



Chapter 5: Local Action Plan Best Bets Climate Friendly Residences

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Residential Home Efficiency Upgrades

Residents can help cities achieve carbon-footprint reduction goals by increasing the energy efficiency of their homes. New and replacement electrical appliances are prime targets for efficiency upgrades. A number of community-owned public utilities and some investor owned utilities offer appliance rebates to help residents choose energy efficiency. The easy targets for rebates are lighting, refrigerators and water heaters. Other electrical and water-conservation targets include clothes washers and dishwashers. In some cases, special utilities create special opportunities for rebates and incentives.

CASE STUDY: Anita, IA

Anita Municipal Utilities (AMU) is the non-profit redistribution utility in Anita, IA (pop. about 1,200). Wholesale power is purchased from a combination of sources and provided to the town. Power is purchased at an "interruptible" rate meaning that AMU must stop taking power if loads go high enough to cause problems to their supplier. There is a built-in practical incentive for energy efficiency. The city offers rebates to install or retrofit efficient space-heating equipment (when replacing gas or propane) at \$10/kW saved (up

to \$250). There is a \$50 rebate for efficient electric water heaters. They also offer rebates up to \$450 on air-to-air, ground-loop and water source systems. Grants are available for geothermal heat pump systems of \$500.¹

AMU encourages customers to voluntarily contribute to a "Green Energy" program that enables the utility to burn B2 soy diesel (a mix of 2% soy diesel made in Iowa with 98% diesel). Customer contributions offset the \$0.02/gal difference in cost compared to

normal diesel. Each \$1.50 contributed to the program would convert about 1,000 kWh to "Green Energy" which is blended in to the electrical energy provided by AMU. Customers are encouraged to commit to \$1.50, \$3, or \$5 per month added to their bills for a 12-month minimum.

CONTACT

Anita Municipal Utilities
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amu@anitaiowa.com

CASE STUDY: Osage, IA

Osage Municipal Utilities (Osage, IA pop. 3,600) operates an efficiency incentive program that has saved residents about \$1.2 million per year in their utility bills (for a total cost to the utility of about \$250,000). The program uses a range of giveaway programs, rebates and energy audits to promote energy efficiency among its customers.

Services offered include, among other things, free compact fluorescent bulb giveaways and rebates, energy audits, electrical system scans to identify line-loss, free use of electrical tester

meters to locate inefficient appliances, complete energy audits and interest buy-downs for efficiency projects. When it began in 1974, the voluntary program was saving residents over \$1 million each year. The program cut energy prices to half that of the state average, and unemployment to half that of the national average, as the lower bills enticed more factories to come to town. The extensive efficiency measures taken in this small town have reduced its natural gas consumption by 45% and its annual growth in electricity demand by half, from

6% to 3%. The 950 compact fluorescent bulbs in use will prevent the burning of nearly 200 tons of coal, and every year the compact fluorescent bulbs will reduce annual pollution by nearly 1,000 tons of carbon dioxide (CO₂) and 13 tons of sulfur dioxide (SO₂).²

CONTACT

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P.O. Box 207
720 Chestnut Street
Osage, IA 50461
(515) 732-3731

¹ Anita Municipal Utilities, www.anitaiowa.com/utility.html#program, 3 October 2006.

² "Osage Municipal Utilities Demand-Side Management" Smart Communities Network website. www.smartcommunities.ncat.org/success/osage_muni.shtml, 5 October 2006.

Home Efficiency Upgrades

CASE STUDY: Wakefield, MA

The Wakefield Municipal Gas and Light Department (Wakefield, Massachusetts, pop. 25,000), in cooperation with the Massachusetts Municipal Wholesale Electric Company³ offers rebates on ENERGY

STAR® labeled appliances. Rebates are available on programmable thermostats (\$20), clothes washers (\$50), dishwashers (\$50) and water heaters (\$100).⁴

CONTACT

(888) 333-7525 or
(888) 335-7203
energyquestions@mmwec.org

Home Efficiency Upgrades

CASE STUDY: Palo Alto, CA

The mid-sized city of Palo Alto, California (pop. about 60,000) offers an extensive rebate program on many appliances including dishwashers, refrigerators, gas furnaces, central air conditioning, boilers, attic/roof and wall insulation, pool pumps and water heaters.

Rebate examples range from \$50 for a dishwasher, \$200 for pool pumps and up to \$300 for thorough insulation, \$250 for tank-less or very efficient standard tank water heaters. They have also partnered with the Santa Clara Valley Water District (SCVWD) to offer up to

\$150 rebates on clothes washers and currently developing an appliance recycling rebate.⁵⁶

CONTACT

Utility Marketing Services
(650) 329-2241
cpauresidential@cityofpaloalto.org

Home Efficiency Upgrades

CASE STUDY: Seattle, WA

Seattle City Light, Seattle, Washington's municipal electric utility offers numerous rebates to encourage efficiency. For example, residents can get a \$20 instant rebate on more efficient light fixtures (purchased from

certain stores) and up to \$100 on a clothes washer.⁷

The utility also offers a free Home Resource Profile, which is a detailed, customized report that shows you how your household

uses energy, water and solid waste.

CONTACT

Residential & Small Business
(206) 684-3800
rescons.scl@seattle.gov

³ Home Energy Loss Prevention Service, www.munihelps.org, 5 October 2006.

⁴ ENERGY STAR® catalog for participating customers, www.energyfederation.org/estarlights/default.php, 3 October 2006.

⁵ Palo Alto Appliance Rebates, www.cpau.com/programs/appliance/aplusindex.html, 3 October 2006.

⁶ Palo Alto Smart Energy Program, 2006-2008. www.cpau.com/programs/smtenergy/smartenergyform.pdf, also archived at www.natcapsolutions.org/ClimateManual/Cities/Chapter5/BestBets/Residential/PaloAlto_smartenergy.pdf, 3 October 2006.

⁷ Seattle Residential Conservation Programs and Services, www.ci.seattle.wa.us/light/conserves/resident/, 3 October 2006.

Local Policies to Promote Renewable Energy

There are a range of challenges for residents seeking to use renewable energy in their homes, including siting restrictions, lack of understanding of the technology, and long payback periods. Municipalities can shape regulation and provide incentives to assist residents in overcoming these hurdles.

Policies to Promote Renewable Energy

CASE STUDY: Sacramento, CA

The Sacramento Municipal Utility District (SMUD)⁸ offers rebates and loan financing for solar hot water system installation (city pop. about 400,000). Rebates of \$1,500 per solar water heating system are available for SMUD residential customers who replace their electric water heating system. In addition, SMUD offers 100% loan financing to cover the remaining costs, with a ten-year repayment period. SMUD provides all the funding for these incentives, and

free maintenance inspections after five years and again after 10 years.

SMUD also currently offers an incentive of \$2.80 per watt-AC up to \$14,000 to residential customers who contract directly with SMUD approved contractors for the purchase and installation of grid-connected solar electric (PV) systems. The incentive will be paid to the approved PV contractor and is intended be reflected in the contractor's bid to

the customer. Both traditional PV modules and building-integrated PV "roof shingles" are available under the program.⁹

CONTACT

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⁸ Sacramento Municipal Utility District, www.smud.org, 3 October 2006.

⁹ DSIRE, California Incentives for Renewables and Efficiency, www.dsireusa.org/library/includes/incentive2.cfm?Incentive_Code=CA13F&state=CA&CurrentPageID=1&RE=1&EE=1, 3 October 2006.

Policies to Promote Renewable Energy

CASE STUDY: Mahonoy Township, PA

Working with Community Environmental Legal Defense Fund (CELDF) the community of Mahoney Township, Pennsylvania, has been the first city in the state to introduce an ordinance to prohibit unsustainable energy production within the township, mandate a transition to sustainable energy

systems within the township, provide for the "enforcement of the ordinance and the rights of residents and nature" and provide for financial assistance for the conversion to sustainable energy systems.¹⁰ The township plans to finance the plan with a general revenue bond. As of October 2006, the Bill is

awaiting passage.

CONTACT

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675 Mower Road
Chambersburg, PA 17201
(717) 709-0457
info@celdf.org

Policies to Promote Renewable Energy

CASE STUDY: Boulder, CO

The city of Boulder, CO (pop. about 90,000) enacted an ordinance in 1991 to protect the use of solar energy.¹¹ The ordinance guarantees access to sunlight for homeowners and

renters in the city. This is done by setting limits on the amount of permitted shading by new construction and requiring that new buildings be sited to provide good solar access.¹²

CONTACT

City of Boulder
Building Services Center
1739 Broadway
(303) 441-1880

Policies to Promote Renewable Energy

CASE STUDY: Palo Alto, CA

The city of Palo Alto Utilities offers cash rebates to residents and businesses on the installation of new photovoltaic (PV) systems. Residents are eligible for a rebate of \$3 per watt-AC up to a \$9,000 maximum for a 3 kilowatt system. Commercial customers are eligible for a rebate of \$2 per Watt-AC up to \$50,000 maximum for a 25 kilowatt system. Nonprofit and institutional customers who are not eligible

for federal tax credits are eligible for a \$3 per watt rebate up to a \$30,000 maximum for a 10 kilowatt system.¹³

The Southern California Gas Company offers a similar rebate program for solar, but also extends rebates to other renewable and non-renewable alternative energies. The PV rebate is \$2.80/ W (30kW minimum). They also offer rebates on wind turbines

(\$1.50/W), renewable and non-renewable fuel cells (\$2.50-\$4.50/W), and waste gas generators and turbines (\$0.60-\$0.80/W).

CONTACT

City of Palo Alto
Utilities Customer Service Center
(650) 329-2161
UtilitiesCustomerService@cityofpaloalto.org

¹⁰ Mahoney Ordinance: www.celdf.org/Ordinances/SustainableEnergyOrdinance/tabid/256/Default.aspx, 29 September 2006.

¹¹ Solar Access Compliance, www.bouldercolorado.gov/files/PDS/codes/solrshad.pdf, also archived: www.natcapsolutions.org/ClimateManual/Cities/Chapter5/BestBets/Residential/Boulder_SolarAccess.pdf, 5 October 2006.

¹² Boulder Planning and Development Services, www.ci.boulder.co.us/buildingservices, 3 October 2006.

¹³ Palo Alto PV Partners Program, www.cpau.com/programs/pv-partners/pvindex.html, 3 October 2006.

Policies to Promote Renewable Energy

CASE STUDY: EI Centro, CA

Through the PV Solutions Rebate Program, Imperial Irrigation District¹⁴ (EI Centro, CA) provides rebates to residential and commercial customers who install grid-tied

PV systems. The rebate is \$2.80 per Watt-AC, up to a maximum of \$28,000 for residential systems and a maximum of \$84,000 for commercial systems.¹⁵

CONTACT

IID Public Programs Office—
Imperial Valley Imperial Irrigation
District
(760) 339-9032
info@iid.com

Policies to Promote Renewable Energy

CASE STUDY: Aspen, CO

The Community Office for Resource Efficiency (CORE) in Aspen and the Roaring Fork Valley area of Colorado offers a similar set of incentives—grid-tied PV power buyback, and zero-interest loan financing.¹⁶

Residents who purchase a solar PV system receive a cash rebate from CORE based on the

number of watts they install. CORE will give \$2.00 per watt installed by a certified installer and tied into the electric grid. This rebate is up to \$6,000. Residents may also finance that PV system with a Zero-Interest Loan. (The Loan OR the Rebate program are available but not both for the same project).¹⁷ Purchases of a solar hot water

system are eligible for cash rebates also— \$1,000, \$1,500, and \$2,000 for a 2-3 panel, 4-5 panel, or 6 or more panel system, respectively.

CONTACT

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Policies to Promote Renewable Energy

CASE STUDY: State of Minnesota

Along with a 30% federal tax credit and a state sales tax exemption for solar energy systems, Minnesota excludes from (real estate) property taxation the value added by solar-electric PV systems. However, the land on which a PV or wind system is located is taxable. In addition, all real and

personal property of wind-energy systems is exempt from the state's property tax¹⁸. The state also has a retail tax exemption when purchasing PV systems. An analysis has not been conducted to determine the money saved or number of PV systems installed.

CONTACT

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lise.trudeau@state.mn.us
energy.info@state.mn.us

¹⁴ IID Energy – Energy Saving-Tips, www.iid.com/, 3 October 2006.

¹⁵ IID Energy - PV Solutions Rebate Program, www.dsireusa.org/library/includes/incentive2.cfm?Incentive_Code=CA50F&state=CA&CurrentPageID=1&RE=1&EE=1, 3 October 2006.

¹⁶ Aspen Community Office for Resource Efficiency, www.aspencore.org/sitepages/pid46.php, 3 October 2006.

¹⁷ The Community Banks of Colorado is the partner for this program. Call their Aspen branch at (970) 544-8282 for more information.

¹⁸ Minnesota Department of Commerce, www.commerce.state.mn.us, 3 October 2006.

Lower-income Weatherization Assistance

Programs to help homeowners weatherize their homes can help a city reduce its carbon footprint. This is particularly true of low to middle income homeowners, who are otherwise unlikely to participate. Numerous public utilities, and non-profit organizations, offer services that come into the home to help residents assess energy inefficiencies and remedy them. Also, in many cases there is state and federal funding administered by municipalities to cover the costs of adding insulation and increasing efficiency when repairing or remodeling a home.¹⁹

A 2002 report on weatherization programs, *Meeting the Challenge: The Prospect of Achieving 30% Energy Savings Through The Weatherization Assistance Program*, by the DOE, surveyed four cities, one from the Northeast (Schenectady, NY), Midwest (Moline, IL), South (Birmingham, AL), and West (Eureka, CA).²⁰ The report states that “high-energy use” homes in colder climates can achieve savings over 30%, and in warmer climates savings of about 25%. Annual savings of approximately \$370 to \$410 are

estimated for high-energy-use houses in the warmer climate regions.²¹ The report’s extensive data and assessments are a valuable resource for communities seeking to design successful programs. The level of energy savings achieved obviously depends on the extent of the weatherization undertaken, both in terms of cost, and which measures will be effective in each climate. Thus regional considerations are important when deciding on which steps to take.

For example, the report shows that a \$2,400 weatherization package can enable a “typical” home in the Midwest to achieve energy savings of about 20% and CO₂ reductions of about 20%. A “high-energy use” house can achieve greater savings (about 22%) and CO₂ reductions (22%). An “expanded” package achieves even greater gains.

Weatherization measures resulting in relatively high savings for most of the houses studied are air sealing, installing attic and wall insulation, replacing an old refrigerator with a high-efficiency unit, resetting the temperature on an existing water heater, and installing a programmable thermostat on the central heating system.

Refrigerator replacement is particularly effective at reducing

electricity consumption, and delivering fuel bill savings, and CO₂ reductions).

Data reported by DOE in 1997²² shows positive results for surveys from 1989 and 1996 and increased benefits over the years. The “installation benefit/cost ratio,” reported at 2.39 (up from 1.58 in 1989), verifies the effectiveness of the programs. These increased benefits will be amplified given current energy costs. In fact, by 1996 a savings of 33% was demonstrated for gas space heat consumption. At that time, the household savings were almost \$200/year, and compared with the data reported in 2002 above, savings are still on the rise.

Another report, from the American Council for an Energy Efficient Economy written in 1997,²³ discusses city, state and utility policy instruments for achieving energy efficiency in existing homes and rentals, and outlines case studies on Residential Energy Conservation Ordinances (RECO's) and Home Energy Ratings Systems (HERS).

¹⁹ Habitat for Humanity has a how to guide to make homes more energy efficient, www.habitat.org/env/energy_bulletins.aspx, 3 October 2006.

²⁰ “Meeting the Challenge: The Prospect of Achieving 30 Percent Energy Savings through the Weatherization Assistance Program”, M. Schweitzer & J.F. Eisenberg, Oak Ridge National Laboratory, weatherization.ornl.gov/pdf/Con-479%20May22-FINAL.pdf. Summary of key findings, table, p. 13, also archived at,

www.natcapsolutions.org/ClimateManual/Cities/Chapter5/BestBets/Residential/Weatherization_2002.pdf, 3 October 2006.

²¹ *Ibid.* p. 14.

²² Progress Report of the National Weatherization Assistance Program, 1997, ORNL, www.eere.energy.gov/weatherization/pdfs/con450.pdf, also archived at,

www.natcapsolutions.org/ClimateManual/Cities/Chapter5/BestBets/Residential/ORNL_weatherization.pdf, 3 October 2006.

²³ American Council for an Energy Efficient Economy, Report Overview of “Policy Options for Improving Existing Housing Efficiency, 1997. www.aceee.org/pubs/a971.htm, 3 October 2006.

Weatherization Assistance

CASE STUDY: Moose Jaw, Canada

In late 2005, volunteers in Moose Jaw, Saskatchewan, organized Share the Warmth Home Energy Efficiency Program to help low-income families get ready for winter. Community volunteers and students from the Saskatchewan Institute of Applied Science and Technology helped 100 low-income families. Students applied techniques and concepts learned in the classroom. The free improvements—valued at more

than \$200 plus installation for each home—include preparing windows and doors for winter, replacing furnace filters, installing a working smoke detector, putting in low-flow shower heads and faucets, installing compact florescent lights and installing an ENERGY STAR® programmable thermostat.²⁴ The program is set to happen again in 2006, with 500 homes to be chosen. Anyone can apply, but

preference is to be given to homes with annual incomes of \$45,000CN or less. The average savings for each home is reported at about \$150 a year on energy and water bills.²⁵

CONTACT

Manager, Communications
Dave Burdeniuk
SaskEnergy
(306) 777-9842

Weatherization Assistance

CASE STUDY: Seattle, WA

The city of Seattle offers a free weatherization assessment and remedy program to qualifying homeowners as part of their HomeWise loan program. The program can weatherize low-income single family homes and in some cases apartment buildings. A "property rehabilitation specialist" comes to the home and recommends a conservation package that fits

the needs of that home. Services provided include: attic and crawlspace insulation, pipe wrapping, weatherstripping doors, caulking windows and using high-efficiency lighting in common areas.²⁶ The cities of Berkeley, California, and Boulder, Colorado, have similar programs.²⁷ In Boulder, volunteers go door to door to

offer residents a free efficient light bulb, and information on how to get their houses audited.

Seattle Contact
(206) 684-0721
Seattle.Housing@seattle.gov

Berkeley Contact
(510) 981-5434
Energy@ci.berkeley.ca.us

²⁴ Saskatchewan Energy Share, www.skenergyshare.com/share_the_warmth.htm, 3 October 2006.

²⁵ SaskEnergy Share the Warmth Media Release, www.siasst.sk.ca/departments/mktgcomms/pdf05/sharethewarmthday.pdf, also archived at, www.natcapsolutions.org/ClimateManual/Cities/Chapter5/BestBets/Residential/MooseJaw_sharethewarmth.pdf, 3 October 2006.

²⁶ Seattle Office of Housing, www.seattle.gov/housing/06-HomeWise/HomeRepair&.htm, 5 October 2006.

²⁷ Berkeley Office of Energy and Sustainable Development, www.ci.berkeley.ca.us/sustainable/, 5 October 2006.

Weatherization Assistance

CASE STUDY: Dearborn, MI

In Dearborn, Michigan low-income home owners and renters are eligible to apply for Weatherization Program (WX) assistance through the Wayne-Metropolitan Community Action Agency (WMCAA). Examples of eligible work include sidewall insulation, weather-stripping doors and windows, broken glass

repair, furnace inspection and tune-up, caulking doors and windows, attic insulation and ventilation, crawl space insulation and box sill insulation.²⁸ A pre-inspection and blower door test will determine the specific measures to be installed by private contractors.

CONTACT

Wayne Metropolitan Community Action Agency
(734) 246-2280

City Of Dearborn Economic and Community Development Department
(313) 943-2180

Weatherization Assistance

CASE STUDY: Portland, OR

The city of Portland offers a loan program through the Portland Development Commission (PDC) for home improvements including energy efficiency upgrades. The loans are up to \$20,000 with low-interest and deferred-payment and are available for income-qualified homeowners. The Community Action Program (CAP) is a county-level program for lower-income weatherization assistance. Each county administers a CAP to offer free weatherization services to low-income households. Both single-family homes and multi-unit complexes may be eligible. Priority is given to households with young children, senior citizens and people with disabilities.²⁹

The Portland Office of Sustainable Development also provides free assistance to property owners (of multifamily units) to achieve energy efficiency and financial savings through weatherization. Their customer service specialists educate the multifamily community about energy efficiency and help property owners and managers apply for valuable incentives from the Energy Trust of Oregon, Inc. and the Oregon Department of Energy. Through innovative public-private collaboration, the Office of Sustainable Development Multifamily Energy Assistance Program promotes and administers the Multifamily Home Energy Savings program

for Energy Trust of Oregon. The Multifamily Home Energy Savings program provides property owners with cash incentives for purchasing and installing energy efficient weatherization measures, such as new energy efficient windows; ceiling, floor and wall insulation, low-flow showerheads and more. They also assist property owners in applying for Business Energy Tax Credits from the Oregon Department of Energy.³⁰

CONTACT

Neil Fitzgerald
PDC 222 NW Fifth Ave.
Portland, OR 97209-3859
(503) 823-3200

²⁸ Dearborn Home Weatherization Program, www.cityofdearborn.org/departments/economicdev/wx.shtml, 5 October 2006. Program funding provided through the State of Michigan Department of Human Services.

²⁹ Contact each county for information:
Multnomah 503-248-3999, ext. 22816
Washington 503-648-6646
Clackamas 503-534-5500

³⁰ www.portlandonline.com/osd/index.cfm?c=41816&a=111233, 3 October 2006.

³⁰ Portland Multi-Family Home Energy Savings, www.portlandonline.com/osd/index.cfm?&a=111266&c=41818, 3 October 2006.

Split Incentives in Renter Occupied Homes

Energy efficiency in rental homes is neglected by many parties on both sides of the owner/renter relationship since neither party has an economic incentives to make energy-efficient improvements. In most cases, rental home owners are not the ones who pay for utilities, this falls to the renters. However, the renters generally get no payback

for capital improvements to the home they are renting for relatively short periods. Owners of rental property get federal tax write-offs for *repairs* made to a rental property, but not for *improvements* (the opposite is true of an owner-occupied home). Businesses and commercial real estate may benefit from local tax incentives, but local (city) taxes usually do not affect the rental homeowner significantly, making city tax incentives less attractive to that group. Thus both groups are lacking in incentives to make improvements to the home that increase energy efficiency.

Several interesting projects are attempting to address this problem. They range from business tax incentives, to performance contracting, time-of-sale efficiency standards ordinances, rebate programs and rental efficiency ratings. Also, in many larger cities a public housing authority may be the largest landlord in town. This offers an opportunity for the central municipal government to make changes to a large number of rental properties directly.

Split Incentives in Renter-Occupied Homes

CASE STUDY: State of Maine

A Maine program³¹ requires landlords to fill out an “Energy Efficiency Disclosure Form”³² that lists components, such as insulation or heating fuel types, in rental properties relevant to the amount of energy that the property is likely to use.

Landlords must submit such a form for each of their rental properties. They are not required to meet any standards. However, the energy efficiency standards provide guidance to improve the efficiency of rental properties.

CONTACT

Efficiency Maine
(866) 376-2463
efficiencymaine@maine.gov

³¹ Efficiency Maine, www.efficiencymaine.com, 5 October 2006.

³² Maine Energy Efficiency Disclosure Form www.maine.gov/mpuc/doing_business/forms/FactSheet_000.doc, also archived at, www.natcapsolutions.org/ClimateManual/Cities/Chapter5/BestBets/Residential/Maine_ERentals.doc, 3 October 2006.

CASE STUDY: State of Vermont³³

Performance contracting is one approach to the problem of split incentives in rental homes. Financial risk for the energy efficiency improvements is assumed by an energy services company, whose payback comes from the recipient of the improvements, out of his or her energy savings. The Vermont Energy Investment Corporation (VEIC)³⁴ provides financing, technical expertise, reliable information and direct installation of energy efficiency measures. They have a partnership with Vermont Housing Finance Agency.

VEIC operates an energy services company (ESCO) that has long-term relationships with building owners to implement energy efficiency measures. This works as an *energy services company*, through *performance contracting*. VEIC assumes the financial risk for projects and is paid out of the energy cost savings. Basically, the ESCO sells efficiency and clients pay for the ESCO's improvements out of the lowered energy bills. The client's payments to ESCO are based on a percentage of the measured energy cost savings.

This program uses creative financing through the Vermont Housing Finance Agency. In the 80s and 90s, this agency launched programs to help owners of subsidized multi-family housing boost the energy efficiency of their buildings. This worked by setting aside "project cost escrow funds" at the time of the original financing that were held for 7-10 years to be used for necessary repairs and improvements. The catch is that at the time of spending the money, an energy audit is required; and if energy efficiency improvements are identified, the owners are encouraged to make those repairs using the money out of the energy savings.

The split-incentive created in a rental unit is further addressed in Burlington through a time-of-sale ordinance requiring minimum energy efficiency standard be met at each sale of the property (RECOs, or residential energy conservation ordinances). At the time of sale an energy audit must be performed and the buyer or seller may bring the property into compliance. If it is the buyer, he or she has one year to bring the property into compliance. The

Burlington Electric Utility administers the ordinance and also consults on financing, technical assistance and how to go beyond the minimum requirements. This is being phased in over time (only covering a portion of the city of Burlington in 2006) and will be phased in to all of Burlington in 2 years following a report to the city council.

Most tenants in the region move after one year in each residence, with over half citing high energy costs as a reason for the move. With increased efficiency (mandated by the ordinance) tenants may stay longer. Improvement costs may be passed on through higher rents, but these should be offset by lower utility bills (which in a way takes advantage of the split-incentive). This leads nicely to the next incentive, making energy efficiency transparent to the renter.

CONTACT

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255 South Champlain Street
Burlington, VT 05401-4717
(802) 658-6060
beth@veic.org

³³ EPA Climate Change Solutions, [yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BWJ4R/\\$File/vermonttrimsenergybills.pdf](http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BWJ4R/$File/vermonttrimsenergybills.pdf), also archived at, www.natcapsolutions.org/ClimateManual/Cities/Chapter5/BestBets/Residential/Vermont_climate.pdf, 3 October 2006.

³⁴ Vermont Energy Investment Corporation, www.veic.org/, 12 October 2006.

Split Incentives in Renter-Occupied Homes

CASE STUDY: Allegheny, PA

The idea behind the Allegheny College project³⁵ is to make energy efficiency visible to the renter/consumer. Beginning in 1998, The Commonwealth Community Energy Project, formerly The Meadville Community Energy Project,³⁶ developed a local Home Energy Ratings System. One of the first goals of the program was to evaluate the energy usage of Meadville's many rental properties. Data on houses'

insulation levels, air leakage, heating system efficiency and other property features was collected and then used to determine a rating. Energy audits leading to an efficiency rating allow the prospective renter to shop for a rental with the best total cost—rent *and* utilities. The landlords were given suggestions on how they increase efficiency in their properties and their costs, as well as a low-interest loan program

for making the improvements. An education system was designed for renters to explain what the ratings mean and simple things they can do to save energy. The program estimated that changes in the 50 properties rated over the past four years have resulted in a savings of \$30,000 annually.³⁷

CONTACT

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Split Incentives in Renter-Occupied Homes

CASE STUDY: Lake Champlain, VT

If renters in the Lake Champlain Valley region of Vermont qualify (low-income), the Champlain Valley Weatherization Service (CVWS) will pay for weatherization to the rental home. It ends up at little or no

cost to the owner. It is part of the Champlain Valley Office of Economic Opportunity, which is "funded through a variety of grants, service contracts and donations."³⁸

CONTACT

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Champlain Valley Weatherization Service
802-524-6804

³⁵ Meadville Community Energy Project (MCEP), based at Allegheny College homeenergy.org/archive/hem.dis.anl.gov/eehem/00/000706.html, 5 October 2006.

³⁶ Commonwealth Community Energy Project, energy.allegheny.edu/, 30 October 2006.

³⁷ Allegheny newsletter, onthehill.allegheny.edu/autumn02/mcep.html, 5 October 2006.

³⁸ Champlain Valley Weatherization Service www.cvoeo.org/wx/rentalpropownwx.htm, 3 October 2006.

Split Incentives in Renter-Occupied Homes

CASE STUDY: State of New York

The Assisted Multifamily Program (AMP) provides a range of incentives to owners of publicly assisted, multifamily buildings in New York State to pay for energy efficiency improvements. Services include

energy assessments, financing to complete the improvements, coordination with housing authorities, contractor oversight, and 3 years of energy monitoring afterward.³⁹

CONTACT⁴⁰

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Split Incentives in Renter-Occupied Homes

CASE STUDY: San Diego, CA

San Diego Gas and Electric Multi-family rebate is a program designed to mitigate the split incentive by going directly to the owner/manager. Incentives are

offered to the owner/manager directly to upgrade equipment; it offsets the incremental cost of purchasing this equipment.⁴¹

CONTACT

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Statewide Multi-family Rebates
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Home Size Restrictions, Taxing Large Residential Energy Consumers

Some communities face issues with residents building large square-footage homes. In resorts especially, these trophy homes see little use, and yet remain

heated and cooled year-round. Add such amenities as heated driveways (which can double a home's energy use), outdoor pools and hot tubs, and the community's carbon footprint can soar. Even good enforcement of energy efficiency codes may lose out to the sheer size of the energy needs of such large spaces, and luxurious amenities. Large houses, defined

as being in excess of 5,000square feet, create environmental and social impacts. They require more resources to build and more energy to operate. They impact view sheds and wildlife habitats. Large, widely dispersed houses increase costs to existing taxpayers in services as well. Ordinance tactics in use include energy mitigation programs and size caps on home construction.⁴²

³⁹ New York Energy Smart www.getenergysmart.org/WhereYouLive/AssistedHomePerformance/overview.asp, 3 October 2006.

⁴⁰ The AMP is a grant program implemented by Hamilton, Rabinovitz & Alschuler, Inc. on behalf of NYSERDA. This is the contact person listed for the AMP program and can be found at this website: www.dsireusa.org/library/includes/GenericIncentive.cfm?Incentive_Code=NY23F¤tpageid=3&EE=0&RE=0, 3 October 2006.

⁴¹ San Diego Multifamily Rebate and Service, www.sdge.com/residential/multi_family.shtml, 3 October 2006.

⁴² Discussion of these claims, relative to Gunnison County, CO, www.hccaonline.org/page.cfm?pageid=2053, 3 October 2006.

Home Size Restrictions and Energy Taxes

CASE STUDY: Aspen, CO (Pitkin County)⁴³

In 2000, Aspen and Pitkin County established the Renewable Energy Mitigation Program (REMP)⁴⁴ as a way of promoting renewable energy and energy efficiency. Pitkin County and the city of Aspen building codes require new homes to meet a strict energy "budget."

The code regulates the amount of grid-tied energy used for big energy consumption in the community: melting snow, spas, swimming pools and houses over 5,000 and 10,000 square feet. The energy for these uses must fit within a prescribed energy budget, or 50% of this energy can be supplied by on-site renewable energy systems. Under the Energy Code, the REMP allows for the payment of a mitigation fee instead of

installing on-site renewable energy systems. In addition, houses over 5,000 square feet are required to install a renewable energy system on site or pay a fee of \$5,000. The fee for houses over 10,000 square feet is \$10,000.

The Community Office for Resource Efficiency (CORE) manages the REMP funds with oversight from others.⁴⁵

REMP Fees support an incentive program that leverages private investments in renewable energy and energy efficiency. Portions of the fees also provide funds for renewable energy and energy efficiency technologies in public buildings and affordable housing. All projects are subject to

approval by the city of Aspen and Pitkin County. In its first 2 years, the fund accumulated approximately \$1.5 million, ten times the expectation, and by March 2006 had collected about \$5.1 million.

In 2006 Pitkin County passed a further code restricting the size of homes built there. A 15,000 sq. ft cap on homes is now in effect, with a limit on urban homes to 5,750 sq. ft. Several loopholes in the previous code were also removed.⁴⁶

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Home Size Restrictions and Energy Taxes

CASE STUDY: Marin County, CA

Marin County, California passed a similar ordinance in October 2002. The goals of Ordinance 3356⁴⁷ are to reduce the annual and peak energy consumption of large homes, and to ensure that a new single family home larger than 3,500 square feet does not

exceed the energy use of the Title 24 standard of the equivalent home designed at 3,500 sq. ft. This can be achieved with readily available energy efficiency measures and/or by supplementing energy use with renewable energy.⁴⁸

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⁴³ Aspen Canary Initiative, www.aspenglobalwarming.com/, 3 October 2006.

⁴⁴ Aspen and Pitkin County REM Program, www.newrules.org/environment/climateaspen.html, 30 October 2006.

⁴⁵ CORE, REM Projects, www.aspencore.org/sitepages/pid56.php, 30 October 2006.

⁴⁶ Interview with Pitkin County community development director Cindy Houben: www.kcfr.org/cgi-bin/comatters/comatters_play.aspx?play=2473&type=comatters.aspx.

⁴⁷ Marin County Energy Efficiency Ordinance, www.caleep.com/docs/resources/greenbuildings/Marin%20County%20Res%20EE%20Ordinance.pdf#search=%22marin%20county%20home%20size%20square%20feet%22, also archived at, www.natcapsolutions.org/ClimateManual/Cities/Chapter5/BestBets/Residential/Marin_Ordinance3356.pdf, 5 October 2006.

⁴⁸ Marin County Community Development Agency, www.co.marin.ca.us/depts/CD/main/comdev/advance/best/dwelling.cfm, 5 October 2006.

Energy and Water Efficiency by Smart-Metering, Price Signals and Price Structuring

Energy use fluctuates throughout the day by hour, and by day of the week. Wholesale energy prices usually vary according to peak demand cycles. Allowing consumers to easily see how much energy they are using, and what the real-time prices are enables residents to vary their energy use according to demand cycles and fluctuations in price. Doing this lowers energy use, cuts consumer bills and dampens price fluctuations.

So-called "smart-meters" provide a feedback loop between customers and suppliers to regulate usage according to price signals. The aim of smart-metering is to change consumers' behavior as they become aware of how they use energy and what this is costing them.⁴⁹ Currently, consumers purchase energy for their homes unaware of the unit costs at the time of use. Most consumers can only find out the cost (on their bill), long after they could have changed their consumption patterns. Smart metering would alert consumers to peak and off-peak prices at the time they are happening, allowing them to help the utility

reduce peak demand. In some cases, appliances are also programmed by the consumer to shut off according to utility system load and price signals. Many states are leading the way by recommending the development and dispersal of smart meters and removing any barriers that have previously existed.⁵⁰

Innovative Electrical Metering

In early 2006, Pacific Northwest National Laboratory began testing the Pacific Northwest GridWise™ Demonstration project, a regional initiative to test and speed adoption of new smart grid technologies to make the power grid more resilient and efficient. About 300 volunteers in Washington's Olympic Peninsula, in Yakima and Gresham, Oregon are testing the system for a year. Approximately 200 homes will receive real-time price information through a broadband Internet connection. Automated equipment will adjust energy use based on price. In addition, some customers will have computer chips embedded in their dryers and water heaters that can sense when the power transmission system is under stress and automatically turn off certain functions briefly until the grid can be stabilized by power operators. The year-long study is

part of the Pacific Northwest GridWise Demonstration, a project funded primarily by DOE. Northwest utilities, appliance manufacturers and technology companies are supporting this effort to demonstrate the devices and assess the resulting consumer response. In the pricing study, automated controls will adjust appliances and thermostats based on predetermined instructions from homeowners. The volunteers can choose to curtail or reduce energy use when prices are higher. At any point, homeowners have the ability to override even their preprogrammed preferences to achieve maximum comfort and convenience. If homeowners choose to reduce electric consumption at times of higher prices, the banked money they save becomes real as they are issued a check from the GridWise program each quarter. Price conscious participants are expected to earn about \$150 during the year. Nobody will lose money during the experiment, but higher prices for peak usage could become a feature in the future.

A PNNL study shows that creating a smarter grid through information technology could save \$80 billion over 20 years nationally by offsetting costs of building new electric infrastructure – the generators,

⁴⁹ Informational articles: seattletimes.nwsources.com/html/business/technology/2002734592_smartgrid12.html, 5 October 2006
news.bbc.co.uk/2/hi/science/nature/4754109.stm, 5 October 2006.
www.americanenergyindependence.com/smartmeters.html, 5 October 2006.

⁵⁰ On August 1st, 2006 the New York Public Service Commission issued an order to support utility investment in advanced metering technology, [www3.dps.state.ny.us/pscweb/WebFileRoom.nsf/ArticlesByCategory/BDD11878B2AC5A98852571B20061CF54/\\$File/94e0952_ord_08_01_06.pdf](http://www3.dps.state.ny.us/pscweb/WebFileRoom.nsf/ArticlesByCategory/BDD11878B2AC5A98852571B20061CF54/$File/94e0952_ord_08_01_06.pdf), also archived at, www.natcapsolutions.org/ClimateManual/Cities/Chapter5/BestBets/Infrastructure/NYOrder_metering_2006.pdf, 5 December 2006.

transmission lines and substations that will be required to meet estimated load growth.⁵¹ It would also save significant carbon emissions.⁵²

⁵¹ Pacific Northwest National Laboratory, www.pnl.gov/news/2006/06-01.stm, 3 October 2006.
⁵² For more information contact: 1-888-375-PNNL or inquiry@pnl.gov, 3 October 2006.

Additional Resources

EnergySavers.gov information clearinghouse:

www.energysavers.gov/stateagencies.html

Alliance to Save Energy:

www.ase.org/section/program

Renewable energy programs for public utilities:

www.dnr.mo.gov/energy/utilities/Summary%20031203BW.doc, p. 13

Sample resolution for energy efficiency:

www.cabq.gov/energy/document/Resolution329.doc

Article on cities and counties leading the energy-efficiency charge

www.americancityandcounty.com/mag/government_energy_efficiency_taking/index.html

Residential high-rise in NYC

www.thesolaire.com/

Habitat for Humanity partners with the Department of Energy to build energy efficient homes and improve existing homes.

www.nrel.gov/docs/fy05osti/38116.pdf

Habitat for Humanity also has a program called “**Better Built Program**”, which provides contacts, materials and resources for local Habitat affiliates who seek help in building more sustainable houses

www.habitat.org/env/better_built.aspx

Energy Efficient Home Article Resource Directory

Database of articles on energy efficient homes. Provides practical and clear information for the homeowner.

www.energyefficienthomearticles.com/

“Creating a High Performance Workspace” G/Rated Tenant Improvement Plan, 2004. This

guide has been created by the City of Portland and the City of Beaverton Solid Waste & Recycling Program to support and promote healthy, productive, durable, resource- and energy efficient workspaces. This is a good resource for commercial building owners, because it details the action strategies for the project manager, design and construction team to build an efficient and healthy workspace.

www.portlandonline.com/shared/cfm/image.cfm?id=112733

ENERGY STAR® Change a Light Change a World Campaign

The ENERGY STAR® Change a Light, Change the World Campaign is a national call-to-action to encourage individuals to help change the world, one light—one energy-saving step—at a time. Individuals who already pledged in 2005 will help save more than \$2 million in energy costs and prevent more than 33 million pounds of greenhouse gas emissions. The Environmental Protection Agency, Department of Energy, and Department of Housing and Urban Development are pleased to partner to sponsor the Campaign this year

www.energystar.gov/index.cfm?c=change_light.changealight_about

Smart Energy Living is an informational resource provided by Colorado Energy Science Center. Smart Energy Living brings together the information, resources and tools to help you understand how to reduce your energy use and save money. We publish a semi-annual magazine, offer workshops, provide online information, and links to contractors.

smartenergyliving.org/cm/Home.html

A Primer on Smart Metering,

New York State Energy Research and Development Authority

www.nyserda.org/programs/pdfs/meteringprimer.pdf

The Home Resource Profile is a detailed, customized report that shows you how your household uses energy, water and solid waste. It is available to any Seattle City Light or Seattle Public Utilities residential customer. Whether you live in a house, condominium or apartment, this free service will give you useful information about your utility bills and how to save money

www.cityofseattle.net/conservationprofile/

City of Seattle Energy Savings Tips Directory. These energy savings tips are from *30 Simple Energy Things You Can Do to Save the Earth* authored by Seattle City Light and The EarthWorks Group.

www.cityofseattle.net/light/conservation/tips/



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