



SUSTAINABLE CITIES

Best Practices for Renewable Energy & Energy Efficiency

Austin • Chicago • Fort Collins • Portland



Chicago's City Hall Has a Green Roof

Photos courtesy of Roofscapes, Inc.

<http://www.roofmeadow.com/>

FIVE STAR CONSULTANTS

Ken Regelson

10/28/2005

Introduction

Why?

Why try?

Why should a city even try to be sustainable?

Why do Austin, Chicago, Fort Collins, and Portland care about being green or sustainable?

These cities told us investing in renewable energy and energy efficiency programs helped them:

- Save Money - literally millions of dollars each year.
- Provide economic benefits to their residents.
- Reduce future energy cost risks.
- Comply with and improve upon Federal clean air standards.
- Provide a more livable environment.

And just as importantly, their residents approve of these programs (e.g., some Austin programs receive 94% approval ratings).

What?

This report documents innovative and successful programs U.S. cities are using to become more sustainable. Through web research and telephone interviews, the author researched numerous municipal programs for renewable energy (RE) and energy efficiency (EE).

Four cities were chosen for an in-depth look into the history, status, and results of their RE & EE programs. Initially, we conducted cursory research on Minneapolis, Salt Lake City, Denver, Burlington, and others. Ultimately, we chose Austin, Texas, Chicago, Illinois, Fort Collins, Colorado, and Portland, Oregon, for further study as they offered the best breadth and depth of sustainability programs and goals with a mix of city size and utility ownership models.

We wish time allowed an in-depth look at all the other cities we researched. Most cities appear to have programs in RE & EE that others can learn from.



Attractive, affordable, and green moderate income home in Portland.

This report was funded by the Sierra Club and sponsored by the Clean Energy Campaign of the Rocky Mountain Chapter of the Sierra Club.

Sustainable Cities

Austin • Chicago • Fort Collins • Portland

Executive Summary

Four cities were selected for a review of their practices and programs using renewable energy (RE) and energy efficiency (EE) to become more sustainable. Through the course of the interview and research process, a number of common key elements came to light. Not every element is used in each city, but most of these elements were common to these cities. This report finds that the key elements for implementing sustainability in cities are:

Leadership - most often the original impetus came from a mayor or councilperson. In Chicago, for example, Mayor Daley's often-expressed goal is to "make Chicago the greenest city in America."

A Plan - All had a master plan or roadmap to follow.

Funding - This element saw the most variation among the cities. Funding for EE and RE investments came from electric power rates, grants, state programs, and integration into normal city budgets. These investments lead to...

Reduced Energy Costs - Portland municipal buildings save \$2.3 million per year from EE. Austin, by using EE, essentially "built" a 500 Megawatt (MW) conservation power plant at a fraction of the consumer cost and environmental impact of a traditional coal plant. Austin is currently working on its second conservation power plant.

Communications - Excellent websites include details on programs, customized fact sheets (e.g., on green building practices), reports, and case studies. All had award programs or on-line showcases for excellence in green building.

Training - Rather than emphasize EE and RE as topics themselves, resident and business training often focused on the human concerns of saving money, or sealing leaks for comfort, or on indoor air quality and health.

Inspections, Audits, and Measurement - Free or low cost energy audits and inspections are provided. Measurements and analysis help insure that RE and EE investments are cost-effective and popular with residents. Commissioning of buildings verifies that RE and EE equipment is installed and operating properly.

Efficiency Rebate Programs - These were often targeted to specific reductions in peak electricity use, with efficiency rebates set as a fraction of the projected cost of building the next power plant.

Renewable Programs - Programs include both green energy purchasing programs and rebates for resident sited solar.

Green Building - Lead by example. Start with city-owned buildings to develop local expertise. Green building was then encouraged generally with assistance, rebates, grants, award programs, and some regulation.

Multi-family Building Programs - Programs focused on the needs of renters and apartment owners.

Income Qualified Programs - Recognizing that low income residents most need the comfort and money savings from EE, but can least afford it, these cities provide additional incentives for EE for qualified-income residents.

New Businesses. New Jobs - Several cities are working to specifically attract clean RE & EE businesses. The money saved on energy bills, as well as the money spent on EE & RE programs produce jobs locally (rather than in remote coal mines and power plants).

Green roofs - Chicago and Portland have green roof programs for the benefits of energy savings, urban heat island reduction, rainwater retention, air quality improvement, and beautification. Interestingly, even with its hot and dry climate, Austin is now researching green roofs.

What follows is a city-by-city look at the programs Austin, Chicago, Fort Collins, and Portland use to save money and improve the lives of their residents by investing in renewable energy and energy efficiency programs.

This document was written with city managers and staff in mind. Nevertheless, we hope that many people find it useful, particularly those responsible for improving energy quality while reducing energy costs in their communities, and those that want to make their cities more sustainable.

Because of the many weblinks embedded in this document, it is best viewed as an Adobe Acrobat "PDF" file on your computer. You may download this document from:

<http://rnc.sierraclub.org/energy/library/sustainablecities.pdf>

Quick Comparison

CITY	ELECTRICITY PROVIDED BY	POPULATION	RAINFALL (INCHES)	COOLING DEGREE DAYS	HEATING DEGREE DAYS
Austin	Muni	650,000	33	3015	1687
Chicago	IOU	2,890,000	36	940	6176
Fort Collins	Muni	130,000	15	479	6367
Portland	IOU	530,000	37	371	4522

Note that Portland is trying to purchase its IOU and turn it into a co-op or muni.

IOU = Investor Owned Utility. A corporation provides electricity to the city.

Muni = municipally owned utility. A publicly (city) owned utility provides electricity.

Cooling Degree Days = a measure of how much cooling someone living in that city might want. The higher the number the more time air conditioning would be wanted. Austin has the highest need for air conditioning.

Heating Degree Days = a measure of how much heating someone living in that city might want. The higher the number the more time heating, for example a furnace, would be wanted. Austin has the lowest need for heating.

<http://www.worldclimate.com/define.htm>

Austin

Population 650,000. Metropolitan Area: 1,250,000. Land area: 272 sq. miles. Rainfall: 33 inches per year. Cooling degree days: 3015. Heating degree days: 1687. Seven council members are elected. Council selects a city manager.

Electricity is provided by the municipally-owned Austin Energy (AE). Natural gas is provided by the Texas Gas Service.

Peak electricity load occurs on weekday afternoons in the summer.

Leadership

EE and RE programs began in 1982. Austin is working toward being the “Clean Energy Capital of the World.” The Austin City Council, Austin Energy, the Chamber of Commerce, and the University of Texas actively participate in the city’s renewable energy programs. The Chamber has a Clean Energy Council to expand on the region’s alternative energy industry. The original impetus came from then city council member, and present Deputy Manager of Austin Energy, Roger Duncan.

A Plan

Austin Energy’s strategic plan goes into detail on the whys, whats, hows, and programs to achieve its vision and mission.

Vision: “We want Austin to be the most livable community in the country.”

Mission: “To deliver clean, affordable, reliable energy and excellent customer service.”

Austin Energy’s primary objectives for its service area are: excellent customer satisfaction, to create and sustain economic development, provide exceptional system reliability, maintain financial integrity, and a strong commitment to a renewable portfolio standard (RPS). The RPS is viewed as integral to the other objectives through its reducing both costs and electricity supply cost risks.

The plan states: “we have two measures for our energy resource objective. Our first measure is to achieve a renewable portfolio standard of 20% by 2020. For our second measure, we intend to achieve an energy efficiency target of 15% also by 2020.”

<http://www.austinenergy.com/About%20Us/Newsroom/Reports/strategicPlan.pdf>

Austin

Funding

As a municipal utility, Austin Energy is funded through the inclusion of costs in customer rates. However, any increased costs due to efficiency measures or renewable initiatives are being offset by the decreased rates associated with not having to build new power plants. The utility obtains grants and low and zero interest loans through state and federal programs.

Reduced Energy Costs

Over time, the combined decreases in energy demand associated with efficiency and renewable programs have saved the city from electricity needs equal to the annual output of a 500 megawatt power plant. Through thoughtful application of such measures, Austin has in essence built a “conservation power plant” instead of an actual coal fired plant. A plant of that size can power 50,000 homes.

The real-cost savings are well illustrated by measures taken within the city’s schools. AE managed and implemented a retrofit program for the school district on 40 schools (3.5 million square feet). Combined total costs were \$3.8 Million. The state provides low interest loans for this kind of project. Combined rebates (similar to rebates offered to all customers) were \$0.6 million, thus saving the district \$480,000 per year in energy costs. The payback is 6.9 years on energy costs alone. In addition to reducing energy usage, the retrofits improved bad lighting and reduced maintenance problems and cost.

Communications

AE has an excellent Website - easy to use and informative.

Online case studies can be found at
http://www.ci.austin.tx.us/greenbuilder/mcs_toc.htm

AE’s Green Building Newsletter helps keep contractors and others interested in green building up to date.



Training

Contractors are trained and qualified in order to be recommended by AE for EE and RE work. Ongoing training is provided through monthly contractor meetings.

Inspections, Audits, and Measurement

Energy audits are free to everybody - all rate classes. In some cases energy audits are offered to renters as well (see below).

Austin

Austin Energy inspectors do pre and post inspections for EE and RE installations to insure quality.

Building commissioning is becoming increasingly important in Austin. For example, IBM was so pleased with the energy savings from commissioning one of their buildings that they want more of their existing buildings commissioned.

Efficiency Rebate Programs

AE is attempting to save an additional 40 to 50 MWs of load every year through efficiency.

EE programs are targeted to the different needs of residential, small, or large business customers. For public schools and Austin municipal buildings, Austin Energy provides both rebates and project management services through the use of inter-local agreements. Schools and the city pay Austin Energy for their service above and beyond the services normal commercial and residential customers receive.

Large businesses are audited for free by Austin Energy auditors. The rebate level is set to \$250 per kW peak capacity saved. Large businesses then have the necessary work completed through their normal contractor network.

Small businesses are also offered free energy audits by Austin Energy auditors. But because they do not typically have a person or group devoted to facilities or energy, AE handles the post-audit retrofitting in a more hands-on nature. After an audit, small businesses need only sign a contract to pay 20% of the costs and AE does the rest. Austin Energy has agreements with pre-selected contractors who do the work. The contractor receives 80% of their reimbursement from AE directly. The 20% cost paid by small businesses is often recouped in electric bill savings in the first year. To maintain a balance between large and small business efficiency customers, small customers had to receive a higher incentive — about \$400 per kW peak saved.

About 60% of commercial rebates go toward lighting.

Rebates are based on the kilowatts (kW) of peak demand reduced over normal or code equipment. The full cost of new fossil fueled generation is about \$1500/kW (about \$550/kW capital costs, balance for operations, maintenance, and fuel). Since the costs of EE are between \$250 and \$400 per kW, this is a win-win situation for customers and a power company determined to keep costs low.

New construction qualifies for rebates where equipment exceeding Austin's standard building code requirements is used.

Residential efficiency rebate programs are handled by contractors trained and certified by AE. The customer calls the contractor, the contractor performs the audit and submits a bid proposal to AE. AE then reviews the bid and approves it after an on-site visit. A residential customer can choose rebates on a cash basis, or can choose a zero percent loan from a local credit union arranged by AE.

AE provides a \$35 incentive for residents to remove and recycle working old refrigerators and freezers.



Austin

One key to the success of Austin Energy's efficiency programs is marketing. Marketing programs vary by types of accounts. Successful marketing often hinges on creating a sense of urgency in the minds of customers. To accelerate EE adoption, AE has offered occasional "sales" on rebates where the level is 20% higher for commercial customers than normal up to a cutoff date.

Coupons for immediate discounts on compact fluorescent lighting at home improvement and hardware stores have also been a high-profile success. These coupons are displayed on the racks or bins where the light-bulbs are kept.

Renewable Programs

Solar

Austin's goal is to install 100 MW of solar facilities by 2020.

AE incents residential solar electric installations through a \$5/watt rebate. This covers 50 to 80% of installation costs.

AE has contracted for low interest loans with very friendly terms at a local credit union.

If the cost of solar from a utilities standpoint is 10 times the cost of a new power plant, or more than 20 times the cost of EE programs, why do it? Why has Austin committed to 100 MW of solar by 2020? AE's answer comes in two parts: first, to encourage clean economic development; and second, to prepare the utility for the widespread adoption of solar technology as solar prices continue to fall.

AE knows that the current rebate fails to reflect an amount based strictly on economic benefits to AE and solar customers alone. What they don't know, however, is how much the rebate level should be if it takes into account the full value of solar generated electricity. They are studying this now.

The response to the renewables program has been "amazing" and much stronger than expected from the economic incentives alone.

Wind

AE offers its GreenChoice program, which allows customers to purchase the benefits of wind power. The program is slightly different for residential and commercial customers. Residential customers can opt in and out of the program. Commercial customers, on the other hand, must make 5 or 10-year commitments. Commercial customers nevertheless find GreenChoice quite attractive in part due to the strong promotion they receive from their participation in the program, including billboard and Television advertising. Also, a commercial customer pays a fixed price for the 5 or 10-year period rather than being subject to a fuel charge. Since fuel charges have been rapidly increasing, companies are given a way to lock in energy prices and avoid the risk of future price increases.

In 2004, GreenChoice was recognized as the largest green power purchase program of any U.S. utility.

<http://www.eere.energy.gov/greenpower/markets/pricing.shtml?page=3>

Austin

Green Building

The City of Austin started the first Green Building Program in the U.S. in 1991. Operated by Austin Energy since 1998, the program evaluates the sustainability of residential single family, multi-family and commercial buildings using locally developed rating tools or the USGBC's LEED program. In addition to evaluating the level of sustainability of buildings, program staff provide plan review and recommendations, individual consultation on products and systems, and assistance in applying for incentives or assistance from other City departments or programs to the construction industry. The program provides monthly seminars on various Green Building topics for industry professionals.

In addition to working with industry to develop a supply of green buildings, the program works with the public to develop demand for more green homes and offices. The Green by Design workshops are held quarterly and still attract full houses of 80 to 100 people after more than three years. Ads and articles written by program staff promoting the benefits of green building and builders who have participated in the program during the previous year are run in the local media.

AE offers a voluntary program for builders to acquire a Green Building star rating for their new construction. Builders are trained, then fill out a checklist. AE inspectors visually check that the items listed in the checklist are installed. In the last year, 1,087 homes - 25% of new, single family construction - were star rated in Austin Energy's service area.

As of 2000, all new city-owned buildings must be at least LEED Silver standard.

The redevelopment of the now closed Robert Mueller Municipal Airport will contain over 5 million square feet of commercial space and over 4,000 residential units when built out. All commercial buildings must meet either a LEED Silver standard or attain 2 stars on the Austin Energy Green Building Program's Commercial Rating tool. All housing must meet an Austin Energy Green Building three star level.

AE's website features approximately 30 fact sheets addressing a variety of green building options from Air Filters to Windows. They were written specifically for the Austin environment, and are intended for both home and business owners. Case studies and other educational information can also be found on the website at:

<http://www.ci.austin.tx.us/greenbuilder/>

The Sustainable Building Sourcebook is another valuable tool found on the AE website. The Sourcebook is designed to educate and inform all readers, but is directed specifically to motivated laypersons and those with a sound knowledge of building trades and terminology. Like the fact sheets, the Sourcebook is written specifically for Austin and contains information on regulatory issues, climate, installation guidelines, and sources of assistance.

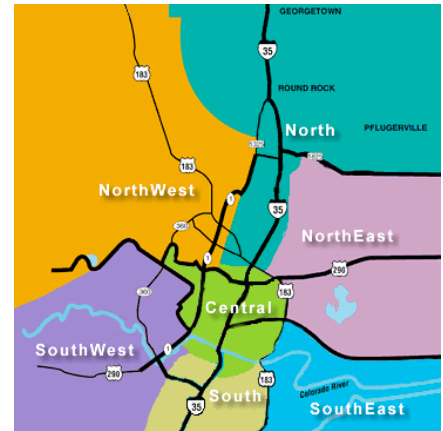
http://www.ci.austin.tx.us/greenbuilder/srcbk_1.htm

Austin

Multi-family Building Programs

40% of AE's customers live in rental housing. Many of these rental units are in multi-family buildings.

AE's website has an apartment finder that helps perspective renters find energy efficient apartments. This resource provides a strong incentive for property owners to implement energy efficient measures on their rental units. Other incentives for multi-family building owners include lower operating costs, increased occupancy, increased market values, and rebates up to \$100,000.



Energy Efficient Apartment Finder

For their part, tenants see utility savings of up to 40%, improved air quality, and a higher level of comfort.

More than 40,000 apartment units throughout Austin have received rebates for energy investments through the Multi-Family Program totaling over five million dollars.

http://www.austinenergy.com/Energy%20Efficiency/Tools%20and%20Tips/residentialEnergy%20Efficient%20Apartments/multi_family.cfm

Income Qualified Programs

Free programs are available to income qualified homeowners and to renters who have been in a home, mobile home, or duplex for a year. Covered programs include: insulation in attics, ductwork sealing, caulking, weather stripping, and installation of solar screens for shading.

<http://www.austinenergy.com/Energy%20Efficiency/Programs/Free%20Home%20Energy%20Improvements/index.htm>

New Businesses. New Jobs

Austin Energy created an economic development incentive to bring solar manufacturing to Austin. The solar rebate is increased to \$6.25 per watt for solar installations that use solar equipment manufactured in Austin.

The renewables program itself caused the number of Austin-based registered solar installers to increase from 3 to 8 in one year.

Green roofs

While Austin's climate is hot and dry, AE is nevertheless looking into the possibility of green roofs for the advantages of reducing the urban heat island effect. "Cool roofs" with light colored surfaces are strongly encouraged.

Chicago

Population: 2,890,000. Metropolitan Area: 8,400,000 Land area: 228 sq. miles. Rainfall: 36 inches per year. Cooling degree days: 940. Heating degree days: 6176. Mayor is elected. City Council consists of 50 Aldermen.

Sustainability as a major goal started in 2000.

Electricity is provided by the investor-owned ComEd. ComEd is a division of Exelon Corporation. Natural gas is provided by Peoples Energy.

Peak load occurs mid-day during the summer.

Chicago is a member of the Chicago Climate Exchange. While the city does track its greenhouse gas emissions, it does not trade them, preferring to bank or retire them.

<http://www.chicagoclimatex.com/>



Leadership

Mayor Richard M. Daley's oft-stated goal is for Chicago to become "the most environmentally friendly city in America." Mayor Daley has suggested that "encouraging environmental innovation will be beneficial for the health of both our citizens and our economy. Conserving natural resources, and encouraging environmentally efficient behavior from citizens and businesses, not only ensures the sustained health of the City but it also makes plain common sense. Why be wasteful when we can save? Save environmental resources, tax payer dollars, business costs and the quality of life in our great neighborhoods."

"Leading by example" is Chicago's intent. The city has established aggressive goals for city and allied agency buildings, including a target of 20 percent municipal electricity from renewables by 2005, and an envisioned 30% reduction in environmental footprint by 2020.

Investor-owned electricity provider ComEd appears to share this leadership: "At ComEd we recognize the importance of balancing the need for reliable energy with our responsibility to ensure that the quality of our environment is preserved."

A Plan

In 2005, Chicago released an 80-page Environmental Action Agenda: Building the Sustainable City. The comprehensive and detailed plan is divided into 17 functional areas - Airports to Waste and Recycling.

Chicago

There are three primary strategies within the agenda:

1. Conserving, protecting, and restoring natural resources.
2. Encouraging healthy environmental practices.
3. Leading by example.

Each functional area has sections for Mission, Accomplishments, Action Agenda for 2005, and Action Agenda for 2010/2020.

Part of this plan is a commitment to “develop ‘life-cycle cost assessment’ tools and data in addition to a first cost analysis method for budgeting.”

http://egov.cityofchicago.org:80/webportalCOCWebPortalCOC_EDITORIAL/EnvActionAgenda.pdf

Funding

Initial funding was helped greatly by a 1999 settlement agreement with ComEd for \$100 million. The settlement came about after power failures during major heat waves in 1995 and 1999 resulted in hundreds of deaths.

EE & RE projects are paid for via the settlement fund, together with grant monies, funds from the city budget, and other funding mechanisms.

Additional funding of \$6 million was negotiated within the Chicago municipal franchise agreement with ComEd.

This was used partially to fund the Chicago Solar Partnership.

<http://www.chicagosolarpartnership.com>

Reduced Energy Costs

The City is in the process of auditing and retrofitting 15 million square feet of public buildings with efficient equipment for heating and cooling, lighting and ventilation. Energy savings are estimated to be \$6 million annually. In addition, the retrofits will reduce annual pollution significantly — an estimated 30,000 tons of carbon dioxide, 84 tons of nitrous oxides and 128 tons of sulfur dioxide.

Communications

Chicago has an excellent website providing easy access to city programs and reports.



<http://www.cityofchicago.org/Environment/GreenTech/>

and

<http://www.cityofchicago.org/Environment/GreenTech/sub/how.html>

Chicago

Training

On-line surveys and residential EE fact sheets are available from the REAP (Residential Energy Assessment Program) website.

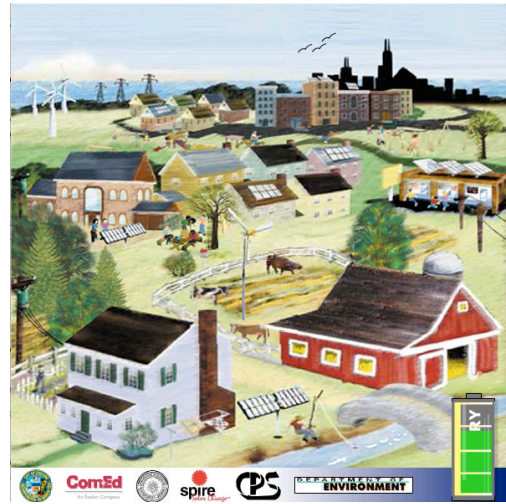
<http://erc.supergloo.net/tips.htm>

The city offers Boiler Efficiency and Motor Master workshops, along with more than 40 other free seminars at Chicago's "Green Tech U" on green building and sustainability topics. These seminars are held in the nation's first LEED Platinum certified renovated building. Green Tech U has served almost 2000 professionals and other Chicago residents.

<http://www.cityofchicago.org/Environment/GreenTech/>

Chicago places an emphasis on teaching kids about solar. Curriculums and on-line interactive diagrams and quizzes have been developed for young students.

http://www.chicagosolarpartnership.com/teaching_tools/index.htm



Inspections, Audits, and Measurement

Chicago plans to have an integrated global building management system for all city buildings in order to monitor, measure, and control energy usage.

The city is also working towards commissioning all city-owned buildings.

Efficiency Rebate Programs

The Industrial Rebuild Program (IRP) is a partnership of the City of Chicago Department of Environment (DOE), ComEd, the University of Illinois at Chicago's Energy Resources Center and the Illinois Waste Management and Research Center (WMRC). The program helps the most energy- and waste-intensive industries in Chicago become more energy efficient.

The partnership optimizes its effectiveness by focusing on one industry at a time. Over the program's three-year life, the IRP has targeted the metal casting, chemical, and confectionary industries. Companies in identified sectors are given free energy and pollution assessments, which include suggested improvements in energy efficiency, pollution prevention and water conservation. An estimated cost/benefit analysis is then produced for each suggested improvement. A revolving loan program offers low- or no-interest loans for implementing energy conservation measures. The loan program is tied to renewable energy goals. The City offers 0% interest loans to companies that purchase 5% of their electric energy use from renewable energy (e.g., wind power). Not only does this program help companies become economically competitive by reducing their energy use, it helps create a market for renewable energy in the city. IRP anticipates energy savings in the neighborhood of 10% to 25%.

Chicago

Renewable Programs

Citywide, Chicago currently has 1.2 MW of installed solar electric systems. 2.5 MW of solar thermal is being installed for solar pool heating, domestic hot water, and space heating in fire houses, aging centers, health centers, and police stations. Chicago's goal is to produce 10 MW of renewable energy by 2010.

In addition to Chicago's direct purchase of renewables, the city helps build demand for renewable technology through implementation of the Industrial Rebuild Program detailed above.

Rebates are available for solar electric systems from the state and from ComEd. These work out to about \$3.50 per watt for a 2 kW residential system.

Green Building

Because city buildings are expected to have a 100-year life, the city has made a huge commitment to designing and building superior new structures. The mindset is that it is in the city's own best interests for its buildings to be extremely energy efficient. In addition, green buildings use less toxic materials and generally provide nicer work environments than traditional structures.

A single general services department provides expertise in green building and efficiency for all city departments.

If a commercial builder takes city money under a grant program for a new building, their end-product must have a green roof, be ENERGY STAR® compliant, or be LEED certified.

In 2004, the city adopted the "Chicago Standard," requiring that all new and renovated city-owned buildings be LEED certified.

The Green Bungalow Program renovated four abandoned bungalows for moderate income ownership. Energy-efficient and environmentally sustainable rehabilitation techniques incorporated into the project afforded energy savings of up to \$1,050/year. Drawing considerable public attention, the program was publicized through newspaper and magazine articles, websites and conference presentations. Over 2,000 people have toured the homes.

The Green Homes Design Competition was a collaboration between the City of Chicago, Neighborhood Housing Services of Chicago, and others, to build and sell energy-efficient, environmentally-friendly and affordable homes. The competition selected five homes from seventy-three entries. The homes were open for tours, and are still open for virtual tour on Chicago's website.

Mayor Daley's GreenWorks Awards were created to recognize outstanding examples of green building in Chicago's private sector.

Chicago's Green Permit Program (GPP) is an express building permit process for ENERGY STAR or LEED buildings. GPP can reduce the number of days for a building permit from a typical 3 months to as little as 15 business days - the greener the building, the better the benefits. In addition, Chicago is identifying, and working to eliminate, building code barriers that unnecessarily impede building green.

http://egov.cityofchicago.org/webportalCOCWebPortalCOC_EDITORIALGreenPermitbrochure.pdf

Chicago

Multi-family Building Programs

Most of the multi-family EE activity in Chicago has been aimed at either city-owned or managed properties. 63 multi-family buildings - or 1,447 units - have been rehabbed since 1988. Seven new multi-family buildings - 570 units - have been built so as to maximize energy efficiency. Results include an average space heating reduction of 50%.

Income Qualified Programs

Working with other agencies, the city has created the New Homes for Chicago Program.

The award-winning New Homes for South Chicago project is being developed by Claretian and Associates in partnership with the Chicago departments of Housing and Environment. This 25-home project incorporates many energy efficiency features. For example, the homes are constructed with Structural Insulated Panels (SIPs). Half the homes will also include solar electric (Photovoltaic) systems. Funded and supported by a variety of grants and programs, the goal was to make this project as green as possible. Lessons learned so far include that SIPs, while more expensive to buy, in fact cost out lower than standard construction framing due to reduced labor and waste cost.

<http://www.lisc-cnda.org/2005.php?recipient=claretian>

The Green bungalow program provided affordable housing and is described in the Green Building section above.

New Businesses. New Jobs

Chicago has succeeded in attracting companies to the area as a direct result of its concerted sustainability effort. Three companies that stand out are:

- The Chicago Climate Exchange (greenhouse gas emission trading program)
- Spire Corporation (manufacturer of solar electric panels)
- Solargenix Corporation (manufacturer of solar thermal systems). Solargenix was encouraged to come to Chicago with a startup loan and a procurement commitment (so many MWs of solar thermal per year).



Chicago

Green roofs

Green roofs are seen as a way to cut costs in several ways. First, they reduce heat in generally densely populated areas (reducing “urban heat islands”). Since air conditioning (particularly cooling) equipment is generally situated on the roofs of most structures, roof temperatures impact the efficiency of A/C units directly. Chicago’s City Hall has a park-like green roof (see cover photo). Green roofs help alleviate this problem by keeping the air temperature on the roof much cooler than traditional roof materials. Green roofs also help with issues of storm runoff by slowing the flow of rainwater and are believed to be longer lasting than more traditional roofing systems.

In Chicago, floor area bonuses may be granted for green roofs and other types of improvements.

Eight projects have received density bonuses for constructing green roofs.

150 public and private green roof projects have been installed totaling over two million square feet.

There is a green roof grant program for small residential and commercial projects of up to \$5000.

http://egov.cityofchicago.org/webportalCOCWebPortalCOC_EDITORIALFlyer_1.pdf



Urban heat island in Baton Rouge, La. (Source: EPA)

Fort Collins

Population: 130,000. Land area: 50 sq. miles. Rainfall: 15 inches per year. Cooling degree days: 479. Heating degree days: 6367. The mayor and six city council members are elected.

Demand side management programs started in 1980. Greenhouse gas planning and management began in 1997.

Electricity is provided by the municipally owned City of Fort Collins Utility department. Gas is provided by the investor owned utility Xcel Energy.

Peak load occurs during the late afternoon in the summer.



Leadership

Fort Collins city council has a long history of innovation in EE and RE.

Most programs are implemented by the city-owned Fort Collins Utility. Electricity demand side management programs began in 1980. For example, see the ZILCH program below.

Fort Collins Utilities became the first utility in Colorado, and the second utility in the nation to offer an optional green priced wind program in 1998. Greenhouse gas planning and management activities were added in 1999. The city council adopted an Electric Energy Supply Policy in 2003, which raised electric rates to fund EE & RE programs. This policy is having a big impact in energy sustainability. The goals and accomplishments of this policy may be found at: <http://www.fcgov.com/utilities/powertosave/energygoals.php>

The city council continues its long-term leadership in sustainability with the 2004 formation of the Economic Vitality and Sustainability Action Group (more below).

A Plan

Fort Collins adopted a Local Action Plan to Reduce Greenhouse Gasses (a greenhouse gas management plan) in 1999. <http://www.fcgov.com/airquality/lap.php>

This plan requires Fort Collins to "... implement municipal greenhouse gas reducing activities ... so as to reduce local greenhouse gas emissions by at least 30% below predicted 2010 levels ..." The plan goes into detail on programs and anticipated savings from those programs.

This led to the Electric Energy Supply Policy adopted by City Council in 2003.

<http://www.fcgov.com/utilities/energypolicy.php>

Fort Collins

The policy's objectives "are to maintain high system reliability, maintain competitive electric rates and reduce the environmental impact of electricity generation." The policy's targets are to "reduce per capita electric consumption 10 percent and per capita peak day electric demand 15 percent... Renewable energy use is targeted to increase to 2 percent in 2004 and 15 percent by 2017."

The city owns and runs its own distribution grid, and, with 4 other cities, owns the Platte River Power Authority to provide for the generation and transmission of electricity. The expectations and goals for this plan are that efficiency and renewables will reduce bills, delay the construction of new power plants, increase local economic development from redirected energy cost savings, and provide cleaner air, all while delivering high reliability with low electric rates.

Fort Collins' city council formed an Economic Vitality and Sustainability Action Group (EVSAG) in 2004. Reports, links to workshops, etc. may be found at:

<http://www.fcgov.com/economicvitality/>

"Sustainability is the long term social, economic, and environmental health of our community. A sustainable community remains healthy without compromising the ability of future generations to meet their needs. Quality human-scale urban design, energy-efficient building practices, economic health, diversity of housing, public safety, environmental protection, and mobility will all make Fort Collins a sustainable community." (from the EVSAG I report.)



Funding

Funding was significantly increased in 2003 from a 1% increase in rates dedicated to electrical efficiency programs and a 1% increase in rates dedicated to renewables. Even with these rate increases, Fort Collins enjoys rates that are lower than Colorado's other investor-owned utilities. Each 1% provides about \$700,000 per year in funding.

The expectation is that whereas rates may increase initially, total expenditures (measured by rates times consumption), will stay the same or go down because energy efficiency and renewables will help reduce consumption.



Reduced Energy Costs

"The energy consumption reduction targets of the Electric Energy Supply Policy are expected to save Fort Collins customers over \$40,000,000 between 2004 and 2012."

<http://www.fcgov.com/utilities/powerertosave/eebenefits.php>

Fort Collins

The cost to the utility of helping customers save energy is about 1.7 cents per kWh. The cost to the utility of providing energy is about 3.7 cents per kWh. In Fort Collins, therefore, it costs twice as much to provide electricity to the city's consumers as it does to save it.

Communications

The city's award winning website is straightforward, easy to use, clear, and quick. (2004 Best of the Web)

<http://www.fcgov.com/news/index.php?ID=092004090410011>

Case studies of energy efficiency projects can be found at

<http://www.fcgov.com/utilities/powertosave/casestudies.php>

"The Power to Save" campaign is an umbrella slogan used for all EE programs in the city.

Training

For students, the "Energy Rules" program teaches lessons on energy conservation and renewables:

<http://www.fcgov.com/utilities/edu-energy.php>

Businesses may attend free talks in the Environmental Program Series. Each half-day talk covers a topic in some detail. Topics have included air conditioning, lighting, motors, cooling towers, best practices in green building, etc.

<http://www.fcgov.com/utilities/powertosave/events.php>

Past presentations may be downloaded from:

<http://www.fcgov.com/utilities/business-eps-presentations.php>

The city helps sponsor, and contributes to, an annual weekend long Sustainable Living Fair.

<http://www.sustainablelivingfair.org/>

Inspections, Audits, and Measurement

Businesses receive free energy assessments from the utility:

<http://www.fcgov.com/utilities/powertosave/energyassessment.php>

For homes, the Fort Collins Utility administers the ENERGY SCORE program.

Qualified private contractors perform complete energy audits, for which the utility provides a \$50 discount.

<http://www.fcgov.com/utilities/powertosave/energyscore.php>



The utility also encourages commissioning. For a good description of the commissioning process, visit:

<http://www.fcgov.com/utilities/powertosave/commissioning.php>

Fort Collins

Efficiency Rebate Programs

A variety of money saving programs, including clothes washer and air conditioner rebates, compact fluorescent light-bulb buy-downs, and a bounty for recycling inefficient refrigerators and freezers, are aimed at meeting Fort Collins' goal of a 10% increase in overall energy efficiency by 2012.

<http://www.fcgov.com/utilities/powertosave/inyourhome.php>

<http://www.fcgov.com/utilities/powertosave/business.php>

Fort Collins Utilities provides zero interest loans to homeowners for energy improvements through its ZILCH (Zero Interest Loans for Conservation Help) program.

<http://www.fcgov.com/utilities/zilch.php>



Fort Collins Utilities works collaboratively with its electricity supplier PRPA to provide up to \$500 per kW Demand Side Management reductions in peak summer electric load relating to lighting retrofits and motors and air conditioning upgrades.

<http://prpa.org/productservices/dsmmain.htm>

Renewable Programs

Fort Collins' goal for renewables is to have 15% of the city's energy derived from renewable sources by 2017. In 2004, the city (city-owned buildings, residences, and businesses) had achieved 2.4% renewables. The existing renewable programs are funded in part by a 1% increase in rates for renewables and also through a voluntary wind purchase program.

In 2004, the Platte River Power Authority reduced the rates for the voluntary wind program from 2.5 cents per kWh to 1 cent per kWh to better reflect the actual costs of wind power production.

The city is looking into options for solar power starting with a pilot project on net metering, which would allow the utility to analyze full data on photovoltaic generated power. In a more broad sense, the utility is looking for ways to streamline interconnection issues and encourage conservation, renewables, and customer-generated power (e.g., solar, or combined heat and power plants)

Green Building

The Integrated Design Assistance Program provides consulting and financial assistance on new commercial buildings. The program encourages integrated design and commissioning with the vision of achieving energy savings in excess of 20% beyond code requirements.

<http://www.fcgov.com/utilities/powertosave/indesign.php>

All new city-owned buildings will be built to at least LEED Silver standards. Fort Collins' first Silver standard building was completed in 2005.

Fort Collins

From a builder's perspective, new home energy efficiency is supported with the on-line Builder's Guide to Energy Efficient Home Construction.

<http://www.fcgov.com/electric/builders-guide/index.htm>

New home purchasers can find excellent information in an easy to use format at:

<http://www.coloradonewhomechoices.org/home.htm>

The buyer's guide and the questions PDF on the Colorado new home website are worth a close look.

<http://www.coloradonewhomechoices.org/buyersguide/default.htm>

<http://www.coloradonewhomechoices.org/questions/questions.pdf>

A comprehensive study of New Home Energy Efficiency was completed in 2002 and may be downloaded from:

<http://www.fcgov.com/utilities/pdf/newhome-eval.pdf>



Multi-family Building Programs

This is an area where the utility expects to do more in the future.

Income Qualified Programs

Free weatherization services for income qualified residents are part of the REACH program (Residential Energy Assistance through Community Help).

<http://www.fcgov.com/utilities/reach.php>

New Businesses. New Jobs

The EE programs have created new businesses and jobs. For example, Energy Solutions Unlimited, a lighting supply company specializing in energy efficient retrofits, has established its primary place of business in Fort Collins.

Green roofs

Cool roofs (light or white colored roofing material) are recommended as part of the city's green building programs. Due to the area's relatively scant rainfall, however, Fort Collins has not invested significant resources in promoting green roofs thus far. This may change if programs in arid regions (e.g., in Austin) demonstrate any benefits of green roofs

Portland

Population: 530,000. Six-county metro area: 1,900,00. Land area: 134 sq. miles. Rainfall: 37 inches per year. Cooling degree days: 371. Heating degree days: 4522. The mayor and 4 city commissioners are elected at large.

Electricity is provided by the investor-owned Portland General Electric (PGE) and PacifiCorp. PGE is currently for sale by Enron (in bankruptcy). The city of Portland is attempting to buy PGE to make it into a municipal utility or cooperative.

Peak load occurs in the early evening during the winter.

Leadership

In 1979 the city adopted an energy policy - one of the first, if not the first in the country, to emphasize energy efficiency and renewables.

Implementation of this energy policy and related policies addressing green building, recycling, sustainable procurement, and global warming is coordinated by the Office of Sustainable Development (OSD). OSD's "mission is to provide leadership and contribute practical solutions to ensure a prosperous community where people and nature thrive, now and in the future."

The goal: The "City of Portland will promote a sustainable future that meets today's needs without compromising the ability of future generations to meet their needs, and accepts its responsibility to:



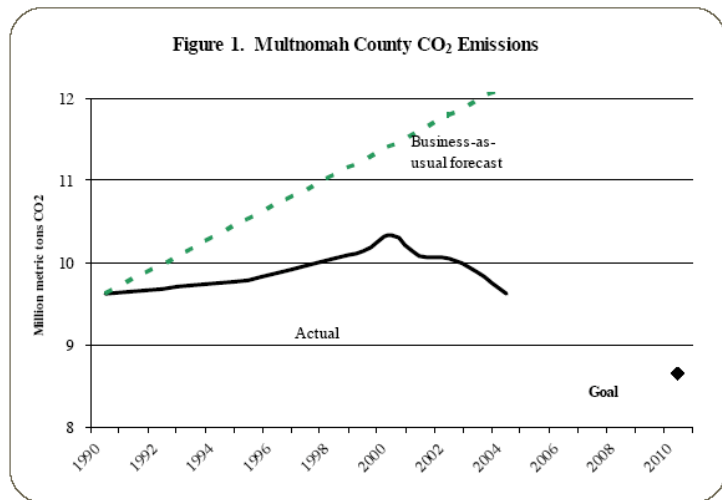
- * Support a stable, diverse and equitable economy.
- * Protect the quality of the air, water, land and other natural resources.
- * Conserve native vegetation, fish, wildlife habitat and other ecosystems.
- * Minimize human impacts on local and worldwide ecosystems."

These principles also establish requirements for elected officials and city staff.

http://www.sustainableportland.org/greenpages/Sustainable_Principles.htm

Key questions for the energy piece of the sustainable puzzle are: “How can we use less energy? Should we build more power plants? Can we find new, cleaner, energy sources? How will our energy choices affect the air, water, and soils?”

Portland, the county seat of Multnomah County, is working with the County to reduce greenhouse gas emissions to 10% below 1990 levels by 2010. To date, progress is extremely encouraging. A June, 2005 Progress Report showed that GHG emissions in Portland were less than 1% above 1990 levels in the face of both population and economic growth.



Portland is truly a world leader in energy sustainability!

http://www.sustainableportland.org/osd_pubs_global_warming_report_6-2005.pdf

A Plan

The Local Action Plan on Global Warming is Portland’s guiding document for achieving its 2010 GHG objective. This is Portland’s second GHG plan the first having been issued in 1993.

<http://www.sustainableportland.org/Portland%20Global%20Warming%20Plan.pdf>

This comprehensive plan addresses global warming and includes specifics on GHG emissions in Portland. It “identifies five primary components with specific greenhouse gas reduction targets and a sixth element - Policy, Research, and Education - that will enhance the success of the other five strategies but is not credited directly with quantifiable reductions.” Each component is broken down into objectives and actions. The five areas in which Portland explicitly contemplates GHG reductions are:

- A) Policy, Research, and Education
- B) Energy Efficiency in Buildings (0.67 million metric tons CO₂ reduction)
- C) Transportation, Telecommunications, and Access (1.35 million metric tons)
- D) Renewable Energy Resources (0.54 million metric tons)
- E) Waste Reduction and Recycling (0.23 million metric tons)
- F) Forestry and Carbon Offsets (0.31 million metric tons)

Local emissions are inventoried annually, and a comprehensive progress report was issued in June 2005:

<http://www.sustainableportland.org/default.asp?sec=osd&pg=pubs>

Portland

Funding

One of the early programs Portland adopted was the City Energy Challenge. This is an internal tax, or systems benefit charge, which takes 1% from each city department's energy bill to fund internal-to-the-city-government technical assistance for energy efficiency projects. The program has a \$15,000 cap, but nevertheless faced some early skepticism. Resistance subsided, however, as each department realized energy savings much larger than program's costs.

Approximately 8% of the Office of Sustainable Development's funding comes from the city's general budget. Funding is applied strategically to maximize grants.

Some programs require cost-sharing. For example, apartment owners pay the lion's share of energy retrofits.

The Energy Trust of Oregon is funded by a statewide Systems Benefit Charge (SBC) that began in 2001. The Energy Trust funds energy efficiency and renewable energy projects in Oregon. Following the SBC's initiation, utilities could no longer recover costs on DSM programs through rates.

The Energy Trust of Oregon is funded by a statewide Systems Benefit Charge (SBC) that began in 2001. The Energy Trust funds energy efficiency and renewable energy projects in Oregon.

<http://energytrust.org/>

The Climate Trust provides funds for greenhouse gas offset projects all over the world. Portland has received grants from the Fund for a number of its initiatives - traffic signal optimization, the Multifamily Assistance Program, Internet based carpool matching, and the Commercial Green Buildings Program. The Climate Trust is primarily funded through a state law requiring new fossil fuel burning electricity generating power plants in Oregon to offset carbon emissions up-front. The program receives additional funding from other state and utility carbon-offset initiatives as well as contributions from individuals and companies. Projects are listed at:

http://www.climatetrust.org/offset_projects.php

A carbon calculator and donations page may be viewed at:

<http://www.carboncounter.org/index.php>

Prior to funding from the Energy Trust (financed by an SBC), some programs (e.g., the Multifamily Assistance Program) were funded by the local utilities as part of their Demand Side Management efforts. Prior to 2001, the Oregon Public Utilities Commission deemed DSM as cost-effective, or "prudent," and allowed utilities to use rates to recover costs for DSM programs. Utilities in Oregon may no longer recover DSM expenses in rates.

In addition to the above, Oregon offers substantial tax credits for energy and building efficiency. These tax credits may be "passed through," or transferred from one entity to another. This enables organizations with no tax liability, such as non-profits and local governments, to take advantage of the tax-based incentives by trading credits to entities that pay taxes. (In the past these organizations were sometimes able to access the benefits of the tax credits by, for example, leasing energy-efficiency equipment from entities with tax liabilities. The lessor would then qualify for the tax credits, thereby sharing in the financial benefit with the non-profit or government entity).

Another state law encourages subsidized bus passes.



Portland

The City of Portland's Green Investment Fund pools capital from the Energy Trust of Oregon and the City's water, wastewater, and solid waste divisions to provide grants for innovations in building green.

<http://www.green-rated.org/gif.asp>

Reduced Energy Costs

The City Energy Challenge saves Portland an estimated \$2.3 million per year on its governmental energy bills.

Over the next ten years, the four programs funded under the Climate Trust are expected to relieve the city of approximately 0.5 million metric tons of CO2 emissions. The savings realized from these programs for the most part go to car owners and businesses benefiting from reduced energy use.

Over the past ten years, Portland has helped weatherize 20,000 apartments and 2,000 low-income homes.

Communications

Exceptional websites provide ready access to programs, reports, case studies, and incentive programs. The two primary resources are the "G Rated" site for green building, and the Office of Sustainable Development's website.

<http://www.green-rated.org>

<http://www.sustainableportland.org/>

The reports found here are particularly worth investigating

<http://www.sustainableportland.org/default.asp?sec=osd&pg=pubs>

Portland has been recognizing outstanding sustainable businesses since 1993 through its Businesses for an Environmentally Sustainable Tomorrow (BEST) awards.

http://www.green-rated.org/prog_bestawards.asp

The Cool Portland Campaign is a prototype program launched in 2001, under which five to eight people - neighbors, friends, coworkers - formed teams that met three times over a 30-day period. The teams utilized a step-by-step workbook and a trained volunteer coach to reduce GHGs from their lives. The teams achieved average reductions of 6,300 pounds.

http://www.sustainableportland.org/stp_glo_cool.html

Training

The ReThink Green Building Training Certificate program runs for 5 months. This education program uses case studies and features residential and commercial tracks. ReThink provides training and support for architects and builders seeking to maximize energy efficiency. ReThink also educates participants on how to best utilize state provided grants and tax credits for given projects. Expert-led tours and classes explore high performance design as integrated



Portland

into local projects. This year, ReThink adds a series of Design Forum evening lectures by nationally distinguished architects and urban designers.

http://www.green-rated.org/prog_rethink.asp

TravelSmart is a marketing and training program that encourages use of alternate transportation. Initial contact with Portland citizens begins with a letter, followed by a phone call asking: "Do you regularly bus or bike?" If the contact responds either "yes," or "no and never will ride the bus," the call is concluded with a thank you.



If the contact responds with "sometimes, but x, y or z," then TravelSmart staff works with these people to help explain schedules, provide information, or even arrange a home visit. By providing a high level of assistance to a small number of people, the program was able to reduce car trips by 8% among occasional alternate transit users. Doing so optimizes use of the existing alternate transportation system while avoiding the need to add more busses or bike lanes. TravelSmart markets the program with freebies like umbrellas, etc.

<http://www.trans.ci.portland.or.us/Options/TravelSmart.htm>

Fix-It Fairs are neighborhood-based training programs that connect residents with resource conservation information and assistance. Portland organizes about 3 such events each year. Fix-It Fairs feature concurrent sessions on a variety of topics and typically take place in neighborhood schools. The events are advertised via flyers sent home through the schools and by direct mailings. The Fix-It Fairs are well attended, sometimes attracting up to 500 people. Topics focus on health and comfort rather than energy savings. For example, during a "drafty rooms" lecture, trainers tell their audience about caulking cracks and other techniques to reduce drafts, alluding to financial and energy savings only as added benefits to comfort.

http://www.sustainableportland.org/energy_res_fix.html

Inspections, Audits, and Measurement

Portland Energy Conservation, Inc. (PECI) is a city spin-off non-profit that performs building commissioning to verify that building systems are working properly. Almost without exception, the building systems PEGI evaluates are NOT working properly. PEGI thus charges building owners a fee to provide consulting and to find and fix problems on their properties. Many building owners in Portland see this as a way to save building operation money.

<http://www.peci.org/>

Free energy audits are provided through the Energy Trust of Oregon.

Residential energy and water use self-audit information and program listings can be found at

http://www.sustainableportland.org/greenpages/All_Around_My_House.htm

and

<http://www.sustainableportland.org/greenpages/bathroom.htm>

Portland

Efficiency Rebate Programs

Portland mandates the procurement of ENERGY STAR® office equipment for all city purchasing.

Extensive (among the most comprehensive in the nation) rebate programs are provided through the Energy Trust of Oregon.

<http://www.energytrust.org/residentialindex.html>

Renewable Programs

Portland has been buying green tags for city departments since 1995. Currently about 11% of the city's electricity comes from green tags, micro hydro systems in the water system, plus the use of waste gas from wastewater treatment in fuel cells and microturbines.

Portland is currently soliciting bids for a partner to build a wind farm that would provide electricity for all of the city-owned facilities and operations. The expectation is that the costs in the first year will not exceed current electricity costs and that by contracting for 15 to 20 years, the city will insulate itself from any future electricity price increases. The 50 MW (approximate) wind farm would provide 100% of municipal electricity needs on average, essentially weaning the city's dependence on non-renewable sources of electricity production (not residents and businesses).

Rebates for the installation of solar electric, solar hot water, wind, biopower, and other innovative renewables are available through the Energy Trust of Oregon:

<http://www.energytrust.org/RR/index.html>

As required under state law, Portland residents and businesses may purchase green power from their electric utilities through a voluntary customer-choice program. Currently, 7.8% of all Portland residents and businesses buy green power from their utility.

Green Building

Portland's extensive green building programs can be accessed at:

<http://www.green-rated.org/default.asp>

Programs range from financial incentives and technical assistance to green home tours, which allow 750 people to see and appreciate tangible applications of the latest green building innovations up close and in person.

Case studies for residential and commercial buildings can be found at:

http://www.green-rated.org/cs_list.asp?md=residential

http://www.green-rated.org/cs_list.asp?md=commercial

A guide for green home remodels is at:

http://www.green-rated.org/publications_list.asp?cat=grg

Intended for companies leasing or moving into new spaces, the book, *G/Rated Tenant Improvement Guide -- Creating a High Performance Workspace*, is available for free download from:

Portland

http://www.sustainableportland.org/osd_public_guide_jan_2004.html

Portland LEED is a city-specific extension of the U.S. Green Building Council's LEED standard. Information on Portland LEED is available from:

http://www.green-rated.org/p_leed.asp

Multi-family Building Programs

The Multi-family Assistance Program assists apartment owners with maximizing the benefits of Energy Trust grants and state tax credits. More than 10,000 multi-family units have been weatherized under the program since 2001.

http://www.sustainableportland.org/energy_menu_Mul.html

Income Qualified Programs

Low to moderate income apartment dwellers can get up to 100% funding from the Energy Trust of Oregon for energy efficiency projects.

New Businesses. New Jobs

PECI is detailed above, under the "Inspections" section. Other notable Portland-area businesses related to sustainability include Green Building Services, Quantec, Stormwater 360, and PPM Energy, along with many others. A large number of green architectural, building, and installation firms are based in Portland. While those firms may benefit from Portland's sustainable focus, they also help drive Portland's mission towards increased sustainability.

The Northwest Green Directory, an on-line database of regional green products and services, includes hundreds of sustainability-oriented firms and products. Visit the directory at:

<http://www.nwgreendirectory.com/>

Green roofs

EcoRoofs (Portland's term for Green Roofs) are recommended by the city. Portland's interest in green roofs comes mostly from the great potential for stormwater runoff benefits, but also from the possibility of achieving modest energy and heat-related benefits. Reducing the urban heat island effect is not a concern in Portland's relatively cool climate.

Acknowledgements

This report would not have been possible without the kind support of many people including: Austin Energy's Roger Duncan, Jerrel Gustafson, Fred Yebra, Ed Clark, Richard Morgan, and Ester Matthews; Michael Armstrong from Portland's Office of Sustainable Development; John Bleem from the Platte River Power Authority, John Phelan and Patty Bigner from Fort Collins' Utilities; Andrea Love and Mike Johnson with the City of Chicago, and Kathy Kelleher with Claretian & Associates.

Special thanks to John Rosapepe from the Sierra Club who provided the original idea and funding for this report.

Finally, a heartfelt thank you to my editor, Jason S. Wells.

Resources

In addition to the web links listed throughout this report, some other excellent sources of information were found on best practices in cities:

Selected Best Practices for Successful City Energy Initiatives

http://www.usmayors.org/uscm/news/press_releases/documents/bestenergy2001.pdf

Energy Efficiency Best Practices

<http://www.eebestpractices.com/index.asp>

The Environmental Protection Agency's ENERGY STAR Program is responsible for helping the U.S. save enough energy to power 24 million homes while saving \$10 billion. All four of these cities are ENERGY STAR Partners.

http://www.energystar.gov/index.cfm?c=partners.pt_index

Cities interested in sustainability should consider joining the Public Technology Institute's (PTI) Sustainability Council. PTI is a non-profit organization that helps identify best practices for cities and counties. Their library contains many documents for setting up programs and systems for financing and accounting for EE and RE.

<http://www.pti.org/>

While this report barely touched on issues of sustainable transportation, transportation needs must be addressed in all municipal settings in order to achieve any significant level of sustainability. In addition to a variety of forms of mass transit, Plug-in Hybrid Electric Vehicles (PHEVs) are increasingly seen as a key component of our sustainable energy future. Austin is organizing a number of cities to encourage auto manufacturers to develop PHEVs further and faster. For more information on Austin's efforts, visit:

<http://www.pluginaustin.org>

A PHEV is just like a regular Hybrid Electric Vehicle (HEV, such as the Toyota Prius) except that, unlike any HEV available today, PHEVs can plug-in to any normal electrical outlet and recharge a larger battery pack. Once charged, a PHEV can travel a certain number of miles (e.g., 20) as an electric vehicle with zero emissions. Even after calculating in the emissions PHEVs contribute via electricity generation, they are cleaner and produce less carbon dioxide than the same gas operated HEV. When its charge runs out, a PHEV behaves exactly like a normal HEV.

PHEVs can be set to charge late at night when electric rates are low and, in some places, when wind resources are high. With the right resources, PHEVs can even be set to charge from solar during the day. More information on PHEVs is available at:

<http://calcars.org/>

About the Author

Ken Regelson is the owner of Five Star Consultants. Ken provides analysis and cost-effective approaches to the use of policy and practice to create a more sustainable energy future. Areas of expertise include utilities, net metering, municipalization, renewables, energy efficiency, and city and state policy and practice in RE and EE. He has been very active in the passage, rulemaking, and implementation of Colorado's Amendment 37 - a renewable portfolio standard passed by the citizen's of Colorado in 2004. Ken's clients include the Sierra Club, the City of Boulder, the Colorado Energy Science Center, the Center for Resource Conservation, the Colorado Solar Energy Industries Association (CO-SEIA), and others. He lives and works out of a solar powered home in Boulder, Colorado.

regelson@mac.com

303-449-4890

This report may be downloaded from:

<http://rnc.sierraclub.org/energy/library/sustainablecities.pdf>

Cool Cities

If your city isn't already a Sierra Club "Cool City," please consider joining our campaign to help solve global warming one city at a time.

<http://sierraclub.org/globalwarming/coolcities/>

