side management program operated for over 18 years, from 1974 through 1992. Total expenditures were less than $500,000.

Results
- Since 1983, electric rates for OMU customers have decreased 19%. Average electric bills in Osage were 58% lower than rates of Iowa's investor-owned utilities.
- Estimates of overall average savings for electric and gas are 25%; saving the community $1,000,000 per year.
- Peak demand growth has been held to less than 3% per year since 1976, which delayed the need for new capacity until after 2000. Deferring construction of new capacity saved OMU $200,000 per year.
- Economic development – four plant expansions and a new plant were built in Osage since the early 1980s, partly due to low electric rates and an active and productive community.

Success Factors / Lessons Learned
- Community energy efficiency education for the first two program years created long-term benefits for the community; education was largely responsible for community support and DSM program success**.**
- Long-term and well conceived demand-side management can be an asset to a utility in managing supply and maintaining the financial health of the community.
- DSM is larger than energy and dollar savings; added benefits include job creation, economic development, and environmental stewardship
- Osage proved that communities and their residents and businesses are willing to adopt DSM as a core value of their utility and community, when benefits are real and visible over a period of time

Community Energy Cooperative

Center for Neighborhood Technology & Commonwealth Edison
Chicago, Illinois

Description
An urban model of neighborhood empowerment to respond to new energy markets, with an emphasis on demand reduction.

Purpose
The Cooperative was initially formed to promote community development by:

- Improving neighborhood electrical reliability;
- Reducing costs of energy services; and
- Permitting community participation in the new markets created by restructuring.

The Cooperative's work has changed in response to the market. Its main project now is exploring how to create demand response through a real time pricing program.

Scope / Scale
The Cooperative is focusing its work in four communities ranging from 8,000 to 70,000 households. The Cooperative launched in January 2000 and is still operating. The Cooperative received start-up funding from Commonwealth Edison in the amount of $14.7 million over five years. In addition, the Cooperative received a negawatt payment of $150/kW for its demand reduction programs in 2000 and 2001.

Results
The Cooperative reduced peak energy demand via numerous efficiency incentive programs. First year load reduction programs reduced electric demand by more than 6 MWs. Larger members voluntarily curtailed almost 17 MWs of power on demand.

Success Factors / Lessons Learned

- Both households and businesses in a community can achieve real reductions in demand through energy efficiency and curtailment programs. These reductions can be targeted to reduce the cost of energy infrastructure needs.
- A Negawatt payment can be an important source of revenue for community energy programs, but determining the proper size of such a payment can be very difficult.
- Partnership can bring vital resources and new networks to energy programs.
- Different communities require different organizing strategies.
- Energy market transparency is required to identify the true value of efficiency, demand reduction, on site generation, and other energy alternatives.
- A Community Benefits Fund created from energy savings offers a motivation for efficiency and demand reduction aside from environmental or energy bill benefits.

Davis Energy Efficiency Project

Davis Energy Task Force
Davis, California

Description
A non-utility operated DSM program developed to provide better service to hard-to-reach populations such as small businesses and rental properties.

Purpose
In response to the California energy crisis, the City Council of Davis, California resolved in 2001 to explore opportunities to reduce the cost, improve the reliability, and enhance local control of the supply of electricity to its residents. Davis created a plan to provide energy efficiency measures and information to businesses and residents in Davis, especially small businesses and a large student renter population.

Scope / Scale
Davis has about 62,000 residents and many small businesses. Davis has a high proportion of renters, 58 percent, and has nearly 10,000 multifamily apartment units. The Davis Energy Efficiency Program (DEEP) ran from October 2002 to June 2004 with a budget of $1.9 million. The program was expanded to cover all of Yolo County in 2004, and the renamed Yolo Energy Efficiency Project (YEEP) received $1.97 million for efficiency measures and $1.2 million for information and market transformation efforts through 2005. DEEP included measures aimed at single family and multifamily residential customers as well as commercial customers and schools.

Results
The program produced evaluated savings of about 3,500,000 kWhs. DEEP has a self reported total resource cost benefit ratio of 1.58 ($1.79 million in costs to $2.83 million in benefits) and a participant cost benefit ratio of 4.0 ($920,000 in costs to $3.78 million in benefits).

Success Factors / Lessons Learned
- While local programs need flexibility to adapt efficiency and outreach measures to local conditions, administrative tools such as databases can be used across programs to increase accuracy and usability while reducing administration costs.
- Community-based programs can be testing grounds for efficiency innovations, such as DEEP's window mounted evaporated cooler, which can be adopted more broadly once shown to create proven energy savings.
- Program evaluations of community-based programs need to measure both qualitative and quantitative impacts to capture the true program impact.

Other Concepts

The four examples below either did not have sufficient history to support a full program review, or, in the case of the Hood River Conservation Project, have already been well documented but still have lessons that are useful to consider. The information presented is informal with a brief description of the concept or program, and some key lessons learned or potential strategies.

Solar Bonds: San Francisco and Honolulu

In 2001, 73 percent of San Francisco voters approved a ballot measure to issue $100 million in revenue bonds for solar, wind, and energy efficiency. The "Solar Bond" was put on the ballot with the expectation that available financing would enable solar installations on government buildings that would be paid for with the energy bill savings. Over three years later, however, the bonds have not been issued. A number of barriers to the issuance of the solar bonds have arisen, not the least of which is that most of the San Francisco government purchases power at below market rates ($0.0375 per kWh) from Hetch Hetchy Water and Power, which means that the energy bill savings from solar installation will be insufficient to repay any bonds. Moreover, the Hetch Hetchy Enterprise has never issued bonds before, so does not have any history of bond ratings or the business plan necessary to receive a rating. Also, at the time of passage, all of the specific renewable and efficiency projects were not lined up, a factor considered necessary before bonds can be issued. Advocates and policymakers are currently working to overcome all of these barriers to the solar bonds.

One of the showcase projects discussed as a use for the bonds was a solar and efficiency installation at the Moscone Convention Center in San Francisco. This project has proceeded despite the lack of solar bonds, using $7.2 million in funding from Hetch Hetchy revenues through what is known as the Mayor's Energy Conservation Account. The Moscone project was completed in March 2004 and features 675 kW peak solar and 800 kW in demand reduction (6.6 million kWh annually) through efficiency. The efficiency has an expected payback period of 13 years, while the solar has a payback period of 30 years. Most of the publicity for the project has focused on the solar, which raises one of the key lessons of this effort; while renewables are very publicly popular, efficiency remains more cost effective in most cases, so combining the two may be the best way to create projects that gain community support and produce cost effective demand reduction.

The nonprofit Vote Solar has continued to promote the Solar Bond concept around the country, including in Portland. In 2004 the Honolulu city government approved a $7.85 million solar bond. A $20 million revenue bond bill for renewables and efficiency was introduced in the New Mexico Legislature in 2004; it did not pass in that session, but has been reintroduced in 2005.

Hood River Conservation Project: Hood River, Oregon

The Hood River Conservation Project (HRCP) was one of the original community-based energy efficiency projects (c. 1984-1985). The HRCP was designed to demonstrate and document the maximum achievable participation and retrofit measure penetration within a limited timeframe. The HRCP targeted 3,500 electric heated homes with a comprehensive set of efficiency measures at no cost to the participants. Measures included R-49 attic insulation, R-38 floor insulation, drill-and-fill wall insulation, blower door guided infiltration, and triple glazed windows.

The HRCP effort included other atypical features. For example, although the sponsors of the project were well known in the region and community (Bonneville Power Administration and Pacific Power), a "project brand" was developed and supported. The project was exclusively known as The Hood River Conservation Project. The level of detailed evaluation planning and the comprehensive market strategy were both unique for energy efficiency programs at the time.

The evaluation plan produced more than 24 reports analyzing the result of the project. A total of 91% (3,189 out of 3,500) of all eligible customers participated. Recommended measures were installed in 85% (2,989 of 3,500) of the eligible homes. Energy savings were significant, but lacked stable persistence. The comprehensive market strategy was developed but not implemented, because of extreme community interest created by word-of-mouth.

The HRCP was a leading edge DSM demonstration effort and, with its detailed documentation, provided valuable data and lessons learned. The community-based aspects of the project, such as community branding and marketing, are relevant to the Energy Trust, although some of the unique project design features (e.g., free measure installation, aggressively comprehensive measure packages) are likely of less interest. Because the aggressive goals exceeded the business infrastructure's delivery capability, the HRCP also developed bidding and work assignment strategies in which both local and outside businesses could participate in.

Matching Efficiency Grants to Green Power Purchasing

The Massachusetts Technology Collaborative encourages customers to purchase green power by providing a dollar for dollar match to local communities. The community can use the match to support green power education and the installation of renewable energy systems, including the purchase of renewable energy credits (RECs). In Massachusetts, half of the available matching funds can be used for education and the purchase of renewable energy systems, the other half can be used for low-income projects to support the installation of renewable energy systems or energy efficiency.

This program could be adapted to support energy efficiency investments in municipal buildings, schools or other types of projects. The matching grant promotes green power purchasing by providing consumers with the extra incentive of leveraging their green power purchase and creating resources to help make their community more energy efficient. It may also provide a catalyst to increase the number of efficiency projects being undertaken in the municipal or educational sector.

Community Wind/Efficiency Programs

The review of community energy programs did not find a project that explicitly tied an efficiency program to a community wind project. However, the Energy Trust's interest in community wind may make an excellent fit with the proven model of community investments in efficiency. Options include using the revenues from wind generation to fund efficiency investments over the long term, or combining energy efficiency with a wind project to improve financial performance in the short term.

A majority of wind power currently being produced in the world's leading wind power producing nations comes from community owned projects. There are at least 43 Community Wind projects already up and running in the U.S., including several in the Northwest. These community wind projects are all generating revenues, usually in excess of those required to meet the debt service burden of the turbine install cost. As with community-based efficiency programs, these projects capture and retain more of the economic benefits locally (both construction-related and ongoing returns) and encourage reinvestment in the communities. Within these projects, there are numerous variations in debt, equity and grant financing models. There is also significant variation in ownership structures as well based on power purchase agreements and sometimes sale of green tags. There are likely opportunities to develop wind/efficiency combined program structures and financing methods drawing on these examples.

Appendix C: Program Review Details

Neighborhood Power Project

Seattle City Light
Seattle, Washington

Description: A series of annual, neighborhood-based projects that target residential and small commercial energy efficiency in conjunction with other neighborhood issues.

Key Project Features:

1. **Purpose:** The primary goal of the Neighborhood Power Project is to get additional energy and resource efficiency in urban, hard-to-reach neighborhoods. Secondary goals include working to identify and rectify other issues defined by the community. The Neighborhood Power Project can serve as a catalyst to get other neighborhood issues addressed. The list of project partners for non-energy features of the effort can be very substantial, ranging from tree planting to crime prevention.

2. **Selection:** Seattle City Light (SCL) works with Seattle's Dept. of Neighborhoods, Seattle Police, and Seattle Public Utilities/Water to identify neighborhoods that meet three general criteria; diversity of income, diversity of ethnic background, and resource savings potential. The activity level of the neighborhood association is also considered. Neighborhoods are ranked, and the city is working through all of the higher priority neighborhoods. One project is completed every year. The project has been operating since 1995.

3. **Scale:** The neighborhood selected is typically between 8,000 to 12,000 addresses. Each project operates for one year, including initial planning and organizing functions.

4. **Scope:** Projects encompass small business, multi-family, and single family residences. Energy efficiency workshops and school demonstrations are included. If possible, a small solar PV demonstration project is included through another program.

5. **Strategies:** The projects include a variety of operational strategies. In marketing the project, the Neighborhood Power Project starts by working with existing neighborhood organizations. Direct mail is sent to all residents, businesses, and property owners in the selected area to solicit volunteers as well as interest in program services. They work with neighborhood newspapers and newsletters to promote greater community response. SCL staff also attend various community

meetings and present information about the program and energy efficiency. The project also works to involve schools, such as recruiting students in the Science Dept. in the distribution of CFLs, and the math teacher giving students real world energy-related problems to solve. Students can accrue community services hours for work related to the project.

Implementation is a mix of conventional program services and volunteer/self install efforts. Businesses are encouraged to participate in the Smart Business program, which provides 60% incentives for lighting retrofits. The project adds an additional 10% to this incentive to increase participation during the project time period. Multifamily property owners are eligible for 50%-70% incentives for common area lighting and insulation, and up to $5/foot for windows under the Multifamily Weatherization program. Insulation is free if half of tenants meet income guidelines under the Low Income Multifamily Weatherization Program. Volunteers offer to distribute two free CFLs to their neighbors. Free energy audits are offered for houses, and showerheads and aerators are provided during the audit.

6. **Resources:** SCL provides the organizational resources and energy efficiency funding; other non-energy efficiency project support may come from other city resources and non-profits, but varies by project and project needs. SCL provides a full-time coordinator, a .5 FTE administrative assistant, a .5 FTE field service staff (auditor), and about $30,000 in funding to send mailings, buy CFLs. and support community events. Measure incentives are provided through the Smart Business program, and Multifamily Weatherization program. Program costs are about $200,000 plus incentives.

7. **Management:** SCL staff are the prime organizer and coordinator of volunteers and resources. While they listen closely to community needs, staff make the critical decisions regarding marketing and resource allocation associated with energy efficiency even, for example, selecting a logo and developing marketing materials.

Results:

1. **Evaluation:** There has been no formal evaluation of the Neighborhood Power Project. Other projects that are included in the effort have been evaluated, for example, the Smart Business Program. Participation and estimated savings are tracked and reported as a standard part of operations. The team working on the project does a year-end review to discuss what worked and what should be changed.

2. **Quantitative:** Over the last 4 years, annual energy savings have averaged about 1,100,000 kWhs per neighborhood project. Slightly more than half of the savings come from the Smart Business program, with the remainder coming from the residential sector. The number of CFLs distributed had been rising rapidly over

the years, with the 2003 project providing 13,000 CFLs, before dropping off to 7,000 CFLs in 2004.

3. **Qualitative:** The projects appear to generate substantial local publicity and goodwill in the communities served. Neighborhood newspapers provide coverage of the events and process. City council members come to some events. SCL views the projects as a valuable community relations effort, creating goodwill with communities and getting to hard to reach customers. The project also provides a focal point for other neighborhood improvement projects to work with.

4. **Barriers:** The project manager reported no significant operational barriers. Communities do express needs that may go unmet although related to energy, for example, improving lighting in commercial districts where crime is an issue.

   Several adjustments have been made over time to streamline the projects and keep them aligned with goals. These include having staff make initial marketing implementation decisions (logo design, mailing contents), and maintaining a focus around energy and related issues, as opposed to traffic management and crime prevention issues that may be at the top of the community's list of needs.

Success Factors:

- Consistent support from SCL.
- Repeatable, multi-year strategy.
- Working with established neighborhood organizations.
- Integration of multiple program elements.

Lessons Learned:

This is an excellent community relations effort that focuses on hard to reach residential consumers and small business. For the Energy Trust, the largest questions raised by this project are whether this level of community connection is desirable, and how would the Energy Trust partner with other organizations to achieve this level of connectivity.

The Neighborhood Power Project also demonstrates a fairly simple and very repeatable organizational framework. While the project listens closely to community needs, it still achieves energy efficiency with a straightforward approach that can add or subtract program elements as they are available or needed.

New London Resource Project

New London Utilities and Wisconsin Gas Company
New London, Wisconsin

Description: **A multi-utility supported demand-side management pilot program designed to demonstrate the energy and cost saving benefits of substantial community involvement.**

Summary of Key Project Features:

Project Purpose: Wisconsin Public Power, Inc. (WPPI), a joint action agency of over 30 municipal utilities, was seeking an energy efficiency program strategy that could be transferred to other utilities that it served. The New London Resource Project (NLRP) was a pilot program designed to demonstrate that a community-based demand-side program that was designed and delivered with substantial community involvement would produce more long-term conservation at a lower cost than traditional utility demand-side management efforts.

Key goals of the NLRP include:

- Capture cost-effective large energy and demands savings per participant;
- Emphasize community involvement and ownership in the project;
- Incorporate unique marketing and program strategies that use price and non-price signals;
- Use positive cash-flow financing as an alternative to rebates to promote program participation; and
- Develop a community products infrastructure to allow the project to persist after the pilot ends.

The program design and its core elements were driven by a market assessment of the community prior to program initiation. Three barriers were identified.

- Customer's were not familiar with energy saving options, their benefits, and costs;
- Customer's avoidance of hassle, transaction costs, and risk involved in selecting and working with contractors to complete projects; and
- Lack of access to capital to undertake efficiency improvements

Community Selection: WPPI solicited applications from it municipal utility members to be selected for the community-based, demand-side management pilot project. The application included information about the utility and community, it's past and current energy efficiency programs, its community organizations and other entities that would support the project, preliminary concepts for a program, potential funding and in-kind resources, other activities in the community that showed it can succeed on a large scale project, and identification of key people in the community that would be involved in the project.

There were six applications from communities, and New London was chosen as the pilot community.

Scale: New London is located in the northeastern part of Wisconsin approximately 37 miles southeast of Green Bay, WI. It has a population of 6,750. It is a highly industrialized for its size with two large industrial manufacturers that employ close to 1,200 people, and a number of small and medium-sized manufacturers. The New London Resource Project operated from 1992 through 1995. The budget was set at 2-3% of New London Utilities annual revenues, totaling approximately $550,000 over the life of the project for planning and implementation. New London Utilities and Wisconsin Gas each paid a portion of the project implementation costs. The program began in mid-1992 with project planning and market assessments and implementation ended in 1995.

Scope of Project: The NRLP had an extensive array of program initiatives that provided demand side program opportunities for residential, commercial, and industrial customers. Electric (peak demand and energy), natural gas, and water savings were key metrics for NLRP. All program components featured a strong educational focus that explained the New London Resource Project, the benefits for the community and its residents, how to participate, and the key attributes of the programs.

Key program elements were:

- Marketing driven by a series of community focus groups
- An active Community Advisory Committee that provided input into program design and marketing, and served as "ambassadors" for the project in the community
- Energy Fairs
- Residential and commercial building assessments
- Financing in lieu of rebates
- Low-Income services coordinated with a Community Action Agency
- Contractor arranging
- Industrial audits
- Residential new construction and renovation plan review
- Retailer product stocking and training
- Schools program

Program Strategies

NLRP Marketing

The Community Advisory Committee (CAC) provided input to the sponsoring utilities and project manager on all marketing strategies and materials. For example, the CAC decided not to allow telemarketing to recruit residents for residential assessments. Besides traditional marketing materials that explained how different programs operated and defined benefits, there was an unusually broad array of marketing initiatives, including:

- "**Pass It On" Cards** When a NLRP program service, such a residential assessment was completed in a home, the customer was provided a "Pass It On" card to give to a neighbor or a friend.
- **Targeted Direct mail and Door Hangers** Brightly colored residential home assessment brochures were sent to targeted neighborhoods a few weeks before the home auditors served the neighborhood. The day before the auditors begin work in a neighborhood, door hangers were placed on all doors.
- **Resource Partner Volunteers** In community focus groups, residents requested an active part in NLRP. Resource Partner Volunteers were created to conduct home visits to provide energy education and schedule home assessments. Resource Partners also visited homes of participants to determine satisfaction with services and encourage marketing.
- **Restaurant Placemats and Posters** The NLRP marketing team created and printed customer placemats that included a local map, photo of New London, energy puzzles, project logo, testimonials, and project phone number. The placements referred customers to a poster by the front door that had a mail-in card to sign-up for a home assessment. Several of the New London restaurants agreed to use the placemats.
- **Newspaper and Radio** Local media provide promotions and coverage of key events and developments.
- **In-Store Demonstrations** Local stores provided energy efficiency product demonstrations, specifically lighting and weatherization. Promotional give-aways and home assessment sign-up were also part of the demonstrations.
- **Product Promotion by Retailers** Individual retailers advertised and distributed flyers targeting sales of energy efficiency products. Some marketed rebate coupons on specific products. The NLRP issued coupons for discounts on compact fluorescent bulbs, redeemable at local retailers.
- **Conservation Checks** Conservation Checks in the amount of $100 were provided to customers to purchase conservation product at local retailers. Customers could redeem the Conservation Checks up to $100 for energy efficiency purchases at a participating retailer, and pay for purchases on their utility bill, if they completed the appropriate paperwork at the retailer.

- **"Where to Buy Energy Efficiency Products"** Retailers and contractors were listed in a brochure that served as a buyer's guide for energy efficiency product and services in New London.
- **Energy Fairs** Two community Energy Fairs were held in New London. The kick-off Energy Fair attracted close to 1,000 people.

Implementation Strategies

Residential Energy Assessments A key program of NLRP was the Residential Energy Assessment. The assessment included direct installation, energy education, and a home walk-thru that identified major energy efficiency opportunities. Customers paid $35 for homes heated with natural gas and $19 if the home was heated with electricity, fuel oil, propane, or other fuels. Services included:

- Blower door test (not included in the $19 package)
- Walk-thru audit Direct installation of low-cost energy and water savings measures
- Brief report of major measure opportunities including estimates of savings and costs
- List of available contactors to complete work - assistance with contractor bids
- Quality control of installed major measures
- Referral to Low Income Weatherization services if appropriate.

. **Financing** Positive cash-flow financing on the New London Utilities utility bill was available. The cost of assessments and in-home purchases such as lighting could be financed with major measures. The premise behind positive cash-flow financing was that monthly utility bill repayments would be lower than monthly savings from the energy efficiency investments. Contractors could use the financing with their energy efficiency work.

Commercial Assessment A dinner was held to explain the commercial assessment and services to local business owners. Over 21 signed-up for an assessment at the dinner. An assessment consisted of a walk-thru audit and detailed report, positive cash-flow financing and contractor arranging, if necessary.

Industrial Services An industrial committee was convened to discuss NLRP strategies for providing energy efficiency services to industrial customers. Technical assistance and financing were important components of industrial services. Businesses in food processing, wood drying, metal fabrication, and cheese making expressed interest in improving the energy efficiency of their operations. Working with the CEO and/or facility engineers improvements were completed in lighting, motors, and HVAC, including a large boiler replacement at the cheese factory.

New Construction/Remodeling New London Utilities offered customers building new homes or designing major renovation projects on existing homes free plan review services to identify energy efficiency improvements that could be incorporated in the new home or renovation.

Schools Program There was an ambitious plan to incorporate conservation and environmental curriculum for grades 3 through 12. Lower grades were to receive coloring books and energy activity packages. However, there was only limited involvement from teachers and school administration.

Retailer Product Stocking and Training NLRP conducted a stocking survey of retailers to determine the availability of energy efficiency products in the community. The survey found only a few products on retail shelves as retailers were hesitant to carry items with no or limited customer demand. Compact fluorescent lighting was virtually non-existent. To remove the risk barrier, New London Utilities decided to provide compact fluorescent lighting to retailers. Eight retailers participated and were restocked once a month. Lighting displays and literature stands were also provide to retailers. Sales staff were trained about the product characteristics and benefits compared to incandescent lighting.

Resources: The NLRP was a collaboration between New London Utilities, a municipal utility, and Wisconsin Gas Company, an investor-owned utility with headquarters in Milwaukee. WPPI provided in-kind support by allocating a small amount of staff time to assist with the project. Total project costs for the New London Resource project were approximately $550,000 for planning, design and implementation. The costs also do not include time spent by employees at New London Utilities and Wisconsin Gas Company.

Management and Staffing: Wisconsin Energy Conservation Corporation was the primary project contractor and provided development, design, and implementation services to the co-sponsors. They also had the responsibility to train teachers, retailers, contractors, and volunteers about NLRP and their roles in the project. WECC had a staff person housed at New London Utilities to perform residential assessments. Other staff assisted with commercial audits. WECC was also responsible for the program tracking database. In all, six staff members at WECC played a role in the project, with only one, the residential home auditor, working full-time on the project.

The Community Advisory Committee is an oversight and input body that is comprised of 14 members, including 3 utility members. The committee was selected strategically to cover constituencies in the community that could play a key role in gaining support and participation in the NLRP. There were 14 members including representatives from utilities. The CAC had decision making power and influence in the design and content of the marketing, program strategies, and implementation. Committee members had residential assessments

of their homes and were "NLRP ambassadors" in the community. They meet often in the early stages of the project and monthly after implementation began.

WPPI provided in-kind support for program planning and design in collaboration with the contractor (WECC), and marketing assistance. The Manager of New London Utilities was very active in the program decision-making and strategies. New London Utilities staff had a very active and visible role in the project, attending events, speaking to community organizations, and embedding the NLRP in all facets of utility operations. Wisconsin Gas Company provided financial support, access to its heating equipment and water heating rebates, and representative on the CAC.

Project Results

Evaluation There were no impact evaluations of NLRP. Savings were tracked based on deemed savings. Two process evaluations were completed. One was an interim evaluation, and the other a final New London Resource Project Report by Megdal & Associates.

Quantitative Results New London Utilities kept track of projects completed and savings captured by the NLRP. These are provided below.

- Residential and commercial positive cash-flow financing on the utility bill totaled approximately $600,000; default rate of payments was less than 1%; 15% of the financing was in the residential sector
- First year savings for all sectors totaled 3 million kWh, over 125,000 therms, 0.75 MW demand reduction.
- About 750 homes had residential assessments (25% of residential customers)
- Over 75 businesses participated in audits

Qualitative Results

Residential

- Over 79% are satisfied with their participation in NLRP
- Almost 85% of participants that installed major measures were satisfied with the program compared to only 54% of non-installing participants
- Program participants are more likely to report having discussed the NLRP with at least some other people in New London (72% vs. 28%)
- 77% of all New London customers were aware of NLRP
- Since 1989, 95% NLRP participants completed energy efficiency installations compared to 77% of non-participants

Industrial and institutional Customers

- In some instances contractors referred the customer to the NLRP, showing the value of the working relationship between NLRP and trade allies
- New London Utilities Manager involvement in projects induced customers' commitments to install energy efficiency measures
- Energy audits served to identify "next steps' and not lead to immediate installations
- Keys to success – engineering/technical expertise and access to financing

Trade Allies - Contractors

- Trade allies characterized NLRP as a benefit to the community and their business
- Some contractors marketed the program, while other depended on NLRP
- Contractors had positive image of NLRP and its strengths – marketing, financing, and coordination; negative program attributes from a few contractors – program had limited success with large industrial customers and up-front bidding anti-competitive

Project Barriers

- Wisconsin utilities have offered energy efficiency programs for over a decade; available major measure opportunities such as insulation has declined.
- Unfamiliar major measure opportunities, such as air sealing, were not installed; participants needed more education and perhaps demonstration projects
- Building ownership characteristics limited the measures installed in small commercial businesses

Success Factors

- Community Advisory Committee was selected strategically to address and communicate with many community constituencies; CAC members had a large role in NLRP design, implementation, and marketing resulting in project ownership. Dedication and time spent on NLRP raised the visibility of the project in the community.
- Kick-off Energy Fair was very well attended, started the educational process, and created a "buzz" in the community about NLRP.
- Focus on energy education and a variety of marketing tactics created word-of-mouth program referrals among community residents.
- Visible and involved manager at New London Utilities gave the project credibility, enhanced the utility standing in the community, and increased customer participation.
- Positive cash-flow on the utility bill eliminated a barrier to major measure installation - access to capital

- Broad array of products and services covering all fuel types enhances participation – all community residents could participate.
- Working relationship with New London Utilities and trade allies; contractors marketed NLRP to customers.
- Project duration allowed for energy education to influence customers and provided a consistent long-term platform for purchases and sales of energy- efficient equipment, product, and services, especially in the commercial, institutional, and industrial sectors

Lessons Learned

- Community involvement and ownership is very important to the success of a community energy efficiency project. The advisory committee must contain diverse mix of community leaders
- A project champion is needed that brings credibility and vision to the project. The local utility manager served that role in New London.
- A multifaceted marketing campaign reaches customers in many places and in many different ways. This reinforces the energy efficiency message and project services and benefits
- Positive cash-flow financing on the utility bill eliminated the barrier of lack of capital access.
- Residents need to take ownership of some project services to realize long-term sustainable benefits, such as contractor selection.
- Need education and demonstrations when introducing new technologies to gain acceptance and adoption by customers – blower door and air sealing.
- Personal interest and relationships with industrial and institutional customers can induce project participation and measure installation – CEO and Utility Manager.

Jasper Energy Efficiency Project

Alberta Power
Jasper, Alberta, Canada

Description: A single community project focused on substantial demand reduction as an alternative to grid or generation capacity expansion.

Summary of Key Project Features

Project Purpose: Jasper is a community of 4,500 residents located in Jasper National Park in west-central Alberta. The community is isolated from the Alberta electric grid and peak demand had grown from 6.3 MW to 11.9 MW in the period 1981-1991 due to expansion of the commercial and industrial sectors. Peak demand occurs in winter due to the influx of tourists during the holiday season in December. The area attracts tourists for skiing and other winter sports.

Alberta Power Limited, an investor-owned utility, supplies electricity to Jasper. Generation of electricity in 1991 was limited to a natural gas-fired generating station and a hydro-electric plant. Total capacity available was approximately 16 MW. The generating capability was close to being exhausted by winter peak demand. There were three options considered to meet electric demand.

1. Build a transmission line to Jasper at a cost of $8.4 million dollars;
2. Expand the generating capability - $2.45 million for 2.8 MW; and
3. Reduce demand through energy efficiency.

Alberta Power decided to target a 2 MW reduction in demand (20%) with 500 kW from the residential sector and 1,500 kW in the commercial sector. Other objectives of the pilot project included:

- Test the cost-effectiveness of energy efficiency versus supply options.
- Determine customer acceptance of a variety of energy efficiency measures and understand the effectiveness of each when installed in homes and businesses.
- Reduce the environmental impact of power generation on Canada's largest National Park.

Community Selection: As described above, the community of Jasper's peak demand was exceeding available capacity and energy efficiency was chosen over building a transmission line or adding additional generating capacity.

Scale: Jasper is a community of 4,500 residents with customers divided in the following utility classes.

Customer Class	Number of Customers	Demand (kW)
Residential	1,257 (85.8%)	2,169 (18.2%)
Commercial	192 (13.1%)	6,880 (57.8%)
Industrial	16 (1.1%)	2,852 (24.0%)
Total	**1,465 (100%)**	**11, 901 (100%)**

The Jasper Energy Efficiency Project (JEEP) began in 1991. Residential and commercial/industrial customer and building surveys were conducted in the late summer and fall of 1991 to determine customers' attitudes on energy efficiency upgrades and the potential energy improvements in the building stock. A contractor performed an economic analysis of measures. Efficiency measure selection and program design were completed in May 1992. Residential programs were implemented beginning in September 1992 and commercial program were initiated in January 1993. Project evaluation was completed in June 2005.

Funding for the project totaled $1,680,000.

Scope: Program efforts were confined to capturing cost-effective savings in the residential and commercial sectors. The economic analysis indicated a potential demand reduction of 2.995 MW and close to 7.8 million kWh savings. The Public Information Committee, a committee comprised of community residents, (details below) decided not to include a refrigerator buy-back program, home heating conversion program (electric to gas), and interruptible rates as strategies for JEEP. Programs implemented were:

- Residential Block Heater
- Residential Lighting Efficiency
- Residential Water Heating Fuel Conversion
- Commercial and Industrial Efficiency
- Street Lighting Efficiency
- Residential and Commercial Information

Program Strategies

Residential marketing was implemented to create public awareness about the Jasper Energy Efficiency Project. An intensive advertising campaign was launched with newspaper ads, bill stuffers, brochures, signage, etc. The local paper ran many stories about the project and information about participation. Once JEEP was in its implementation phase, many project communications included testimonials from local residents. A JEEP office was established in the existing Alberta Power district office to serve as a focal point for community residents and businesses for information about the project, as well as a contact point for scheduling Home Visits and commercial audits.

An Alberta Department of Energy's Energy Bus was used to demonstrate "how and where" energy was utilized in the commercial sector. At project inception, three staff members on the Energy Bus conducted audits of a cross section of 14 commercial buildings to determine potential measures and savings for the JEEP program. The commercial program gained momentum from the marketing and implementation of the residential program. Customers participating in the residential Home Visits were also business owners. Many decided to have commercial audits based on the positive experience with the Home Visit.

The residential portion of JEEP began on September 1, 1992 and was completed on February 5, 1993. JEEP teams went door-to-door explaining the project to homeowners. They sold products and provided installation services. Targets for incentives were set at maximum of 80% of the cost of measures up to $315/kW saved. The target participation rate was set at 75% of households. Alberta Power and the Public Information Committee set the residential budget at $224,000 with projected demand savings of 453 kW.

A variety of energy saving products were available to Jasper residents by the JEEP Team or for purchase through the local hardware store. All products were discounted to customers.

- *Power Saver Cords* – activate block heaters in vehicles when the temperature drops below 19 degrees F. JEEP Team sold coupons for the cords redeemable at local service stations
- *Compact Fluorescent Bulbs* - ten different CFLs were available for purchase by customers.
- *Timers* - Each household was limited to two indoor timers and two outdoor timers.
- *Water Heater Conversion* – An incentive of $280 was offered for residents to convert their electric water heaters to natural gas. 8
- *Space Heating Conversion Pilot* – one home that was being remodeled converted its space heating from electricity to natural gas forced air heating, saving 3 kW of demand. Given the cost, Alberta Power limited space heat conversions to natural gas to homes undergoing renovation.

The commercial component of JEEP began on March 1, 1993 with free audits of commercial facilities. Audits continued until December 31, 1993, with installation of recommended measures extending until September 1, 1994. Four auditor/ installation firms were contracted from Edmonton to perform audits and complete the retrofits. Targets for incentives were set at maximum of 40-60% of the cost of measures that reduced peak demand up to $315/kW saved. The intent was to bring the customers payback period to between 1-1/2 to 3 years. The major efficiency retrofits completed in the commercial sector were lighting (hard-wired installations), heating conversions to natural gas, ventilation, and air conditioning.

The Canadian Parks Service converted Jasper's 362 street lights from mercury vapor to high-pressure sodium.

Resources: The tables below provides information on the total cost of the project by Overall Cost, and by Administrative/Implementation vs. Incentive Cost. All costs are converted to U.S. dollars.

Overall Cost of JEEP

Participant	**Cost**
Alberta Power Limited	$980,000
Customers	$630,000
Natural Resources Canada*	$70,000
Canadian Park Service	$42,000
Total	**$1,722,000**

* JEEP planning funding

Administrative/Implementation vs. Incentive

Activity	**Customer Incentive**	**Administration & Implementation**	**Total**
Planning	N/A	$102,670	$102,670
Residential Program	$79,063	$161,589	$240,652
Commercial Program	$439,753	$156,990	$596,743
Evaluation	N/A	$39,697	$39,697
Total	**$518,816**	**$460,946**	**$979,762**

4. **Management:** Alberta Power was the main driver of the program. Staffing was a mix of utility personnel, local residents, and outside contractors for commercial audits/installation.

Alberta Power created the Public Information Committee (PIC) at the inception of JEEP to provide local input and guide the project. Local interest groups, such as representatives from the School District, Hospital Board, environmental groups, and Chamber of Commerce, and members of the general public were asked to serve on the PIC. PIC members had input on all facets of JEEP including program strategy and marketing. Their community knowledge and insights were invaluable to Alberta Power during the development of the project components and added credibility to the residents of Jasper.

Administrative and implementation functions were staffed by both Alberta Power and community residents. The JEEP coordinators (residential and commercial) were Alberta Power personnel and the JEEP Team (4 - field staff) were local residents trained by utility staff. The JEEP Team served residential customers. Four commercial auditor/installation firms were contracted from Edmonton, given the lack of expertise in local firms. Local electrical contractors were not interested in participating in the program. They had year-round work and did not want to increase staff for a short-term project.

Project Results

Evaluation

Monitoring, bill analysis, telephone/mail surveys, and stakeholder interviews were conducted to determine the impact of JEEP, both from a quantitative and qualitative perspective. Alberta Power developed a statistical analysis software package to track progress in the residential sector. JEEP field teams completed detailed Home Visit Reports that captured the number of measures installed in a home, wattages, occupant usage patterns (peak, off-peak, etc.). Peak savings progress was tracked daily as more data from site visits was entered into the model.

Billing analysis was conducted for the residential sector. However, less than 33% of customers showed any bill impact from the efficiency improvements. Alberta Power's billing system estimated kWh consumption every other month for residential customers and over 30% of Jasper residents have equalized monthly bill payments to avoid seasonal bill shocks. These two situations made it difficult to rely on billing analysis for determining energy and dollar savings.

Customer Surveys

A telephone survey of 358 of 958 program participants provided the following key findings:

- Ninety-six (96%) of respondents were very satisfied with the JEEP Team performance.
- Thirty-eight (38%) undertook additional energy efficiency improvements in their homes based on information provided by the JEEP Team.
- Literature provided during the home visit was read by 80% of survey participants, but 70% did not find the content to be very informative.
- Customers were very pleased with the performance of the compact fluorescent bulbs – (92% of participants purchased on average 6.8 bulbs)
- Fifty-two percent (52%) of indoor timers were being used rarely or not at all; of those in use, less than 20% were controlling appliances that reduced peak demand
- Outdoor timers for holiday lights and block heaters were not in use in 26% of the homes that purchased them.

For the commercial sector, program records, site documentation, and tracking systems were analyzed, and site visits, and phone surveys were conducted. An impact evaluation was conducted, but was not available. Sixty-five participating business responded to the telephone survey. Key findings are below:

- Reason for program participation – 58% save money, 12% environmental concerns, 11% conserve energy, 6% financial incentives, 6% support community efforts, and 7% other

- Most (84%) rated the program very highly – knowledgeable utility and contractor staff, performance of products, and the availability of incentives
- Main drawback of the program was the length of time required for application approval process for recommended measures and incentives
- For program drop-outs (audit but no measure installation), available capital was mentioned as the main barrier to installation; other reasons mentioned included high cost of installation and long payback periods

Stakeholder interviews including utility personnel, staff from Natural Resources Canada, Parks Canada, Jasper National Park, JEEP Team members, commercial auditor/installation firms, and local product supplier (hardware store) were conducted and two key findings were noted. The strength of JEEP was rooted in the community support and, the skills and hard work of the Project Coordinator. Most stakeholders believed that an evaluation plan at project inception would have resulted in better information on peak demand goal attainment.

Quantitative Results

The JEEP savings for both the residential and commercial programs are provided in the table below.

Program Sector	Annual Energy Savings	Demand Savings
Residential	891,589 kWh	490.4 kW
Commercial	5,428,739 kWh	1,620.2 kW
Total	**6,320,328 kWh**	**2,110.6 kW**

Other key quantitative results include:

- With JEEP, the demand for peak power between 1991-1994 in Jasper was reduced 9.6% (11.9 MW to 10.8 MW), while the Alberta Power peak power demand increased system-wide by 17.5%.
- JEEP program goal of 2 MW peak capacity savings was exceeded by .11 MW
- 891 of 1,296 households participated in JEEP (69%)
- Residents purchased over 4,700 CFLs, 817 Power Saver Cords, and 696 Timers, and converted 29 electric water heaters to natural gas
- 180 of 210 commercial businesses had audits (86%)
- 110 of the audited businesses installed the recommended measures (52%)
- The cost/kW of the residential program was $626/kW and the commercial $487/kW; compared to a capital cost of $980/kW for a new generating unit
- Air emission reductions at the Palisades Generating Station were 3,128 tons CO_2 and 6.6 tons NOx

3. **Qualitative Results**
    - Media attention was overwhelming, creating the need to hire a local resident as a communications representative. The project received extensive local, provincial, and national media.
    - Jasper Energy Efficiency Project is considered the most successful energy efficiency project in Alberta and has won multiple awards.
    - Enhanced customer satisfaction with Alberta Power.
    - Local supplier, Home Hardware, continued to stock energy efficiency lighting and other products after JEEP ended in 1994.

4. **Project Barriers**
    - Supply of program products from hardware store were inadequate at times to meet program demand
    - Media interest in JEEP created demands on project staff - implementation work became less productive
    - Commercial ESCOs did not always meet expectations – poor audits and services led to customer dissatisfaction, which reflected negatively on JEEP. 2 of the 4 commercial ESCOs were replaced.
    - Customers believed Alberta Power guaranteed products and measures for their rated life; premature failures were directed to Alberta Power for replacement
    - Some Alberta Power staff felt JEEP was not in the best interests of the utility given its goal to reduce peak load
    - Difficult to identify decision makers for large corporations and national chains in local facilities – created delays in completion of commercial projects

Success Factors

- Establishing the Public Information Committee and hiring local people as JEEP Team gave the project credibility and momentum.
- Project design was simple, hassle-free, and basically a “turn-key” operation for participants.
- Strong educational component helped community residents understand the project and benefits of installed technologies, leading to more measures installed.
- Bringing local media into the project at an early stage created a high awareness of JEEP.
- Working with the local hardware store to supply products, and attempting to involve local trades in JEEP gained project supporters.
- Many JEEP participants installed efficiency measures beyond those targeted by the program and non-participants installed measures in their homes and businesses

Lessons Learned

- JEEP showed that a very targeted "resource acquisition" strategy can be successful with focused goals, a simple implementation plan, and a mobilized community.
- Projects can ramp-up quickly and be successful if the entity mobilizing the community is credible (utility); goals and objectives are articulated to the community; community residents are educated about the overall project; targeted technologies and program processes; price is a minimal barrier; technical details are simplified; and implementation is hassle-free.
- Access to capital prevented some commercial businesses from implementing recommended efficiency measures. A financing option may have led to a higher implementation rate of recommended measures.
- Administrative, education, and marketing costs of community energy efficiency projects can be high; JEEP's non-incentive costs were close to 50%. However, these costs can be justified in order to ensure a community-wide effort that results in high participation rates and meets stated goals and objectives.
- Use community businesses as product suppliers and trades as implementation entities, if skill sets match project needs.
- Artificial timeframes for program implementation can limit participation rates – each JEEP program had a set timeframe for implementation; while participation rates were high, they did not reach the target percentage of participants (85%).
- Evaluation plan must be crafted at program inception; systems must be established to collect pertinent data.

Sources

Jasper Energy Efficiency Project, Summary Repot, Volume 1, Alberta Power Limited Marketing Department, February 1995.

Alberta Power Limited – Jasper Energy Efficiency Project, Profile #107, The Results Center, 1996.

The Poultney Change A Light Challenge

Efficiency Vermont
Poultney, Vermont

Description: **The challenge focused on a single village, a limited period of time (one month), and one measure that every household and business can easily take, replacing at least one incandescent light bulb with an energy efficient bulb.**

Key Project Features

Purpose: Education, town, and business leaders in the village of Poultney, Vermont were interested in implementing a participatory campaign to demonstrate the positive impact each individual can have on energy use and the environment.

The call to action focused on the impact that one person can have by simply changing out a light bulb. Our goal was to inspire each person in Poultney, and ultimately each person in Vermont, to change at least one light in their home from an incandescent bulb to an ENERGY STAR® qualified bulb. This event was the only community-wide response to the US Environmental Protection Agency's national Change A Light/Change The World campaign.

The challenge identified a single village as the primary target audience, a limited period of time (one month), and one measure (replacing at least one incandescent light bulb with an energy efficient bulb). Choosing a measure that every household and business can easily take, and stating the campaign in the form of a "challenge" created a sense of responsibility and empowerment at both the community and individual level. By providing quick feedback and (in this case) positive results the challenge served to encourage further activity in Poultney and other Vermont communities.

Selection: Criteria used for selecting Poultney as the host community for this event included a location South of Route 4 (Efficiency Vermont tracks and reports on savings by county), a community with a well defined "town center", and willing local partners. An initial list of nine candidate communities was winnowed during early planning by making calls to potential partners to gauge interest from town, retail and educational partners.

Scale: The village of Poultney has a population of 1750 in 473 households. The challenge ran from October 4 to October 26, 2003. Pre-campaign planning, marketing, and public relations occurred from August through November 2003.

Total estimated costs for the Change A Light Challenge were roughly $86,000; with $50,000 of total labor, $9,000 of incentives and $27,000 for marketing and PR materials. These estimates of Efficiency Vermont costs do not include the labor and non-labor contributions from other partners. A subsequent event, "The 72 Hours of Light" in Middlebury, drew upon the previous experience and resulted in larger savings with a significantly lower cost of $35,000 for Efficiency Vermont support.

Scope: The Poultney challenge focused on residential and commercial lighting, each household and business was asked to replace at least one incandescent light bulb with an ENERGY STAR® qualified compact fluorescent bulb.

Strategies: Committed individuals from local business, government and schools conducted a multi-faceted campaign to encourage participation, educate, and publicize the challenge. A variety of energy efficiency presentations, classes and educational events were conducted at local schools, the nearby college and to town residents. Radio, newspaper, posters, and direct mail were all used to build awareness and excitement. The event was kicked-off on the town's Main Street during the annual Poultney community-wide flea market, homecoming weekend and chili cook-off, with a hands-on energy-efficiency displays, informational speeches about energy efficiency, and a live radio broadcasts.

The event strategically chose to support a local retailer by providing all lighting products through a local hardware store. During the event, each household and business in the community could come to this hardware store and receive one compact fluorescent light bulb at no cost with an option of buying up to five more at less than $1 each. Members of the community who did not come to the hardware store to participate in the first few days of the challenge (identified through a check-off list of all electricity accounts in the community) were then solicited for participation through door-to-door visits by students in local college class that was using this project as part of their class curriculum.

Resources: Vermont Energy Investment Corporation, acting as Efficiency Vermont, partnered with Green Mountain College, Williams Hardware and the Village of Poultney. Each organization played a significant role in the success of this Challenge.

Green Mountain College students participated as part of Dr. Steven Letendre's course entitled "Energy and the Environment". The students designed and constructed the progress towards the goal indicator, distributed CFLs to Poultney residents, designed and conducted a survey of residents' attitudes toward efficient lighting, and promoted awareness of energy efficient lighting to residents.

Williams Hardware hosted the Change A Light Challenge kick-off event on October 4th and worked with True Value and Westinghouse to provide the free bulbs for this challenge. After the kick-off event, Williams Hardware served as the pick up point for residents to get their free CFL until October 26th and offered special pricing on ENERGY STAR lighting products during this time.

The Village of Poultney welcomed the kick-off event in conjunction with an annual town celebration. They also, as a town, accepted and met the Change A Light Challenge. Town officials helped with bulb distribution efforts and facilitation of the kick-off event, which included a banner hung across Main Street in Poultney. The town was also offered, and received an additional incentive to assist with a comprehensive rehabilitation project to an abandoned building being converted to a community center.

The Vermont Energy Education Program (VEEP) conducted sessions at the Poultney High School (for 52 students) and Poultney Elementary School (for 65 students) two days before the community event. These activities helped to publicize the event, educate students about energy efficiency and explain the "Change A Light" Challenge.

Results

Evaluation: Efficiency Vermont conducted both internal and external partner surveys to gather feedback on the Poultney Change a Light Challenge. These evaluations covered feedback on the planning process, definition of goals and success, effectiveness of marketing pieces, procurement, coordination with partners, and suggestions for future events. In addition, a class from Green Mountain College prepared a paper/poster session for the American Council for an Energy Efficient Economy 2004 Summer Study Conference. Participation and savings were tracked and reported as standard part of EVT operations.

Quantitative: Virtually all (over 96%) of the community participated by replacing at least one incandescent bulb with an efficient ENERGY STAR qualified bulb. For each free bulb that was picked up at the hardware store, over 3 additional bulbs were purchased (a total of 3,284 bulbs were rebated in a store that serves a community of under 1,000).

Qualitative: As a result of their leadership and commitment, all of the event partners received a national ENERGY STAR award from the Environmental Protection Agency for the Poultney Change A Light Challenge.

Governor James Douglas issued a proclamation challenging all Vermonters to follow Poultney's lead. If every household in the state changed just one bulb they could save enough electricity to light 14,500 homes for a year. If every household in the U.S. replaced one incandescent light bulb with an ENERGY STAR® qualified bulb, the amount of pollution prevented would be equal to removing one million cars from the road.

Media coverage brought information about this event to Vermonters throughout the state resulting in greater knowledge, increased purchases of energy-efficient lighting, as well as interest in replicating this event in other Vermont towns.

In November of 2004 Middlebury, Vermont hosted the "72 Hours of Light" event. This event resulted in the distribution of more than 7,000 CFLs and 300 fixtures, in two days. Active support from partners in the community was critical to the Middlebury project, which, as noted above, required a much lower support budget from EVT.

Barriers: The Poultney and Middlebury events have been labor and marketing intensive efforts. Post event recommendations from internal and external partners have included trying to establish a clear calendar and list of organizational responsibilities as early as possible during pre-event planning. Better organization of activities such as coordination of the street lists and visits to individual households was identified as an area of potential improvement for the Poultney event. There was also some sentiment that a clearer articulation of who was the "team leader" and the overall responsibility would have been helpful.

It was noted that the case for these events is less compelling if considered only from the perspective of results for a single community, and that to be effective it is important to also gain media attention for energy efficiency, state commitments to efficiency, community empowerment, and to reinforce the message that small actions, when implemented by a whole community can make a big difference. Therefore, determining the appropriate level of effort will depend upon whether the initiative will be judged in the context of attempting to raise overall awareness of energy efficient bulbs or limited to a single community.

Success Factors

- Buy in and support from more than one community partner appears to be a critical factor to the success of these events. The early interest of one group, for example the local college, may be useful in getting other key players, such as the retailers and/or local government on board. Once an early "keystone" partner has been identified it is useful to take a sales type approach to get other key partners on board.
- The initiative defined and set an achievable challenge goal (e.g. one CFL lamp per household and business) with a short time horizon (two to three days).
- A central community event – in the case of Poultney a town wide Chili cook-off, was very helpful to get a large turnout on days that had very inclement weather. Therefore, if possible, piggybacking with another event that draws strong community participation is a good idea.

Lessons Learned

Suggestions for future efforts include:

- The establishment of an executive committee to help coordinate the activities;
- Emphasis on early planning;
- Establish a plan for those who want more bulbs than are available through the stocking for the event;
- Take advantage of student enthusiasm to help publicize and support these events.

Peterborough Green Up

Ontario Green Communities
Peterborough, Ontario

Description: **One of 25 similar non-profit projects in towns and cities in Ontario that feature energy efficiency as part of a larger effort to reduce waste and improve the local environment.**

General Background: In 1991, the Ontario provincial government launched an effort to spur grass-roots promotion of energy efficiency. Specifically, the government funded the creation of non-profit organizations under the banner of "Energy Efficient Communities" in three towns: Atikokan, Sarn6ia and Cornwall. The following year the mandate was broadened to include water efficiency, waste reduction and other environmental concerns, and the name was similarly broadened to "Green Communities". In 1993, four additional projects were started in Peterborough, Guelph, Elora and Port Hope, followed by projects in a number of additional towns, including several of the biggest cities in the province such as Toronto, Ottowa, Windsor, and London.

In 1995, a new provincial government was elected and provincial funding for the Green Communities initiative was eliminated. Several Green Communities folded in response. However, most survived by obtaining funding from various partnerships they had developed. A number of new Green Communities organizations have also been successfully launched since then. The movement has grown stronger in recent years with the advent of the federal EnerGuide for Homes program (sponsored by Natural Resources Canada) which provides subsidies for assessments of the efficiency of existing homes conducted by certified energy advisors, as well as (since late 2003) rebates for investments in efficiency measures that improve a home's EnerGuide rating. Green Communities organizations are among the few that have been given such certifications.

Today there are more than 25 Green Community organizations in Ontario in towns and cities that include a large majority of that province's population. There are also Green Community organizations in nearly every other Canadian province. Since 1996, these organizations have been organized under and served by a non-profit association known as the Green Communities Association. This association has four full-time staff. It coordinates information exchange between its members and facilitates delivery of several programs that are common across multiple local organizations.

Summary of Key Project Features

Purpose: Although the initial emphasis was on promoting energy efficiency (and that remains probably the biggest effort in most communities), the mission includes a

variety of environmental objectives including water efficiency, waste reduction, reduction in pesticide use, shoreline rehabilitation, tree planting, ground water protection through proper care of septic systems, sustainable transportation, and – in one town (Toronto) – renewable energy (in the form of a 700 kW wind turbine). The rationale underlying the initiative is that many environmental concerns can be most effectively addressed at the local level. Even for global issues such as climate change, local communities can play important roles in addressing their own contributions to the problems.

Scale: Green Communities organizations currently exist in a wide range of towns – from populations in the tens of thousands to a city (Toronto) of several million. Peterborough Green Up serves a town of about 70,000 people. Peterborough Green Up has a staff of 14, with approximately five of them devoted to the energy program. The program is providing approximately 500 initial home assessments annually, with about 40% of the homes getting a second assessment following installation of major efficiency measures. Data on total funding are not available.

Both because their environmental mandates are broad and because it will take a very long time to engage all or even most residents on these issues, they are considered on-going enterprises (with a number now in operation for more than a decade).

Scope: Although energy efficiency is the cornerstone, the project is tackling a broad range of environmental concerns. The principal focus of the initiative is the residential sector – whether for improving energy efficiency of homes, reducing waste, reducing pesticide use or other objectives. It is sometimes referred to as "home green up". In the arena of energy efficiency, the principal emphasis has been on home assessments and promoting improvements to the thermal envelop and HVAC system (principally to reduce space heating use). However, there have been some modest supplemental efforts to promote CFLs, hot water conservation measures and other measures.

The reinvigoration of electric DSM in Ontario over the past year offers additional opportunities for expanding efforts. Peterborough Green Up is expecting to work with its municipal electric utility to help locally implement a new federal EnerGuide for Small Business program that is currently under development.

Strategies: The core strategy of the initiative has been to develop and leverage partnerships with a variety of organizations. In most cases, the local municipal government has served as the "anchor partner". However, other important partnerships have been developed with utilities (and their demand-side management programs), the provincial government, the federal government, local schools, universities, other local non-profit organizations, local businesses and foundations. In general, the Green Communities that have been most successful have been those that have the broadest and strongest partnerships. In Ottowa, for example, the Green Community organization work so closely with the local municipal government that they operate out of the town's offices. In Peterborough, the local Green Community

organization's relationship with the town has been so institutionalized that they are involved in virtually every new idea for addressing an environmental issue in town. Indeed, they are actually doing some of the work the town would otherwise have to do itself. For example, they do education in the schools, they promote organic landscaping on behalf of the town, they distribute recycling bins to households, and they answer phone calls regarding environmental issues for the town. The municipal electric utility even has their "Peterborough Green Up" logo on its trucks.

With respect to energy efficiency, many began in the early to mid-1990s by providing free home energy assessments that included a blower door test. Following federal funding cuts, they made an important transition to a user-pay model in which consumers were asked to pay (e.g. $150) for the assessments. The local town government typically helped the organizations to market their services. Ontario's gas utilities also provided some assistance to some communities by both paying for the provision of hot water conservation measures (e.g. low flow showerheads) and promoting the service to their customers. Some municipal electric utilities also supported the efforts. The organizations themselves rely on community-based social marketing – gaining exposure through community-based events and meetings, gaining local media attention and promoting word-of-mouth referrals.[1]

In the late 1990s, the federal EnerGuide for Homes program was launched by Natural Resources Canada. The Green Community organizations became the dominant delivery vehicle for the program in Ontario, though they have recently begun to face competition from private sector providers. When first launched the EnerGuide program just had federal incentives to reduce the costs of the initial assessments. In late 2003, the federal government began providing additional funds to cover a portion of the costs of efficiency improvements. The incentive structure was developed in consultation with the Green Communities Association and is based on the number of "points" the home improves on the EnerGuide rating scale (between the initial assessment and a final inspection). It is generally designed to cover about 25% of the incremental cost of upgrades.

Resources

As noted above, resources are provided by a variety of partner organizations.

In Peterborough, for example, their $315 cost of a home assessment is covered by a combination of contributions. The home-owner pays $150, Natural Resources Canada pays $140 (plus an additional $140 for a second visit following major work), and the electric utility pays either $25 or $50 (depending on whether it is electrically heated). In addition, the city government and electric utility cover their administration costs

[1] The Green Communities Association provides additional information on how community-based social marketing works on its website (www.gca.ca). In particular, it makes available a masters thesis: Kennedy, Ryan D., "The Effectiveness of Local vs. National Marketing Initiatives for Home Energy Efficiency Evaluations: The Use of Social Marketing for the Residential Energy Efficiency Project in Waterloo Region", Waterloo, Ontario, Canada, 2000. This thesis concludes that "local delivery agents using community-based social marketing are more effective at getting the public involved in home energy efficiency evaluations" and that "The costs associated with this form of marketing are also significantly less".

(including the full-time manager and 0.4 FTE book-keeper). Marketing support is provided through a variety of sources including the municipal electric utility (e.g. through bill stuffers, customer referrals), Enbridge Gas, the city government and Home Depot.

The Home Depot support is particularly note-worthy. Following extensive outreach to the local store, the program manager has succeeded in persuading Home Depot to place EnerGuide and Peterborough Green Up marketing materials in its store and provide referrals to the program. They also raffle off $50 gift certificates to the store for customers who sign up for the program through the store. With the help of Peterborough Green Up, this relationship has now been copied by two other Green Community organizations (Kingston and Aurora) and is being explored by others. It has begun to lead to efforts to work with Home Depot's corporate headquarters.

Results

1. Evaluation

We are aware of a couple of evaluations. The first related to the relative effectiveness of community-based social marketing (see above) in Waterloo.

There were also a couple of evaluations of pilot programs – in Peterborough (March 2002) and Toronto (November 2003) – that tested the effect of offering financial incentives (on the order of 25% of incremental costs) for installation of efficiency measures. These tests were designed to inform the federal government on the role such incentives could play in helping Canada meet its Kyoto climate change treaty obligations. The evaluations were conducted by the Green Communities Association. They generally served their purpose as the pilot offers measures installation incentives were eventually incorporated into and are currently still offered by the national EnerGuide program. Key findings from evaluation of these two pilot programs are as follows:

- Conversion rates from initial assessments to installation of recommended measures were much higher in Peterborough (close to 50%) than in Toronto (less than 15%). The reasons for this large difference are not entirely clear, though it has been speculated that the Peterborough auditors had better "sales" skills.
- Average heating energy savings per home that installed recommended measures were between 30% and 35% in both towns.
- Savings potential was higher in Toronto homes (lower initial energy ratings, higher air leakage rates), but even among those homes installing efficiency measures Peterborough homes captured a greater percentage of achievable savings – hence, the end result that total savings percentage was about the same in the two towns.
- The average measure costs in both towns was a little more than $3000 (with the rebates averaging about $800).

2. Quantitative – Cost-effectiveness, energy savings, other

There are fairly extensive data on participation rates in different communities. In Peterborough, approximately 25% of the housing stock has now been visited. Between 40% and 50% of all homes now visited are following up on recommendations for major efficiency measures. Those that follow up are projected to realize an average of 30% to 35% reduction in space heating energy use (based on the difference between pre-treatment and post-treatment site assessments and EnerGuide ratings).

However, it should be noted that the conversion rate – from initial assessments to installation of major efficiency measures – was much lower (perhaps on the order of 10%) prior to the advent of additional federal rebates (about 25% of incremental cost) for actual measure installations. On the other hand, the Green Communities believe they are somewhat constrained by federal rules that prevent those providing home assessments from doing any of the improvement work or even helping customers select a contractor (with of which would remove an important hassle/transaction cost barrier for consumers).

3. Qualitative – other outcomes, press coverage, political impacts, market changes

As noted above, a number of Green Community organizations have been enormously successful in institutionalizing themselves as part of the social fabric of their communities.

4. Barriers – problem areas, limitations of results, what used up resources/time

Green Communities representatives believe that their model should be replicable. The key is developing a community of volunteers willing to put effort into starting up a non-profit organization and then developing relationships with local government, businesses, etc. One potential limitation of the results is that the energy efficiency program is currently relying heavily on the federally subsidized EnerGuide for House initiative. A substitute would likely be needed to achieve similar levels of success in Oregon or other areas outside of Canada.

Keys to Success/Lessons Learned

There are a number of key conclusions one could draw from the Ontario experience regarding keys to success and important lessons. Chief among these are:

- This is a social movement of sorts, with very long term goals that require a sustained effort for a decade or more. As such, the creation of local non-profit organizations intimately familiar with their community is critical. That, in turn, requires intensely committed local volunteers to get started.
- Once a committed group of local volunteers exists, seed funding to help them develop an organization structure is very important.

- Once formed those organizations will survive without general funding only if they are successful in developing partnerships with their town government and a wide range of other organizations (from which funding can be obtained).
- Diversification is also critical. The broad focus of Green Communities on a range of environmental concerns (of which energy efficiency is but one), helped attract a range of volunteers to forming the organizations, helped diversify funding sources by broadening the range of external organizations which could be partners, and helped make the most effective programs more institutionalized and better recognized within their communities (which helps all their programs).
- With respect to energy, the ability to access other program dollars (e.g. the federal EnerGuide program subsidies and utility DSM program dollars) has been very important.
- Once several successful community efforts are launched, there is a "snowball effect" in which others in other communities are spawned. This is made easier if the communities are organized (as they are in Ontario) to facilitate information exchange and help each other learn from failures and successes. For example, the Peterborough success in recruiting Home Depot as a partner has been replicated in a couple of other towns in large part because the Peterborough program manager has helped those other towns work through the process.

ODDA Resource Teams Plus Energy

Oregon Downtown Development Association / BetterBricks
Multiple Projects in Rural Oregon

Description: **A series of pilot efforts to integrate energy efficiency into short-term, focused community efforts to revitalize rural business districts.**

Key Project Features:

1. **Purpose:** The Oregon Downtown Development Association (ODDA) assists communities in developing local leadership and capacity to manage and fund comprehensive downtown revitalization efforts. The Resource Team approach is an on-site, two to three day focused community effort led by a team of downtown specialists in the areas of business development, public space design, and business space and facade design. The team assesses local strengths, weaknesses, opportunities and threats, and works interactively with the community. The goal of the process is to engage a community, gather information, determine local capacity, and assist in defining a future vision for the downtown. The final product delivered to the client is a Conceptual Downtown Plan that articulates the community's vision and provides strategies and steps to realize that vision.

   For a series of projects, the BetterBricks initiative of the Northwest Energy Efficiency Alliance added an energy expert to the existing downtown development team and process. That person reviewed energy savings opportunities at both the macro level (community) and micro level (individual businesses) to determine how energy efficiency and renewable energy development might impact the economic health of the community.

2. **Selection:** Communities request a resource team visit from ODDA. The applicant can be a local government or a business association. The applicant must provide some level of matching funds, typically $1,000 to $3,000. Requests have grown from 3 in the program's first year (1999) to about 20 annual requests currently. ODDA attempts to meet all requests, but is limited by availability of funding, and must postpone services to some communities. Communities served by the ODDA Resource Team with the BetterBricks Advisor included Arlington, Tillamook, Astoria, Fossil, Medford (lighting workshop only), Grants Pass (lighting workshop only), Prineville, The Dalles, Klamath Falls, and Warm Springs.

3. **Scale:** The communities served range from towns of less than 1,000 residents to small cities such as Astoria and Klamath Falls. The focus is on downtown business district, but also includes surrounding community space and buildings. The Resource Team visit is only 2 to 3 days, but is preceded by organizational meetings and information gathering. Development of funding and implementation of the concepts developed in the plan typically continue for multiple years. ODDA provides tools, training, and technical assistance to help communities secure funding and implement their plan.

4. **Scope:** Downtown projects encompass small business, government buildings, public space, and community infrastructure related to transportation. The energy efficiency and renewable energy aspects of the projects included these areas but typically expanded beyond them to uncover additional economic benefits to the community. The review of businesses focused on improvements to retail lighting (both from an energy and sales perspective), but also covered daylighting potential (rediscovery), glare/overheating mitigation, potential upgrades to building shell and mechanical equipment, and enhancements to local business product lines to carry more efficient products. Public infrastructure projects might include street lighting, public building lighting and efficiency, and pedestrian friendly exterior lighting. Renewable energy reviews provided an initial look at the potential of broader community resources, ranging from methane production (from dairy farm waste in Tillamook County and the landfill in Arlington), to wind resource, geothermal utilization, wood biomass, and enhanced solar utilization.

5. **Strategies:** Initial marketing and organization is provided by the sponsoring organization, i.e. the local government or the business association. During the on-site visit, Resource Team members start with a kick off meeting, go door-to-door to meet with businesses individually, and conclude with a community presentation of key findings and concepts. A final written report is delivered within 30 days.

   ODDA offers a variety of follow-up services through workshops, conferences, and technical assistance. For example, ODDA can provide information on how to apply for, or develop, sources of funding for larger projects. Follow-up on the energy-related pilots was more limited. The energy resource team member provided linkages to Energy Trust and/or utility resources and state tax credits. In a number of communities, there were workshops on retail lighting upgrades, as this was a common area needing improvement. As the energy aspects of the Resource Team were really pilots to determine the potential of integrating energy efficiency into the projects, there was not a ready infrastructure to provide ongoing support to energy projects beyond existing programs.

Resources

The cost of an ODDA Resource Team is approximately $25,000 per community. This includes the consultant team's time in the community through the development of the

Conceptual Downtown Plan, as well as the report writing following the on-site work. The community provides limited cost sharing and initial organizational development and marketing. Costs of implementation are born by the community, in conjunction with available resources from state and federal agencies, grants, and locally initiated funding mechanisms.

The cost of the energy expert was $3,000 to $5,000 per community, covering similar services. The most common incentives used were Energy Trust or utility incentives for commercial lighting.

Management
ODDA provides project management for the downtown Resource Team process. They work with state agencies and the communities, themselves, to select the communities to receive services, coordinate project development, identify and manage the consultant teams, and produce the final report. The process is well established and repeatable, although the end product is designed and tailored to meet local needs.

Results

1. **Evaluation** A formal process evaluation of the ODDA Resource Team approach was completed in June 2003. This evaluation did not include much information on energy savings, as only one community with the BetterBricks Advisor addition was included in the evaluation. Major findings of the evaluation included; 40% of the 22 respondent communities stated that ODDA services were *critical* to helping them achieve downtown revitalization goals; 73% of communities believed that ODDA could continue to help them in their efforts; 55% of communities characterized ODDA services as "excellent, would recommend them unconditionally".

2. **Quantitative** Most small businesses and government buildings reviewed in the program had potential lighting savings of between 30% and 70%, with paybacks after utility or Energy Trust incentives typically of 2 years or less. Other excellent savings potential was also routinely identified. However, continued informal follow-up by the BetterBricks Advisor indicates that fewer than 50% of the businesses that received lighting recommendations have implemented them, and he has cited a number of barriers and suggestions that should be considered in any community project aimed at small businesses. The ODDA evaluation found that some businesses had implemented or were planning to implement daylighting recommendations. Several community scale projects received a boost from the ODDA efforts and have moved forward. These include a methane digester in Tillamook and the conversion of a school in Fossil to a daylighted, naturally ventilated paleontology center. Other community scale projects were identified, but they are likely not being pursued due to a lack of expertise and financial resources.

3. **Qualitative:** In general, it appears that communities, businesses, and the ODDA found the addition of the energy advisor to the Resource Teams to be valuable. Specific qualitative benefits include:

    - The pilot energy projects did succeed in reaching small businesses in rural communities, one of the most difficult to reach markets in the energy efficiency field.
    - The energy pilots added an element of sustainability to the ODDA approach by identifying energy efficiency and renewable energy development possibilities within the communities.
    - The larger context of economic development and community revitalization added push to the energy related recommendations, although barriers to the adoption of the recommendations are still substantial.
    - The network, respect, and community insights developed by ODDA over multiple years made getting an energy efficiency message to community and business leaders a simple task.
    - Public relations, local media, and community interest in energy efficiency were very strong during the resource team visits.

4. **Barriers:** The barriers to energy efficiency and renewable energy development noted in the ODDA Resource Team communities are very substantial, although not atypical of small business and rural community barriers noted in other efforts. Major barriers include:
    - Limited financial resources available to small business to undertake retrofit projects.
    - Lack of energy efficient product and service availability within the community.
    - Lack of time and interest on the part of local electricians. Typically, small town electricians are booked well into the future, and a concentrated effort to secure simple efficiency measures does not fit their business priorities.
    - As a pilot, there were limited follow-up tools available, especially on larger (community scale) projects where more planning and analysis would be required.

Success Factors

For a very modest amount of time and effort, hard to reach rural communities did achieve increased energy efficiency and new awareness about the benefits of energy efficiency and renewable energy in their communities. Key success factor included:

- Reliance on the established network and defined service offerings of ODDA.
- Emphasis on the business and efficiency benefits of improved retail lighting.
- Opportunity to look at broader energy-related community issues through the engaging focus of community revitalization.
- Serving communities at their request, with cost-sharing used as a proxy for the demonstration of community interest.

Lessons Learned

Linking with ODDA (or similar organizations) is an excellent way to gain access to business and community leaders. Use established networks and respected service providers to get community interest.

Typically, small businesses have neither the interest nor the resources to undertake energy efficiency retrofits. In this project, interest was not a problem due to the linkage to business development, but money was still an issue. Small businesses will likely need more time to assemble the financial resources, or alternative financing, to complete retrofit activities. Also, local electricians are not interested in a sudden "burst" of new work. Thus, more time and more follow-up activities may be needed to finally close the deals. A creative alternative may be to price retrofits through an outside vendor, and offer local electricians an opportunity to price match if they are interested.

Many rural communities have some type of local energy resource that could be developed. These include various waste-to-energy options, biomass, pv, wind, and small hydro. There is not an established system for bringing these resources on-line. A multiple step assessment/feasibility/technical assistance route could be developed, followed by links to public and/or private partners for financing.

Linking to small business and economic development through an integrated approach such as an ODDA Resource Team is an excellent way to secure local leadership interest in, and support of, energy efficiency and renewable energy initiatives and projects. This approach could likely be tied to broader community efforts that reach beyond the downtown business community.

Comprehensive Demand-Side Management Program

Osage Municipal Utility
Osage, Iowa

Project Description: **A long-term, low-cost municipal utility effort that ingrained energy efficiency into a community, and realized major economic benefits**.

Summary of Key Project Features:

Project Purpose: The Osage Municipal Utility's Comprehensive Demand-Side Management program was a response to rising oil prices in 1974. The General Manager of the utility, Wes Birdsall, believed that the embargo showed that fuel prices could not be guaranteed, and availability and price volatility could impact customers' rates. In addition, utility customer demand was growing at a rate of 7.2% per year in 1973. Within a decade, Osage Municipal Utility (OMU) would need to invest in new generating capacity.

The management of OMU decided that the best strategy to address these issues was a comprehensive demand-side management (DSM) program beginning with a two year public education campaign about the benefits of energy efficiency.

Community Selection: The project was created by the progressive vision of OMU General Manager Wes Birdsall, who felt that unpredictable fuel prices and load growth would have a negative impact on the community of Osage.

Scale: Osage is a small city in Iowa located half-way between Des Moines and Minneapolis. Its population is 3,500. The municipal utility provides electric and gas services to residences and businesses. The utility serves 2,100 electric meters and 1,600 gas meters in the community. The demand-side management program operated for over 18 years, beginning in 1974 with program activities continuing through 1992. The total 18 year expenditure by OMU was less than $500,000.

Expenditures by program area are shown in the table below.

Program Area	DSM Expenditures
Gas DSM	$91,600
Electric DSM	$118,400
Load Management	$266,500
Total	**$476,500**

Note: Expenditures are estimates

Scope of Project
The Osage Municipal Utility DSM program targeted the residential, commercial, and industrial sectors with gas and electric efficiency measures, and load management strategies.

Program Strategies
Given the 18+ years of implementation, there have been a variety of program strategies employed in Osage. A list of the different type of program activities grouped by heading is presented below. The focus is on type not necessarily chronological order of program roll-out and implementation.

Education

- During 1974-1980 various ads and articles were placed in local news media focusing on the wise energy use
- Beginning in 1980 a free monthly newsletter with information on energy efficiency practices and products, and showcasing local energy efficiency projects/achievements was sent directly to all customers
- OMU General Manager Wes Birdsall provided talks to community groups on the benefits of energy efficiency and load management
- Support and direct involvement in energy education in schools began in 1986 with teacher support (power plant tours, energy efficiency instruction and literature, etc.) and energy fairs

Information Assistance (No Cost to Customers)

- Lending of electric end-use meters to locate inefficient appliances
- Aerial thermograms (infrared scans) were taken of all homes and businesses to illustrate heat loss through roofs
- Infrared scanning of building corners were completed on all buildings to show heat loss through walls; scans were made available to customers by mail or through pick-up (with an interpretation of the scan and a discussion on how to minimize heat loss)
- Energy checks of homes and businesses with blower doors and hand-held infrared scanners (indoor walls) to show the need for weatherization, air sealing, or to check the effectiveness of insulation work; over 50% of homes and business had scans of interior walls
- Complete energy audits of industrial facilities by consulting engineers – 100% participation

New Construction Standards

- In 1975, OMU required minimum insulation standards to be met for all new gas or electric heat customers - residential and commercial – R-14

walls and R-24 ceiling, common practice became R-19 to R-24 walls and R-40 to R-60 ceilings

Rebates and Giveaways

- In 1987 and 1988 low-income customer weatherization was completed by Jaycee volunteers; OMU provided the materials free of charge
- Water heater jackets were given away since 1988 – 98% of water heaters are wrapped
- Low-flow showerheads were provided free to households with a limit of 2; faucet aerators were also distributed to customers – over 70% saturation rate
- CFL rebates began in 1989 – rebate coupon redeemable at local hardware stores
- Tree planting to reduce air conditioning load began in 1975 – trees were donated by a local nursery and a hydraulic tree planter could be leased by customers
- OMU in 1988 offered to pay 2 years interest on a loan (OMU pay 50% and Iowa Dept. of Natural Resources pay 50%) for businesses making energy efficiency improvements – less than 10% participation rate

Utility System Improvements

- Infrared hand-held scanners were used on the utility distribution system to detect faulty electrical connectors, that cause line loss; repairing connectors and replacing wires resulted in diminishing line losses by approximately 75%

Street Lighting Retrofits

- All street lights in Osage were changed to high-pressure sodium in 1981 and 1982

Load Management

- In an effort to reduce peak load by 9-10% in 1979, a radio controlled switch turned off residential and commercial air conditioners (central and large room a/c) and water heaters for up to 7 ½ minutes every half hour; 96% voluntary participation for air conditioners and 75% for water heaters – participants received a free water heater wrap or 2 CFLs

Resources: OMU estimated dollars spent over the 18 years of the DSM program was approximately $500,000. The only outside program consultants were for industrial audits. OMU staff were answering customer DSM program

questions and delivering efficiency and load management services, along with their regular utility duties.

Additional grant money came from the U.S. Department of Energy and the State of Iowa for the load management pilot project ($250,000), and the Iowa Department of Natural Resources for work with industrial customers.

Management: The General Manager, Wes Birdsall, was responsible for managing the DSM initiatives at OMU. All programs and expenditures required approval of the OMU Board of Trustees. As mentioned above, the DSM program services were part of all OMU employee job responsibilities.

Results

Evaluation

There has been no systematic evaluation of the Osage Municipal Utility DSM program. OMU monitored the number of homes that receive free products and tracked the number of customers participating in load management programs. The key metric for OMU is reducing peak demand growth and customer's bills.

Quantitative Results

- Since 1983, electric rates for OMU customers has decreased 19%, offsetting a 20% rate increase from its wholesale supplier
- Average electric bills in Osage were 58% lower than rates of Iowa's investor-owned utilities
- OMU customers saved $486,000 in 1991 from reduced electric and gas rates
- Estimates of overall average savings for electric and gas are 25%; saving the community $1,000,000 per year.
- In Osage, 82% of money spent on natural gas and 53% of money spent on electricity leaves the state.
- Savings from 1979-1991 for electric (all sectors) totaled over 92 million kWh, gas savings were 8 million therms.
- Peak demand growth has been held to less than 3% per year since 1976, which delayed the need for new capacity until after 2000
- Electric load growth was zero from 1977-1984; it increased 26% overall from 1985-1989 due to 48% load growth in the industrial sector;
- Deferring construction of new capacity saved OMU $200,000 per year
- OMU DSM delayed construction of 4 MW of capacity for about 12-15 years, an avoided capital cost of $2,000,000
- Cost per kWh saved is between .07 and .21 cents compared to a purchase rate of 2.8 cents/kWh and sales rate of 4.99 cents/kWh; cost per therm saved is about 1 cent compared to a purchase rate of 39.7 cents/therm
- Economic development – four plant expansions and a new plant was built in Osage since the early 1980's, partly due to low electric rates

and an active and productive community; reducing energy costs made the Fox River Mills more competitive as costs for a dozen socks dropped from 48 cents to 34 cents, leading to more orders, plant expansion, and hiring 300 new employees

Qualitative Results

- Transforming the community to a conservation ethic with a long term program that created peak and energy savings, customer bill reductions, environmental quality, and economic development in the community
- Osage became a national and international symbol for a successful approach to energy efficiency initiatives; numerous national/international newspaper and magazine articles, speaking engagements, visitors in Osage to learn about program approach , etc.
- Changed the stocking practices of the local hardware store – more energy efficiency products were available to customers

Project Barriers/Challenges

- Convincing community residents that energy efficiency and load management can bring tangible benefits to the community and keep the utility financially healthy
- Training OMU staff to incorporate energy efficiency in their daily jobs, when utilities have focused on increasing electric and gas sales

Success Factors

- Success is directly tied to Wes Birdsall's leadership in tackling supply issues by defining a unique path that incorporated demand-side management into utility services with support from the community.
- Community energy efficiency education for the first two program years created long-term benefits for the community; education was largely responsible for community support and DSM program success**.**
- Municipal utilities have advantages over investor-owned utilities regarding the implementation of energy efficiency programs. Because OMU is "owned by the community" and has oversight with an elected Board of Trustees, it can make decisions that relate to its fiscal responsibility and provide social benefits without the outside influence of regulatory bodies and investors

Lessons Learned

- Long-term and well conceived demand-side management can be an asset to a utility in managing supply and maintaining the financial health of the community.
- Integrating demand-side management into the job functions of all OMU employees made the program become a core service and function of the utility
- DSM is larger than energy and dollar savings; added benefits include job creation, economic development, and environmental stewardship
- Osage proved that communities and their residents and businesses are willing to adopt DSM as a core value of their utility and community, when benefits are real and visible over a period of time

Community Energy Cooperative

Center for Neighborhood Technology & Commonwealth Edison
Chicago, Illinois

Description: **An urban model of neighborhood empowerment within new energy markets.**

Key Project Features:

Purpose: The Community Energy Cooperative was founded in Chicago in January 2000, as collaboration between the non-profit organization, the Center for Neighborhood Technology (CNT), and the local investor owned utility, Commonwealth Edison (ComEd). The Cooperative's Mission was as follows:

The Community Energy Cooperative will promote community development by:

- Improving neighborhood electrical reliability;
- Reducing costs of energy services; and
- Permitting community participation in the new markets created by industry restructuring.

The Cooperative will accomplish this through:

- Development of community based energy efficiency, load management and generation strategies;
- Cooperation with existing community organizations; and
- Aggregation of community purchasing power.[2]

This agreement was a substantial accomplishment that came out of several years of hard work. CNT had been involved in community energy work since its earliest days in the 1970s, providing energy audits for homes and businesses, advocating for a better franchise agreement between the city of Chicago and ComEd, and introducing energy efficiency measures to communities throughout Chicago. At many times in the past, CNT and ComEd had been policy adversaries.

The discussions that led to the creation of the Cooperative gained momentum in the summer of 1999 when prolonged summer heat caused the catastrophic failure of substation switches in the Chicago's central area plunging the downtown "Loop" and several neighborhoods into blackout. In the ensuing weeks, it became clear that ComEd had deferred distribution system investments mandated by the city's Franchise Agreement, and an angry Mayor and City Council demanded accountability. The hot summer of 1999 also caused the wholesale price of electricity to skyrocket. For a few hours in late July, prices went from 3¢/kWh to

[2] Memorandum of Agreement between the Center For Neigborhood Technology and ComEd.. 1/3/00

$7/kwh. ComEd was locked into the bundled prices of the "rate relief" portion of the 1997 restructuring act, however, and could not pass these costs on to customers. The Cooperative offered the opportunity of a pilot project to address infrastructure needs and contain costs by reducing stress on the system in targeted areas and shaving peak demand. Although ComEd had its own industrial curtailment program, the Cooperative hoped to concentrate the benefits of curtailment on particular substations, something that had not been tried.

As the Cooperative was being formed, deregulation was on the minds of all involved. The Cooperative was intended to allow communities to participate in new energy markets by being more efficient users of electricity, by giving them the means by which to aggregate, and by offering ways to partner with the system to increase reliability and contain overall costs. For the utility, the Cooperative was seen as a way to experiment with new business models to account for developments in generation, district cooling, load shifting, distributed generation, and deregulation. This vision has evolved, in part because deregulation in Illinois was put off in response to the California energy crisis, but also because ComEd's business strategies changed after its parent company Unicom merged with PECO in Pennsylvania to become Excelon. The Cooperative's work changed as well—its main project is now exploring how to create demand response through a real time pricing program, the Energy Smart Pricing Program (ESPP), which launched in late 2002. This case study will focus on the Cooperative's place-based demand reduction work during the years 2000-2002.

Selection: The Cooperative evaluated possible community sites for the pilot projects using data supplied by ComEd. Compiling information on over 5,000 feeders, CNT used GIS mapping to find the communities that met certain reliability, load and demographic criteria. After the Loop blackout, these criteria changed to focus on substation areas threatened by age and capacity problems but not yet scheduled for upgrades. Seventy-three threatened substations existed in the region. From these, ten existing communities—five in the city, five suburbs—were chosen as possible sites for initial pilot projects. Additional research evaluated the social capital of these communities, for the Cooperative planned to partner with local leaders and existing community organizations to facilitate outreach.3 Finally, the Cooperative wanted a diverse set of old, new, urban, and suburban communities for its experiment in the hopes of determining what mixture of products and services would be appropriate for each community model for replication purposes.

This selection process resulted in the Cooperative focusing its work in four communities:

- **Pilsen and Little Village neighborhoods of Chicago.** The Cooperative opened its first office in this urban neighborhood with a large Mexican-

[3] "Putting the Community into the Community Energy Cooperative", 5/00

American population just southwest of Chicago's downtown in the summer of 2000.

- **Northwest side of Chicago**. Rather than using neighborhood boundaries, this Cooperative community was defined by the area served by three Northwest side electrical substations and their feeders. Most of this area is composed of single-family homes, primarily older bungalows without central air conditioning. Residents were contacted through a direct marketing campaign, focusing on only those homes attached to the designated feeders.

- **Elgin, Illinois.** Elgin is a diverse and complex city, which has become a suburb of Chicago as the metro area has grown. Elgin has older, historic neighborhoods as well as new subdivisions and a strong network of community organizations. Elgin is also home to many kinds of large commercial, industrial and small businesses, which could benefit from innovative demand reduction opportunities.

- **Park Forest, IL.** Park Forest is a unique Chicago suburb with over 50 percent of its housing cooperatively owned. The existing social infrastructure and history of activism in Park Forest made it very supportive of the Energy Cooperative's work and made this a relatively easy community in which to do outreach.

Scale

Cooperative Communities and Membership			
Community	Households	Cooperative Members	Cooperative Penetration Rate
Pilsen	30,932	2,530	8.2%
Park Forest	7,715	769	10.0%
Northwest Side	71,242	1,386	1.9%
Elgin	26,567	706	2.7%

The Cooperative launched in January 2000 and is still operating. The projects described in most detail here ran from 2000 through 2001.

The Cooperative received start up funding from Commonwealth Edison in the amount of $14.7 million over 5 years. In addition, the Cooperative received a negawatt payment of $150kW4 for its demand reduction programs in 2000 and 2001. A portion of this negawatt payment was set aside to create a Community Benefits Fund that provided small grants for community projects. The grantees of

[4] The value of a Negawatt for the program was determined to be $200 per kW of demand reduction, of which the utility kept $50.

the Community Benefits Fund were chosen by community representatives. Additional grant funds from the Illinois Commerce Commission, the Illinois Department of Commerce and Community Affairs, and the City of Chicago were used for specific projects.

Scope: The Cooperative had 7,000 members in its first two years. Members included households, large and small businesses and industries, and municipalities.

Strategies: In its first few years, the Cooperative residential energy saving strategies focused on efficiency projects such as refrigerator and air conditioner trade-ins and CFL giveaways. In the winter of 2001-2002 the Cooperative partnered with the City of Chicago to offer a natural gas price protection plan for households, which combined the use of financial tools to mitigate increases in the price of natural gas with workshops for participants on conservation and efficiency. Beginning in January 2003, the Cooperative launched its Energy Smart Pricing Program (ESPP) a day-ahead real time electricity pricing program.

One of the key Cooperative strategies was partnership with community organizations, local leaders and government agencies. Partnerships led to increased membership, additional funding and program expansion, and publicity.

In the Pilsen neighborhood the Cooperative opened a storefront office on a main street, which provided a lot of visibility in the neighborhood. The Cooperative's bilingual organizing staff set up booths at every neighborhood fair and gave presentations at community group meetings. The free youth computer center in the Pilsen office was a good way to get community members to visit the office. The Cooperative also went door-to-door in Pilsen with its air conditioning trade in program. In other neighborhoods the Cooperative used direct mail to outreach to members.

One of the most innovative incentives the Cooperative offered was a Community Benefits Fund. A portion of negawatt payments was put aside and regranted to community projects chosen by community representatives. The Community Benefits Fund grants totaled over $250,000 and went to projects such as solar lighting for a community garden, community arts, health care, and job training.

The Cooperative hired a market research firm to help it build an understanding of the relationship between consumers and the energy they use as it was designing its programs and outreach methods. Not surprisingly, the research found that consumers largely see energy issues as confusing and generally only think about energy when service is interrupted. Moreover, few customers found the small monthly savings generated by efficiency or conservation sufficient incentive for action. The Community Benefits Fund provided a tool to confront these problems; it gave the Cooperative an additional means of demonstrating the cumulative impact of many small demand reduction actions and also gave community

members another incentive for action—by reducing energy use they would be funding community improvements.

The negawatt payments allowed the Cooperative to provide households and substantial rebates for appliances, CFLs, and other efficiency equipment. Households received an energy kit when they joined the Cooperative (membership cost $10 per household). The kit contained three CFLs and a set of information cards on energy efficiency and demand reduction strategies for the home.

Non-residential customers participating in the Cooperative's curtailment program received a payment for on-call demand reduction. There was one call for load reduction in each year of operation.

The Cooperative communicated with members through a website (www.energycooperative.org), newsletters, and workshops on energy efficiency.

The Cooperative had engineers on staff, which allowed it to provide its commercial, industrial and municipal customers with custom demand reduction solutions suited to their specific energy needs. Cooperative engineers explored a diverse set of technologies including fuel switching of back up generation, fuel cells, solar power, and thermal storage. Many of these technologies have been implemented as demonstration projects at the office space shared by CNT and the Cooperative headquarters.

Resources

CNT and ComEd founded the Cooperative as a partnership. CNT brought over 20 years experience as a nonprofit community organization to the partnership. The Cooperative used CNT's nonprofit status until it had its own. Many of the Cooperative's staff members came from CNT staff and board or through CNT connections. The Cooperative and CNT share office space to this day. ComEd provided startup funds, negawatt payments, and technical expertise. ComEd also provided electrical system data that played a large role in community selection.

Over time, other partners added resources to the project:

- **The City of Chicago Department of the Environment** provided a grant that purchased air conditioners and enabled the Cooperative to provide EnergyNet's custom school energy curriculum to Pilsen schools. The City's grant also bought the computers for the computer lab. A later city grant funded a natural gas price protection and conservation education pilot program during the winter of 2001/2002.
- A grant from DCCA, the **State of Illinois Department of Commerce and Community Affairs**, now the IL Department of Commerce and Economic Opportunity helped the Cooperative buy refrigerators and provided the Energy Efficiency Kits given to all members. DCCA also provided written materials about energy and energy use for distribution at festivals and at the Pilsen office.

- Funding from the **Illinois Clean Energy Community Foundation** and the **Customer Assistance Fund** allowed the Cooperative to research expansion models and the potential of real time pricing.
- The Cooperative worked with **Chicago Solar Partnership** to install photovoltaic (PV) power systems, including a system for Casa Aztlan, a Cooperative member in Pilsen.
- In Pilsen, eight community organizations and churches served as window AC distribution centers. Both parties benefited from these partnerships. Cooperative members acquired their air conditioners and the community groups received some needed funds for their work.

Results

1. **Evaluation**

The Cooperative had conducted several evaluations of programs. In 2001, it hired TecMRKT Works and RLW Analytics to conduct a program evaluation, a market assessment, and an impact evaluation. Key findings included:

Residential Programs

- Participants were very satisfied with the Cooperative and the air conditioner exchange programs.
- Participants recommended Cooperative membership to friends and relatives.
- There was substantial awareness of the air conditioner programs among non-participants within the targeted communities.
- The Cooperative's energy kits and educational materials increased the energy impacts.
- Interest in energy-related products and services was higher among participants.
- The more community-based the approach the more likely customers are to join the Cooperative.
- Most of the air conditioner installations were self-installed and judged by the on-site engineers to be well installed and functional.

Commercial and Industrial Programs

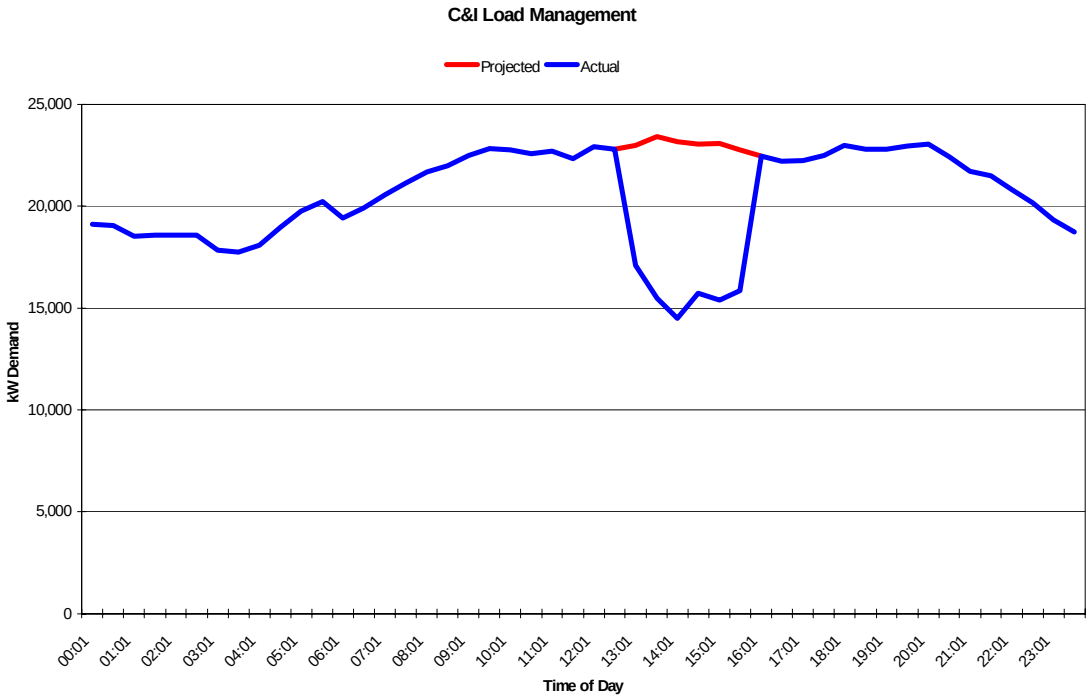
- Participants were fully engaged in the program
- All knew that there was a summer curtailment
- Most customers indicated they took action during the curtailment
- Half of the customers could make some estimate of the amount of load curtailed.
- Nearly all customers (97%) would recommend the program to other business associates.
- Advanced notification and subsequent follow-up was extremely important to customers.
- Real-time monitoring was very important to about 50% of the participants.

2. **Quantitative Results**

Cost-effectiveness, energy savings, other By aggregating members who could share in the value of reduced demand, the Cooperative reduced peak energy demand via numerous efficiency incentive programs. For example, the Cooperative made possible the replacement of 5,500 inefficient air conditioners with new EnergyStar® models in its first year, collectively saving members approximately $140,000 in energy bills per year. The Cooperative also replaced 800 central air conditioners and provided rebates for more than 70 business and municipal lighting upgrades. In total, first year load reduction programs reduced electric demand by more than six Megawatts.

Long-term kW Reduction Performance			
Program	**2001 kW Reduction Goal**	**Performance through 12/31/2001**	**Percent of Goal**
Window Air Conditioner Exchange	3,500	3,780	108%
Central Air Conditioner Exchange	800	1,281.595	160.2%
Commercial Lighting Retrofit Program	3,000	2,048.287	68.3%
Demonstration Projects	2,200	30	1.4%
Total	**9,500**	**7139.882**	**75.2%**

Larger members voluntarily curtailed almost 17 MegaWatts of power on demand, as shown in the chart below.



3. Qualitative

The Cooperative received, and continues to receive, a great deal of positive press coverage on its work including a "Best in its class for 2001" award from the Peak Load Management Association.

The key barrier the Cooperative faced was the lack of transparency in the energy market. The process of establishing a negawatt value for Cooperative programs was extremely difficult. Navigant consulting modeled the benefit of the Cooperative programs to the utility and generated estimated values in the range of less than $100 per kW-year to more than $500 per kW-year. While a fee for the Cooperative's work was eventually agreed to on a pilot basis, this wide range of values made it difficult to make a business case for the Cooperative's work.

In recent years, the Cooperative has achieved a degree of market transparency with its hourly electricity pricing program for residential customers, and customers are responding to the market signals this program provides. But true transparency for all segments of the industry would allow the greater value capture for demand reductions and alternative generation through place-based targeting of programs. In addition, the various changes in deregulation plans in Illinois made it hard to plan long term strategic programs, as the incentives for participating parties continued to change.

There was some trial and error in designing the energy efficiency programs over time. For example, the refrigerator trade-in program began with the Cooperative buying

refrigerators in bulk, but later transitioned to the Cooperative offering rebates through area appliance retailers and facilitating old appliance pickup and recycling. This program change allowed the Cooperative to take advantage of the existing bulk purchase and inventory storage systems of retailers while increasing outreach for the program though this new distribution channel. An ongoing challenge was that for many people, appliances are only replaced when they die, and then the need for a new one is urgent, which precludes good decision making. This may mean that incentives have to be particularly attractive to get consumers to replace still functioning appliances.

One major barrier the Cooperative faced in trying to implement innovative onsite generation solutions was the gap between the experimental potential of such technology and its real world availability, cost, and success. For example, a long-planned pilot fuel cell program with EPRI was thwarted by the inability to obtain fuel cells. Similar problems were encountered with microturbines, though one was eventually installed.

Finally, while the Cooperative was successful in organizing load curtailment cooperatives, incenting mass replacements of air conditioners, and creating a community awareness of the need to peak demand reductions, the ongoing future of the project depended on externalities. From the blows to innovation in the energy industry (e.g., the California fiasco, the Enron mess and fuel cell as vaporware) to changing local circumstances (e.g., ComEd's merger with Peco, a series of unusually mild summers, economic slowdown reducing the growth of demand and allowing ComEd to catch up on undone infrastructure improvements) there was not a clear connection between implementing successful programs and their continuation. A long-term commitment may be a key driver for success for these type of programs, therefore. Only creative recasting of the Cooperative's work to focus on real-time pricing has allowed the Cooperative to regroup and to prosper under a different, but related business model after 2002.

Success Factors

A key success factor to this project has been partnership. The primary partnership between ComEd and CNT that formed the Cooperative allowed each organization to access tools and resources that each did not have on its own. Additional partnerships that were added as the project progressed allowed the project to reach thousands of energy users with energy efficiency information and products in a timely and efficient way.

Also important to the Cooperative has been the breadth and depth of its staff. With proficiencies in engineering, organizing, marketing, communications, project management, negotiations, and sales, the team was able to creatively meet the challenges it faced. Bilingual staff and outreach materials were also key to being able to reach community members.

Over time, the ongoing success of the Cooperative has been its flexibility and creativity. As the original vision of the Cooperative changed, the organization and its programs had to change with it. For example, the creation of the Energy Smart Pricing Program has been a major success for the Cooperative and its members, but required the creation of a new experimental electricity tariff and an information system for participants. The

Cooperative's engineers helped with the innovative energy systems that are allowing CNT headquarters to apply for Platinum LEED certification and have designed a cogeneration facility in Chicago that takes advantages of untapped efficiencies and assets. The Cooperative is also working with fast growing suburban Kane County, Illinois to help it plan for an energy future that includes renewables, efficiency and distributed generation to meet its needs.

Lessons Learned

- Both households and businesses in a community can achieve real reductions in demand through energy efficiency and curtailment programs, and these reductions can be targeted to reduce the cost of energy infrastructure needs.
- A Negawatt payment can be an important source of revenue for community energy programs, but determining the proper size of such a payment can be very difficult and can make or break a program.
- Partnership can bring vital resources and new networks of participants to energy programs. The partnership with ComEd gave the Cooperative access to financial and information resources that it did not have, while through CNT the Cooperative gained two decades of experience working in Chicago area communities.
- Different communities require different organizing strategies, while the Cooperative used classic community organizing techniques in the Pilsen neighborhood it used direct mail on the Northwest Side of Chicago.
- Energy market transparency is required to identify the true value of efficiency, demand reduction, on site generation, and other energy alternatives. For example, only if the system operator has good information on such place-based costs and is willing to share it, can the value of localized demand reduction be determined.
- The freeze on deregulation that was a fallout of the California energy crisis has made it difficult for community energy programs to plan strategically for the long term, so organizations should work to advance energy policy, and in the mean time, create multiyear agreements for their work to hedge against disruptive policy changes.
- A Community Benefits Fund created from energy savings offers a motivation for efficiency and demand reduction aside from environmental or energy bill benefits.

Davis Energy Efficiency Project

Davis Energy Task Force
Davis, California

Description: A non-utility operated DSM program developed to provide better service to hard to reach populations such as small businesses and rental properties.

Key Project Features:

Purpose In response to the California energy crisis, the City Council of Davis, California formed a Citizen's Task Force on Energy Efficiency in 2001 to,

> "[E]xplore opportunities to reduce the cost, improve the reliability, and enhance local control of the supply of electricity to its residents…[and] to find ways to help promote energy efficiency and conservation, and to promote the use of renewable energy sources."[5]

Selection: In 2001, the California Public Utilities Commission (CPUC) decided to allocate a portion of California's Public Goods Charge energy efficiency funding to local, non-utility run programs. The Davis Energy Task Force, along with Davis city staff, responded to the CPUC's request for proposals with a plan to create the Davis Energy Efficiency Project (DEEP)[6] and provide energy efficiency measures and information to businesses and residents in Davis. The proposal argued that California's standard utility-run energy efficiency programs were not reaching the population of Davis, a town with many small businesses and a large student renter population from the University of California at Davis. The Davis team planned an extensive outreach program along with direct rebates and technical assistance on efficiency measures that were designed for Davis's hot, dry climate. The city of Davis was awarded $1.9 million for the creation of the DEEP program, which began operating in October 2002.

Scale: Davis is located 11 miles West of Sacramento and has about 62,000 residents and many small businesses. Davis has a long history of innovative environmental efforts and a strong renewable energy program. Davis has a high proportion of renters, 58 percent, and has nearly 10,000 multifamily apartment units and 400 mobile homes.7

---

[5] City of Davis, Citizens Task Force on Energy Issues. "Final Report." January 2003. http://www.ci.davis.ca.us/story/pdfs/CTFEI-FinalReport.PDF

[6] The program was initially called the Davis Comprehensive Energy Efficiency Program (DCEEP).

[7] DEEP Proposal

DEEP ran from October 2002 to June 2004 with a budget of $1.9 million. The program was expanded to cover all of Yolo County in 2004, and the renamed Yolo Energy Efficiency Project (YEEP) received $1.97 million for efficiency measures and $1.2 million for information and market transformation efforts through 2005.

Scope: DEEP included measures aimed at single family and multifamily residential customers as well as commercial customers and schools as described in the table below. Renewables and distributed generation projects are not within the scope of projects paid for with PGC energy efficiency funds.

Davis Energy Efficiency Project 2002-2004 Program Offerings[8]		
Measure	**Units Delivered vs. Goal**	**Comments**
Davis Lights: Comprehensive Commercial Lighting Retrofit	171 / 120 Sites	This program was one of the most successful of DEEP offerings. Per kWh saved incentives were provided for lighting retrofits performed by approved contractors. DEEP staff performed inspections for quality control.
Customized Commercial Projects	74 / 35 Sites	Initially intended to focus on specific commercial needs such as refrigeration or HVAC, this program ended up mainly performing lighting retrofits like the Davis Lights program, because the short payback time and lack of building alterations required for lighting upgrades made them the most attractive to commercial tenants. Together, this program and Davis Lights generated 80 percent of the annual kWh saved and 62 percent of the kW saved by DEEP programs.
CFL Commercial	281 / 600 Lamps	DEEP initially considered commercial CFL give aways a separate measure, but they ended up going to those receiving the lighting retrofit.
Small Commercial Exit Sign	230 / 300 Fixtures	Program implementers suggested that this free direct install program for exit signs should be combined with the comprehensive lighting retrofit in the future.
City-School Partnership	3 / 4 Projects	This program provided cool roofs and lighting retrofits to schools. DEEP staff suggests that the lighting be included in the commercial lighting retrofits in the future.
Single Family and Multifamily Shadescreen Rebates	17,121 / 60,000 Sq. Ft.	The $1 per square foot shadescreen rebates for single and multifamily homes were part of the DEEP portfolio tailored to the hot Davis climate. The program underperformed because it initially overestimated potential shadescreen usage per single family home (200 sq. ft. versus an actual average of 79 sq. ft.) Also, the measure was marketed to multifamily building owners,

[8] City of Davis, Davis Energy Efficiency Project. "Final Project Report, October 2002 through June 2004." (Draft)

		but the split incentive on cooling expenses was a barrier to adoption. In the future the program may be marketed to tenants.
Single Family and Multifamily Duct Repair	549 / 400 Systems	The majority of the systems repaired were multifamily, where the rebate was $400 versus $200 for single family homes. The higher multifamily rebate was intended to overcome the split incentives for renters. Program worked best on electric heat systems, because combustion appliance safety tests are required for duct repairs on gas systems, which can drive the costs up significantly.
CFL Residential	9,900 / 9,900 Lamps	DEEP gave away 3 CFLs per household, and used the giveaways as a marketing tool at festivals and other events. But the program evaluation showed that on average only 2 of the 3 were installed, lowering the effectiveness of this measure. Program evaluators pointed out that in other programs discounted bulbs or give aways of fewer bulbs have better implementation rates.
Low Income Single Family Window-Mount Evaporative Cooler	100 / 100 Systems	DEEP staff worked with a manufacturer to make this window evaporative cooler for trailer homes in the area that had generally relied on substandard swamp coolers and window AC. The evaporative coolers were provided free of charge and no trade-in was required. The lack of trade-in reduced the overall realization rate of the program as residents surveyed continued to use other cooling sources. But, the program was a good demonstration of a technology that is now being adopted by other efficiency programs. The program was also very popular with city government and in the media because of its equity impacts.
Multi-Family Swimming Pool Pump Retrofit Project	2 / 5 Projects	This program was mainly a demonstration. DEEP originally included a single family pool program, as well but discontinued it because it was a duplication of a utility program available in the area.
Multifamily Cool Roof Project	0 / 20,000 Sq. Ft.	This program was not successful because the two year timeframe of the program was too short to accommodate the long lead times needed. Moreover, the split incentive between renters and building owners was large and the rebate level of $0.20 per square foot was too low given the incremental cost of cool roofs.
Multifamily Laundry Retrofit Project	64 / 60 Machines	DEEP offered a $200 rebate for washers in multifamily buildings. In addition they marketed rebates for multifamily and single family washers available from the Davis Water Conservation Program.
Torchiere Swap	297 / 100 Fixtures	This was a popular measure; only one event was initially scheduled, but a second was added based on the turnout.
Single Family and Multifamily HVAC Charge and Airflow	355 / 1000 Systems	This measure was offered free of charge, but was not overly popular.

Strategies: DEEP pursued a number of marketing and outreach strategies. According to the program evaluation, most participants surveyed found out about the program through newspaper advertisements, direct mailings, word of mouth, contractors or direct contact with DEEP staff and interns. Deep had initially intended to offer efficiency information through workshops, but found it was hard to get attendance. The program met its education and outreach goals by tabling at events such as festivals and the local farmers market. For its low income window evaporative cooler program DEEP canvassed the mobile homes in the program area. DEEP programs were marketed through City of Davis communication channels such as agency newsletters and the city website, and Davis city staff also promoted programs to local media. The commercial lighting retrofit program used contractor sales staff to promote the program in concert with DEEP staff visits to local businesses. DEEP ran a website with program and energy efficiency information and the DEEP offices became the Davis Energy Center, a walk in center open to members of the public.

Resources: Funding for the Davis Energy Efficiency Project was provided by public goods charge funds through the California Public Utilities Commission (CPUC). Pacific Gas and Electric (PG&E) served as the contract administer, and the City of Davis was the primary contractor. The table below shows a summary of the program budget.

DEEP Budget[9]	
	Budget
Total Administrative Costs	$ 450,962.00
Total Marketing/Advertising/Outreach Costs	$ 243,216.07
Total Direct Implementation costs	$1,058,110.58
Total Evaluation, Measurement and Verification Costs	$ 153,679.35
Budget Grand Total	**$1,905,968.00**
*Program expenditures came in approximately 12 percent below budget	

The City of Davis initially expected to hire staff for the program but later decided to contract out program operations to the Valley Energy Efficiency Corporation (VEEC), which was formed for the purpose of implementing DEEP by two of the Energy Task Force members who helped write the proposal.[10]

[9] City of Davis, Davis Energy Efficiency Project. "Final Project Report, October 2002 through June 2004." (Draft)

[10] City of Davis, Davis Comprehensive Energy Efficiency Program. "Detailed Program Description." October 23, 2002. Also Bill Knox, Valley Energy Efficiency Corporation General Manager of DCEEP Implementation personal communication February 18, 2005.

Results

Evaluation: The California Public Utilities Program requires all PGC funded programs to undergo an external evaluation, measurement, and verification process. The DEEP evaluator was the Heschong Mahone Group, Inc. (HMG) of Fair Oaks, California. Evaluation methods included sample design, on-site data collection, decision-maker surveys, and analysis of energy savings.11 Energy savings from single family measures were determined by extrapolating from a statistical sample. Multifamily savings were measured in full. The decision-maker survey was used to determine a rate of free-ridership in the program as well as program satisfaction. The evaluation was concurrent with program activities.

Quantitative

Final DEEP Program Savings[12]			
	Final Program Savings Estimate[a]	Net Realization Rate[b]	Final Evaluated Net Savings Estimate[c]
Electricity Savings (kWh)	4,784,118	72%	3,467,811
Gas Savings (therms)	5,604	34%	1,929
Demand Reduction (kW)	1,115	83%	916

a. Estimated by Program Implementer
b. Net Realization Rate is a combination of actual measure usage and free ridership factors
c. Estimated by program evaluator

The program increased its gross energy savings goals from 3.9MWh to 4.8MWh during the program because some of the measures were performing better than expected.[13] There were 16 energy efficiency measures in DEEP; of those only four had a kWh or therm realization rate of less than 75 percent of the program goal. The measures that were underperforming were the Commercial CFLs, the Residential CFLs, the Single Family window-mount evaporative cooler, and the multi-family laundry retrofit.

[11] Heschong Mahone Group, Inc. "Evaluation, Measurement and Verification of the Davis Energy Efficiency Program." September 22, 2004. http://www.calmac.org/publications/DEEP_Final_Evaluation_Report.pdf

[12] Heschong Mahone Group, Inc. "Evaluation, Measurement and Verification of the Davis Energy Efficiency Program." September 22, 2004. http://www.calmac.org/publications/DEEP_Final_Evaluation_Report.pdf Table A-3: Final DEEP Actual Program Savings by EEM

[13] Heschong Mahone Group, Inc. "Evaluation, Measurement and Verification of the Davis Energy Efficiency Program." September 22, 2004. http://www.calmac.org/publications/DEEP_Final_Evaluation_Report.pdf

DEEP has a self reported Total Resource Cost Benefit Ratio of 1.58 ($1.79 million in costs to $2.83 million in benefits) and a Participant Cost Benefit Ratio of 4.0 ($920,000 in costs to $3.78 million in benefits). The program achieved higher net benefits than anticipated in the program plan.

Qualitative: DEEP offered energy education as well as efficiency measures, but in the end program staff felt that the evaluation methods required by the CPUC undervalued DEEP's qualitative outcomes, and very little discussion of these outcomes is included in the program evaluation document. DEEP received positive press coverage, including at least two articles in the local newspaper, The Davis Enterprise. The program also generated goodwill for the City of Davis, the primary contractor of the program. The program affected the market with its demonstration of window-mount evaporative coolers, which are now being used by other efficiency programs in the area.

Barriers: DEEP was participating in the first time that the CPUC had opened PGC funding up to local, non-utility efficiency programs. As with any new process, there were stumbling blocks. One of the problems many of the programs faced that year was a delay—11 months in the case of DEEP—in getting contracts signed with the utility program administrator to start the work. This delay was in part because the utility was challenging the allocation of PGC funds to third parties at the CPUC, and the utility notified program implementers that if the challenge was successful the implementers would have to return any PGC funding received, whether or not it had been spent on efficiency measures already—a risk that many nonprofits and cities were unable to take.14 This raises an issue that many community energy programs face: Small cities and nonprofits do not often have the legal or administrative support systems to take on issues like this that may arise during the implementation programs, therefore contracts need to be clear and simple and liability issues must be addressed upfront.

Another barrier DEEP dealt with was the limitation of a short funding cycle. The program had initially planned on doing a multifamily cool roofs program but found that the lead time on such a major project was too long, so while local businesses expressed interest in the program, the measure was eventually dropped from DEEP's portfolio. It seems that a one to two year funding cycle for local energy programs gives new parties more opportunities to participate, but constrains the type of efficiency measures that can be offered. In California, it has also created a stop and start cycle of program offerings because popular programs use up their available funding ahead of schedule and must wait for another funding cycle to begin. This creates an inconsistency in program availability that damages marketing and outreach efforts—if a program is

[14] City of Davis, Bob Weir, Public Works Director; Mike Goodison, Assistant to the Director; Ethan Walsh, Deputy City Attorney. "Grant Contract for the Davis Comprehensive Energy Efficiency Program." Staff Report to City Council. September 4, 2002.
http://www.city.davis.ca.us/meetings/councilpackets/20020911/03O.pdf

available over a longer period it allows customer experience to build and information can spread by word of mouth, but if a program is not consistently available it must re-market itself each time it is refunded.

According to the program implementers, the administrative requirements of the PGC system required a large amount of time. The volume of reporting required and the inflexibility of the contract, which was more regulatory than performance based, was a burden on the program. As a new program, which was trying some experimental efficiency measures, DEEP made a number of changes to its initial proposal as the program progressed and learned and had to go through two rounds of contract change orders. While the administrative requirements of a program such as this must designed to ensure accountability for program results, accountability must be balanced against administrative costs and program flexibility and innovation. In addition, the CPUC required the use of a MS Excel-based program reporting workbook that was difficult for program implementers and evaluators to use. Many software and web-based applications are now available to allow efficiency measure and contact databases, if well designed, to be created once and used by many different community efficiency programs, reducing administrative costs.

Success Factors

The two principle staff members of the program subcontractor brought a wealth of experience to the program--Marshall Hunt, is an engineer who worked in Pacific Gas and Electric's Energy Efficiency group until 2002; Bill Knox has experience in small business energy programs and was an employee of the California Energy Commission administering programs including San Francisco's Power Savers small commercial lighting upgrade program. Additionally:

- VEEC hired student interns for much of the program outreach work and used contractors for the installation of efficiency measures, as well as for marketing of programs such as the commercial lighting upgrades.
- Having the City of Davis as the contract lead for the program likely gave the program a high level of trustworthiness in the eyes of local residents and businesses.
- The most successful DEEP program was its commercial lighting retrofit program. There have been a number of similar programs in California run by local government and nonprofit implementers. The programs seem to work best when a capable lighting contractor is found that can handle the sales, lighting audits, and installations. The DEEP program was aided by a spreadsheet based job specification program that allowed various contractors to describe the job clearly and consistently and calculated estimated energy savings directly.
- The DEEP program clearly benefited from networking with other local lighting retrofit programs in the area, specifically the DEEP had an easier time avoiding bad contractors because it had information on the experience of other programs.[15]

[15] Also Bill Knox, Valley Energy Efficiency Corporation General Manager of DCEEP Implementation personal communication February 18, 2005.

Lessons Learned

- While local programs need the flexibility to adapt efficiency and outreach measures to local conditions, administrative tools such as databases can be used across programs to increase accuracy and usability while reducing administration costs.
- Communication between community energy program implementers promotes learning and advancement of programs and helps avoid duplication of tasks.
- Community based programs can be testing grounds for efficiency innovations, such as DEEP's window mounted evaporated cooler, which can be adopted more broadly once shown to create proven energy savings.
- Program evaluations of community based programs need to attempt to measure both qualitative and quantitative impacts of programs to capture the true program impact.