Best Practices for Climate Protection

A Local Government Guide

•I•C•L•E•I
International Council for
Local Environmental Initiatives

Table of Contents

Introduction

Heatwaves, storms, floods and other disastrous weather events have focused world attention on the serious threat that global warming poses to local communities. This Guide provides examples of currently available, cost-effective technologies and practices that cut the pollution causing global warming, while at the same time save money, create jobs, and improve the livability of our communities.

What is Global Warming? The gases that make up the Earth's atmosphere are in a delicate, natural balance. The ability of these gases to trap the sun's heat has long been recognized as a natural "greenhouse effect" that makes the earth habitable. Recent human activity has put too much of certain greenhouse gases into the atmosphere. This imbalance is enhancing the natural greenhouse effect and causing the planet to heat up.

An increase in average world temperatures of only two or three degrees appears possible over the next century. Scientists believe that this amount of global warming will cause dramatic changes in the Earth's climate, resulting in extreme weather with devastating environmental and economic consequences. Changes in climate and weather patterns threaten the infrastructure upon which cities and counties depend. Sea levels are expected to increase between 7–39 inches by the end of the century, enough to inundate thousands of miles of coastal areas. Higher average temperatures could promote an increase in ground-level air pollution—or smog—resulting in increased human health problems such as asthma and other respiratory ailments.

The major greenhouse gas (GHG) emissions in urban areas are carbon dioxide (CO_2) and methane (CH_4). Carbon dioxide is emitted when fossil fuel-based energy (including electricity derived from the burning of fossil fuels) is used by households, institutional and commercial buildings, auto transportation, and industry. Methane is emitted in urban areas as waste decomposes in landfills and from wastewater and sewage treatment processes. Scientists around the world have called for swift action to curb the greenhouse gas emissions accelerating global warming.

What Can Local Governments Do? Local governments control many of the day-to-day activities that determine the amount of energy used and waste generated by their communities. In this manner they can change energy consumption patterns and greatly impact the emissions of global warming pollution. For example:

- Local governments make land use and development decisions that determine the density and physical layout of communities, influencing how much people drive
- Local building codes determine the energy efficiency of houses and commercial buildings
- Local waste reduction and recycling programs affect how much waste goes to landfill
- Local governments determine the existence and adequacy of public transit, which in turn determines the degree to which residents must rely on private automobiles

Purpose of this Guide. This Guide highlights some of the many innovative practices local governments throughout the U.S. are implementing to exercise this authority and reduce global warming pollution. While many cities and counties acknowledge the direct threat climate change poses to their communities, preventing climate change is not the only reason U.S. municipalities have engaged in the types of activities included in this Guide. They are also enacting climate protection measures because of the local economic and environmental benefits that accrue from reducing energy consumption—better air quality, job creation, financial savings, and community livability. This Guide provides a sampling of the many innovative and cost-effective measures U.S. cities and counties are implementing to reduce their contributions to global warming and improve the quality of life in their communities. While certainly not an inclusive list of all the climate protection activities local governments are undertaking, these Practices demonstrate the great potential for global warming prevention through local action.

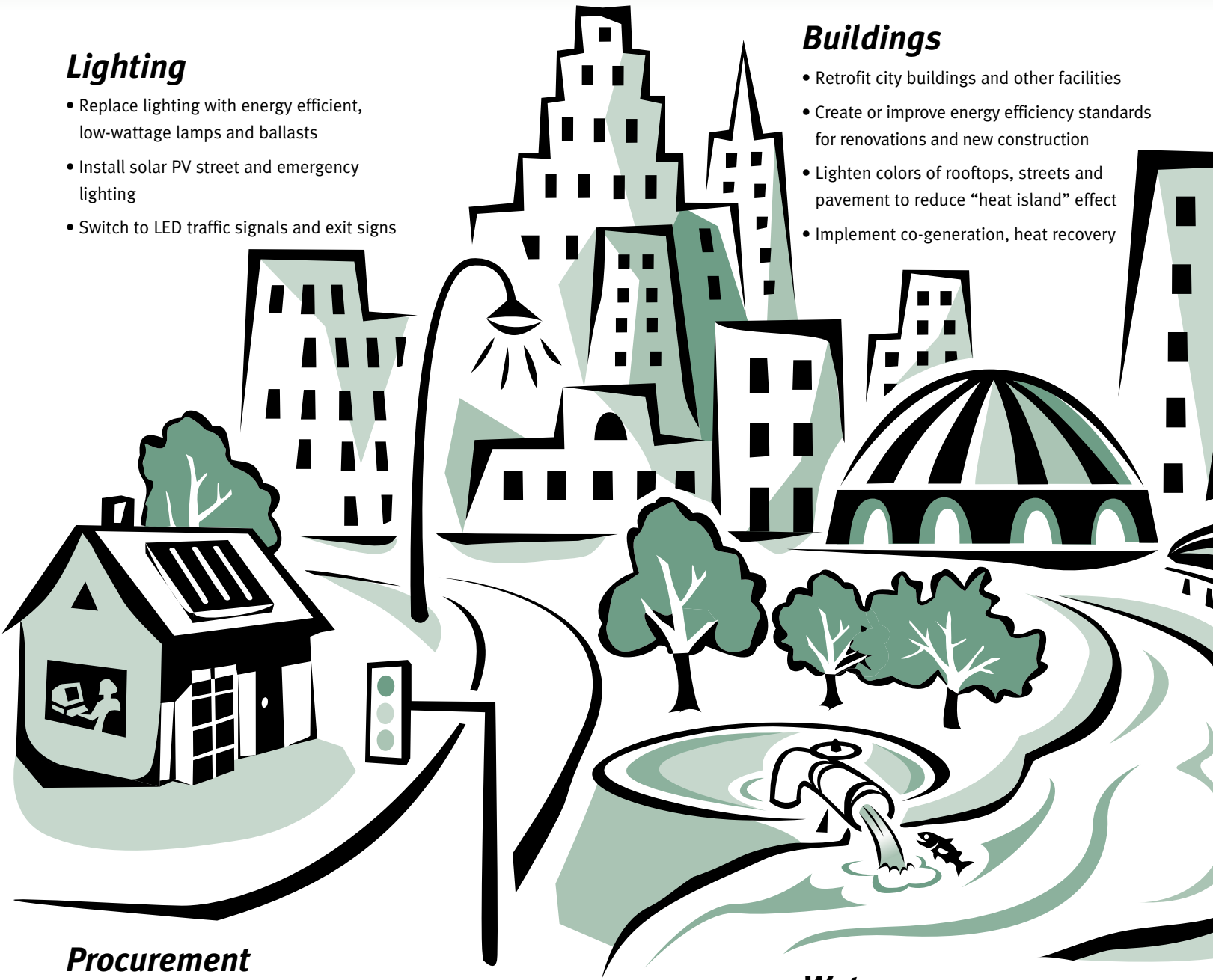
Reducing Greenhouse Gas Emissions from Local Government Buildings and Operations

Lighting

- Replace lighting with energy efficient, low-wattage lamps and ballasts
- Install solar PV street and emergency lighting
- Switch to LED traffic signals and exit signs

Buildings

- Retrofit city buildings and other facilities
- Create or improve energy efficiency standards for renovations and new construction
- Lighten colors of rooftops, streets and pavement to reduce "heat island" effect
- Implement co-generation, heat recovery



Procurement

- Specify energy efficiency standards in purchasing and bid specs for office and heavy equipment

Water

- Increase efficiency of facilities and pumping processes
- Improve energy efficiency of processes for wastewater and sewage treatment

Waste

- Increase office recycling—paper, cardboard, cans, toner cartridges
- Buy products with recycled content
- Recover landfill methane and produce energy

Fleet

- Reduce total number of vehicles
- Downsize current and future vehicles
- Require higher fuel efficiency for each vehicle class
- Replace on-the-job driving with telecommunications, mass transit, biking, walking, and carpooling
- Give incentives to reduce city employee driving—transit passes, preferred parking for carpools, vanpools

Power Supply

- Purchase "green power" for local government operations
- Implement or participate in district energy programs

Retrofit City Buildings

- Reduce energy consumption in municipal buildings
- Save money
- Reduce CO_2 emissions

Comprehensive Upgrade of City Buildings—Toledo, OH

Results in the First Year

- 20 City buildings retrofitted
- Cut electricity use by 5,823,000 kWh
- Cut natural gas use by 111,892 ccf
- Reduced 5,250 tons CO2
- Saved $710,208 in the first year

In order to reduce energy use and comply with air quality and CFC regulations, Toledo undertook comprehensive retrofits of 20 city buildings and facilities. Energy efficiency upgrades were completed for the municipal court, garages, sewer maintenance, health, police, and fire departments. In addition to reducing energy use and cutting costs, these retrofits reduced global warming pollution associated with electricity and natural gas use.

Energy saving measures in Toledo's program include installing energy efficient lighting and motion sensors. Old HVAC units were replaced with new digitally controlled boilers and chillers. The new chiller system eliminates CFC refrigerants and has replaced 170 window air conditioners with one central air conditioning system. Improvements have also been made to facility management systems (FMS), allowing maintenance staff to diagnose potential problems from a single location, and making it easier to respond promptly to comfort and maintenance issues.

Innovative Financing. The City of Toledo sold bonds to finance the program, contracting with a systems controls company to do the improvements. The contract guaranteed that energy savings would pay back the bonds—any shortfalls were covered by the controls company and any savings accrued to the city. This financing system has allowed building improvements of over $10 million to be installed with no out of pocket expenses. Annual results of the program have already exceeded the contractor's guaranteed energy savings.

Key Contact

Tim Murphy
Climate Wise Coordinator
City of Toledo, OH
419.936.3768

Similar Projects

Chicago, IL's municipal buildings retrofits,
Steve Walter, 312.744.8222

Set an Efficient Energy Code

- Reduce municipal energy use
- Save money on city utility bills
- Improve occupant comfort and building value

Sustainable Energy Standard—Tucson, AZ

Roughly 35% of U.S. CO_2 emissions come from energy use in residential and commercial buildings. Energy codes are the most direct mechanism for local governments to impact this energy and cut the resultant pollution.

Tucson and surrounding Pima County are the only jurisdictions in Arizona that apply minimum efficiency standards to building construction. In Tucson, all buildings must meet the Model Energy Code (MEC) of 1995, a national standard for minimum insulation, window glazing, lighting, and other similar features related to energy efficiency. In 1998, the City of Tucson decided to set the bar even higher than the MEC. Since then, all construction and renovation of municipal buildings has been placed under Tucson's own "Sustainable Energy Standard," which requires an impressive 50% greater energy efficiency than that of the Model Energy Code.

An Inclusive Process. Tucson's Sustainable Energy Standard originated as part of an environmentally friendly neighborhood development called Civano, which first required the 50% efficiency premium. Builders found the savings surprisingly easy to achieve, convincing Tucson that the standard could work in all city construction. The Sustainable Standard suggests various conservation measures but allows architects freedom in choosing exactly how to meet the higher efficiency standard. Designers must detail conservation strategies and perform an energy analysis early in the design process. The City then monitors energy efficiency throughout the contracting, inspection, and testing phases. This process ensures that all involved, from design to construction, understand the importance of energy efficiency and ensures that the savings are realized.

Annual Results

- $73,000 a year saved through avoided utility costs
- 784 tons of CO2 reduced annually
- Annual savings will grow as more renovation and construction is completed

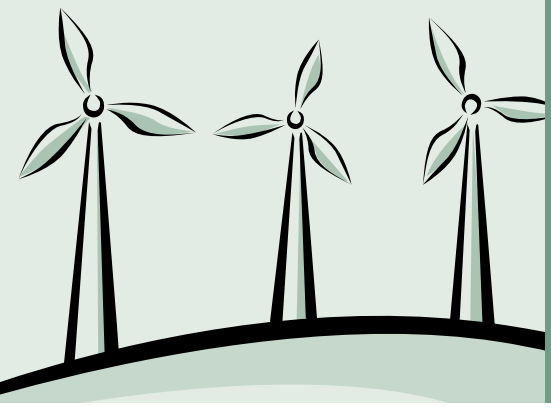
Citywide Savings

The Sustainable Energy Standard now applies to the roughly 50,000 square feet of new City construction and 50,000 square feet of space the City renovates each year. Tucson is also looking beyond municipal buildings for more energy savings. The City is applying the Sustainable Energy Standard citywide as a voluntary standard and hopes to begin a citywide training program for architects and contractors in applying energy codes and standards. These policies are helping Tucson reduce pollution, stimulate business in energy services, and save money on City operations.

Key Contact

Vinnie Hunt
Energy Manager
City of Tucson, AZ
520.791.5111 x311

Al Nichols
Metropolitan Energy Commission Chair
520.760.0380
www.tucsonmec.org



Buy Green Power

- Cut pollution from municipal electricity use
- Stimulate market for renewable energy
- Set an example for your community

Purchase Green Power for Municipal Operations
—Santa Monica, CA

Annual Results

- 5 MW 100% renewable power purchased
- Eliminates 13,672 tons CO2
- Cut 16.2 tons NO_x
- Cut 14.6 tons SO_x
- Cut 2,285 lbs. PM_{10}

Electric utility deregulation allows customers to choose their electricity provider. The City of Santa Monica took advantage of deregulation in California by purchasing entirely renewable electricity to power City facilities. Renewable or "green" sources of electricity such as wind, solar, and geothermal energy generate power without burning fossil fuels, avoiding global warming pollution. Despite concerns that not enough companies would respond to the City's Request For Proposals, Santa Monica was able to choose from 13 bids and among various electricity products.

Prior to switching to green power, Santa Monica was paying $2.2 million per year for 5 MW of standard grid electricity, only 11% of which came from renewable sources. In June 1999, the City began receiving 100% clean geothermal electricity. The additional cost to the City is approximately $120,000 per year—far less than the City expected and only a 5% increase over prior City electric bills. Spread across all departments, this cost increase has proven insignificant.

Outreach and Public Support. Santa Monica's green power purchase is only one part of its comprehensive Strategic Energy Plan. Promoting clean energy throughout the community is another high priority. Santa Monica tied educational efforts and public outreach events to its green power purchase. While soliciting bids for green power, Santa Monica surveyed residents and businesses and found widespread local support for renewable energy. Over 70% expressed interest in switching to a renewable energy provider if the price were within 5% of their current utility bill. This helped the City justify its expenditure. The City is also distributing consumer information on the benefits and opportunities for switching to green energy, including specific outreach to the School District, Santa Monica College, and other large institutional and commercial customers. Setting an example by buying green power for municipal needs helps Santa Monica convince residents and businesses to make the change as well.

Key Contact

Susan Munves
Resource Efficiency Coordinator
City of Santa Monica, CA
310.458.8229

Resources & Similar Projects

San Diego Association of Governments (SANDAG) has aggregated purchase of green power.

Madison, WI's Transit Agency is buying 25% of their electricity from wind power. If the program succeeds, Metro transit will purchase more wind power until the agency runs on 100% green power. Jayne Somers, 608.261.4298

Buy Energy Efficient Products

- Reduce municipal energy use
- Save money on utility bills
- Educate vendors and product users

Environmentally Preferable Products Procurement Program
—State of Massachusetts

U.S. State and local governments spend $30 to $40 billion a year on energy consuming products and equipment. By ensuring that these products are energy efficient, governments can reduce their energy bills while also cutting pollution from electricity generation.

In 1997, the State of Massachusetts began including Energy Star standards in its procurement specifications for computers, fax machines, copiers, printers, and other office equipment. Energy Star is a voluntary labeling partnership between the U.S. EPA and industry certifying and promoting energy efficient products. The Energy Star label makes it easy to identify products that save money and prevent pollution, and Energy Star products are available from almost all manufacturers at the same cost as more energy-intensive models. Thus the State of Massachusetts' procurement policy protects the environment without compromising quality or price.

Ensuring Compliance, Educating Vendors and Users. To ensure compliance, the State Procurement Department meets regularly with vendors to discuss contract issues and educate them on specifications and the goals of the program. In return, vendors are required to train their customers on Energy Star product features, the economic and environmental benefits of this equipment and the State's policy on energy efficient purchasing. Contracts also require vendors to enable all power-saving features at the time of shipment to ensure that energy savings are realized.

The State Environmental Procurement team has also developed educational materials on buying energy efficient products. These materials help other State and municipal offices replicate the program and integrate the State's purchasing efforts with its overall environmental goals. To ensure that maximum energy savings are achieved, the Procurement team specifically trains technicians and employees to not disable power-saving features. The State also works with customers to track savings and performance, enabling it to advertise its successes.

Results

- All office equipment and most appliances now purchased are energy efficient
- Each Energy Star computer and monitor eliminates nearly 1 ton of CO_2 per year
- Each Energy Star office product saves $15 to $25 per year in energy costs

Key Contact

Marcia Deegler
MA Environmental Purchasing Trainer
617.720.3356
www.magnet.state.ma.us/osd/enviro/enviro.htm

Resources

Visit the EPA Energy Star Purchasing website at *www.epa.gov/appdstar/purchasing*

Switch to LED Traffic Signals and Exit Signs

- Increase energy efficiency
- Lower maintenance cost
- Save money on energy bills

LED Traffic Signals and Exit Signs
—Philadelphia, PA and Overland Park, KS

Annual Results

Philadelphia's LED Traffic Signals

- Energy use cut by 83%, saving 64 million kWh annually
- CO_2 emissions reduced by 41,490 tons
- Maintenance requirements reduced by 6 times
- Energy savings of $800,000 annually

Overland Park's LED Exit Signs

- Electricity savings of 41,000 kWh
- CO_2 emissions reduced by 35 tons
- Energy savings of $2,750 annually

Light Emitting Diode (LED) technology for traffic signals and exit signs offers big energy savings over traditional incandescent lamps. LED signals also last much longer and fail less frequently, offering extra savings in reduced maintenance costs. Local governments using this technology are showing short payback periods. Additionally, local governments can put together group purchases to further reduce initial costs. More cost-effective green and orange signals are also constantly being developed.

Saving with LEDs. After a successful pilot project, the City of Philadelphia decided to install red LEDs in all 2,900 intersections (28,000 traffic signals). The new signals used 83% less energy and required six times less maintenance than incandescent lights. These savings amount to $800,000 annually and have a simple payback of about 4 years. The City has also installed 3-color LED signals at two major intersections and is planning to install them at 30 more this year.

Lit exit signs are required in all public buildings. Today over 100 million exit signs are in use throughout the U.S. consuming more than 30-35 million kWh of energy and costing $1 billion to operate annually. The City of Overland Park changed from incandescent lights to LED exit signs in all its municipal buildings. This project saves the City 41,000 kWh and $2,750 annually.

Financing LEDs. The City of Saint Paul, MN negotiated with its utility company and received a 0% loan to finance their LED projects. In addition, Saint Paul staff coordinated a group purchase with neighboring municipalities, obtaining the lowest LED signal prices in the country.

Key Contacts

Joseph Doyle
Street Lighting Engineer
City of Philadelphia, PA
215.686.5515

George Moody
Environmental Compliance Manager
City of Overland Park, KS
913.895.6108

Similar Projects

Saint Paul, MN and Santa Cruz, CA are also currently testing 3-color LED signals.

Green Your Fleet

- Optimize fleet size
- Minimize fleet vehicle travel
- Increase fleet average fuel efficiency

Green Fleets Program—Denver, CO

The City and County of Denver operates a combined fleet of 3,500 vehicles. Faced with rising fuel costs, increased air pollution, and Federal mandates to clean the city's air, Denver enacted the "Green Fleets" executive order on Earth Day in 1993.

Elements of a Green Fleet. As a result of this order, fleet managers must purchase the most cost-effective and lowest emission vehicle possible, while meeting operational requirements of the agency. In order to accomplish this goal, fuel efficiency standards are included in procurement specifications. The Green Fleets process also includes reducing vehicle size and eliminating old and underused vehicles. The effectiveness of the program is measured by fleet energy use and CO_2 emissions. Originally the program set targets of 1% and 1.5% annual average reductions in fuel expenditures and CO_2 emissions, respectively. After achieving substantial reductions the order was revised in 2000, and new goals were targeted to provide more flexibility.

Performance of Green Fleets is monitored by a review committee appointed by the Mayor. Because the necessary staff were already in place, the program has not resulted in significant additional expenses for the City. Authorities estimate that Green Fleets activities currently take up 20% of time of the Manager for Mobile Sources, 5% of Fleet Managers and Review Committee members time, and less than 3% of the Transportation Coordinator.

Results in 1999

- Offset the City's fleet growth by 10 vehicles and downsized 13 others
- Saved $40,000 in operation and maintenance costs
- Saved up to $100,000 in capital costs by not purchasing some of the vehicles requested
- Prevented the emission of 10-15 tons of CO2

Lessons Learned

- Education plays a critical role. Review committee officials need to become familiar with activities, requirements, and unique attributes of each agency
- Having a staff person dedicated to the Green Fleets mission, to keep track of information and hold agencies accountable, is a key element to success
- The role of a fleet is to allow employees to perform specific tasks. Many tasks can be done without vehicles, by sharing vehicles, or by using alternative travel modes

Key Contact

Deborah Kielian
Program Manager, Mobile Sources
City and County of Denver, CO
303.285.4064

Resources

ACEEE's Green Book: The Environmental Guide to Cars & Trucks, American Council for an Energy Efficient Economy, Washington, DC, published yearly.

Green Your Fleet, ICLEI—Cities for Climate Protection, Berkeley, CA, 2000. Visit ICLEI's Green Fleets website at *www.greenfleets.org*

Get People Out of Cars

- Reduce traffic congestion
- Improve air quality
- Discourage single-occupancy driving

Comprehensive Commuter Trip Reduction Program
—Los Angeles, CA

Annual Results

- Carpool program: 500,000 trips and 3,836 tons CO_2 reduced
- Vanpool program: 233,000 trips and 7,696 tons CO_2 reduced
- Transit incentives: 418,500 trips and 6,050 tons CO_2 reduced
- Telecommute program in 1998-99: 7,800 trips and 194 tons CO_2 reduced

Highlights of LA's Program

Parking policies in Civic Center

- free permits for carpool vehicles
- preferential parking for car- and vanpools
- 17-year wait list for seniority parking permits for solo drivers

Transit, car- and vanpool incentives

- $15 cash back to transit users
- subsidized vanpool vehicle
- rideshare matching service
- guaranteed ride home

Bicycle, pedestrian incentives

- bike and clothes lockers, showers at some city facilities

Work time adjustments

- flex time in most departments
- compressed work week
- telecommuting—work at home up to one day a week

Sixty-six percent of U.S. oil consumption is used for transportation, accounting for about one-third of U.S. carbon dioxide emissions. Getting people out of cars or into high-occupancy vehicles is thus a good way to achieve significant reductions in greenhouse gas emissions. In addition to being a major source of GHGs, motor vehicles also contribute to air pollution. About a third of all vehicle trips arise from commuting, which cause traffic congestion, smog, and frustration for all.

In order to alleviate traffic congestion, the City of Los Angeles devised a commuter trip reduction program aimed at discouraging solo personal vehicle use and encouraging transit, car- and vanpooling. The commuter program is offered to 38,000 City employees with a budget of about $1.6 million a year. The program operates in over 40 City departments, including 110 vanpools, 1,000 carpools and the City Telecommuting Program.

Innovative Financing: The Rideshare Trust Fund. The City of Los Angeles and its employee bargaining units agreed to a unique arrangement regarding commuter benefits and employee parking. Basically, it rewards the "good guys" (those who rideshare) and penalizes the "bad guys" (solo drivers). Parking fees from solo drivers are used to support rideshare programs. Parking permit fees go to the interest-earning Rideshare Trust Fund. Unlike typical "use-it-or-lose-it" budgets, unspent funds in one fiscal year carry over into the following fiscal year. The Commuter Services Office (CSO) then applies these monies to its entire program; the initiative is thus relatively insulated from the effects of year-to-year tax revenue shortfalls in the General Fund. Trust Fund expenditures are primarily directed toward subsidizing vanpools and employee transit passes. They also cover producing carpool matchlists, purchase and installation of bicycle lockers, and office expenses.

Key Contact

Jeanne A. Rogers
Manager, AQMD Compliance Section
City of Los Angeles, CA
213.485.6994

Resources

Commuting in the Greenhouse: Automobile Trip Reduction Programs for Municipal Employees, ICLEI—Cities for Climate Protection Policy and Practice Manual

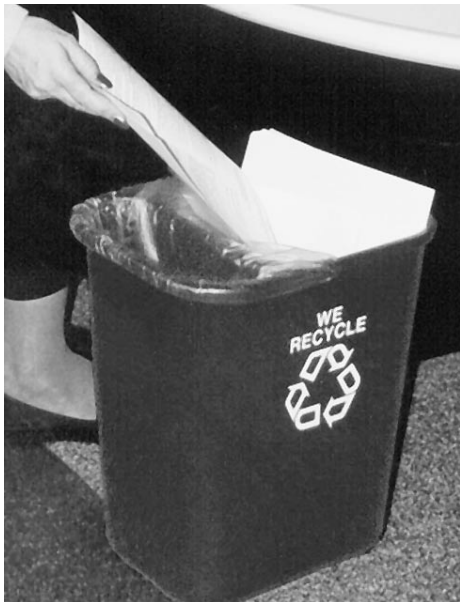
Reduce Municipal Office Waste

- Reduce waste going into landfills
- Reduce methane emissions
- Engage city employees in meeting waste Reduction goals

In-House Office Paper Recycling Program—Overland Park, KS

Pulp and paper production is the 5th largest industrial consumer of energy in the world, using as much power to produce a ton of product as the iron and steel industry. Paper production also produces high levels of air and water pollution—all to make a product that is usually used once and thrown away. In some countries, including the United States, paper accounts for nearly 40% of all municipal solid waste, the leading producer of methane emissions in this country.

Although the City of Overland Park has for many years had a relatively effective recycling program, there was still an opportunity to decrease the volume of waste paper going to the landfill. Waste bins used by City employees had a large compartment for non-recyclable waste, and a much smaller compartment for recyclables. Moreover, the City's Energy and Environment Management Team discovered that the recycling compartment was hardly being used—only about 10% of the eligible material was being recycled.



Following this review, deskside waste containers were changed to ones with a large compartment for recyclable material and a much smaller section for waste. Since the introduction of the new containers, the volume of recyclable paper in the solid waste stream has decreased by more than 70%, allowing the city to reduce solid waste collection fees by more than 30%, and recover the cost of the new containers in less than 12 months.

Results

- Volume of recyclable paper being thrown away reduced by 70%
- Total volume of municipal solid waste cut by over 30%
- Cut solid waste collection fees by 30%
- Costs recovered in less than 1 year

"Each year the United States sends more paper to the landfill than is used by all of China—the world's second largest paper consumer."

Worldwatch Institute, 1999

Key Contact

Jim Twigg
Special Projects Coordinator
City of Overland Park, KS
913.895.6273

Resources & Similar Projects

The Green Workplace program began in 1991, setting waste reduction targets of 35% by 1992 and 50% by 1995 for Ontario Government Offices. Success led to a new target of cutting waste by a further 50%. David Sparling, 416. 585.7541

Institute for Local Self Reliance's Waste to Wealth Program, Brenda Platt, 202.232.4108, *www.ilsr.org*

Use Fuel Cells to Convert Waste Methane to Energy

- Convert waste methane to energy
- Reduce criteria air pollutants
- Reduce methane emissions

Use Byproducts of Wastewater Treatment to Produce Energy—Portland, OR

Annual Results

- Reduces 694 tons of CO2
- Reduces 12,706 lbs. of NO_x
- Reduces 26,797 lbs. of SO_x
- Generates 1,400,000 kWh of "green" power
- Electricity bill savings of $92,000

The City of Portland installed the world's first city-sponsored anaerobic digester gas (ADG) fuel cell in its wastewater treatment plant in May 1999. The Fuel Cell Power Plant converts methane, a primary constituent of ADG, into electricity, generating power in a virtually pollution free operation.

Municipal wastewater facilities produce methane and carbon dioxide as natural by-products when solid waste decomposes during the treatment process. In its untreated state, ADG is corrosive, smelly, has low heat content, and is difficult to use as an energy source. If released directly into the atmosphere it is a potent greenhouse gas, trapping heat in the atmosphere at a rate 21 times more than CO_2.

Using Fuel Cells to Capture Methane. In many cities, half of captured ADG gas is flared before being released into the urban airshed. When this gas is burned, it represents wasted energy and a lost opportunity to reduce CO_2 and other combustion related emissions. Fuel cells can use the captured methane gas and convert it into electricity to power facilities. Added benefits are manifold—methane and criteria air pollutants are reduced, as is the amount of electricity purchased from utilities that operate fossil-fuel burning power plants, and the fuel is free because methane is produced during wastewater treatment.

Portland's Experience. Portland installed a 200 kW hydrogen fuel cell to help utilize its waste methane and reduce power plant air emissions. The result of this pilot installation is a net reduction of 694 tons of CO_2 annually—14,000 tons over the life of the fuel cell. Efficiency for generating electricity using a fuel cell is higher than most regional power plants at about 38% and when the usable heat is recovered, the rated efficiency climbs to 78%. The fuel cell displaces the need for emergency generators or un-interruptible power supply valued at $150,000.

Key Contact

Curt Nichols
Energy Office
City of Portland, OR
503.823.7418

Resources & Similar Projects

Calabasas, CA Wastewater composting facility is scheduled to bring two ADG fuel cells on-line in late 1999.

Hydrogen Fuel Cells: A Solution for Utilizing Waste Methane at Columbia Boulevard Wastewater Treatment Plan, City of Portland for US EPA

Building Financial Partnerships is Key to Project Success. Main partners include the local electric utility, the State of Oregon Business Energy Tax Credit Program, Oregon's Biofuels Program, and local lender Western Bank. The City's net cost was about $790,000 and the project was in part funded by US Department of Defense/Energy Fuel Cell Climate Change, $200,000, Portland General Electric, $247,000 and Oregon Office of Energy, $14,000. Portland's long range plan is to add additional hydrogen fuel cells or other technologies to produce clean, green power.

"For many local governments, finding an economic and clean use for surplus anaerobic digester gas from wastewater treatment plants remains a problem in search of an answer. Fuel cell power plants offer a viable solution as demonstrated by this project in Portland."

Susan Anderson
Director, Portland Energy Office

Use Landfill Methane for Energy

- Reduce reliance on fossil fuels for electric power
- Generate revenues from the sale of energy
- Provide an efficient, sustainable source of power for the future

Landfill Methane-to-Energy Facility—Austin, TX

Results

- Sunset Farms now generates 3 MW of electrical power—enough to supply 2,000 homes
- Total capacity when 6 new generators are on line will be 21 MW—enough for 14,000 homes
- Greenhouse gas emissions will be cut by 4.5 tons when all generators are on-line

Landfills produce methane gas as plant waste, wood, paper, and other organic materials buried in them decompose. Methane is a very powerful greenhouse gas and contributor to global warming. Therefore, controlling methane emissions from landfills is one of the most important actions a local government can take to help avert the threat of global warming. Collecting and using methane gas that escapes from landfills can also benefit local governments, as it can be used to produce electricity and generate revenue.

Recover Landfill Methane—the 4th R. The Sunset Farms Landfill in Austin, TX produces 2 million cubic feet of methane gas every day. In order to take advantage of this resource and to keep the harmful gas from reaching the atmosphere, the City entered into an arrangement with a private energy company to establish a methane-to-electricity facility in 1995. The facility has been so successful that the municipal utility in charge of the project, Austin Energy, is planning to open similar facilities at six other landfills in Texas—in Austin, Dallas, Galveston, San Antonio, and two in Houston.

Austin Energy is implementing the projects by entering into long-term, turn-key contracts with private energy companies to build and operate the facilities. This reduces risk and introduces competition. The private companies guarantee to supply the power at a fixed rate for ten years. The rates negotiated have been higher than current rates from conventional power plants—but lower than rates are projected to be in five years.

Landfill Methane is Green Energy. By reusing landfill methane to produce electricity, the project is offsetting the need to burn coal or other fossil fuels at a conventional power plant, thus further cutting GHG emissions. Beginning in 2000, Austin's "Green Choice" program will give consumers the option of paying 5% extra on their electrical bills now in return for a freeze on the fuel portion of their bills for the next ten years.

Key Contact

Mark Kapner
Austin Energy
City of Austin, TX
512.322.6123

Upgrade Water Treatment Processes

- Upgrade equipment and reduce energy use
- Reduce maintenance requirements
- Save taxpayers' money

Increase Efficiency of Lime Sludge Removal Processes— Saint Paul, MN

Saint Paul's water is drawn from the Mississippi River north of the Twin Cities. Water drains through a series of lakes and eventually into Vadnais Lake where it enters the water treatment system at the McCarron pumping station. Water is chemically treated to meet State health requirements and lime is introduced to soften water. When water processing is complete, lime residue is removed and soft water is piped to customers.

Getting the Sludge Out... The process of removing lime sludge is energy-intensive and the old technology used to spin out the lime was inefficient. As part of Saint Paul's Energy Conservation Project, new presses were installed to squeeze out the residue.

With Less Time and Money. The new presses use significantly less energy and remove 100% of the lime sludge, up from only 70% using old technology. New presses also handle sludge removal faster and demand less personnel time than the old system. The old system's run time was 24 hours/day; the new system's run time is 15 hours/day, saving wear-and-tear on equipment and reducing personnel demands. Old equipment demanded two full-time workers, while maintaining the new presses only requires one half-time worker. Financing for the new equipment was provided with a 0% loan from the power company, which is to be repaid through energy savings created by the new process.

Annual Results

- 1,173 tons annual reduction of CO_2 emissions
- 1.4 million kWh cut annually
- $250,000 annual savings

"The new presses used less energy, removed 100% of the lime sludge and demanded less personnel time than the old system ... they operated better than the City had expected."

James Haugen
Saint Paul Water Regional Services

Key Contact

James Haugen
Saint Paul Water Regional Services
City of Saint Paul, MN
651.558.2105

Resources & Similar Projects

The cities of Des Moines, IA and Richfield, MN have installed similar lime sludge removal systems.

Information on lime sludge dewatering can be found at *www.co.collier.fl.us/collierwater/dewateri.htm*

Reducing Greenhouse Gas Emissions from Your Local Community

Residential Sector

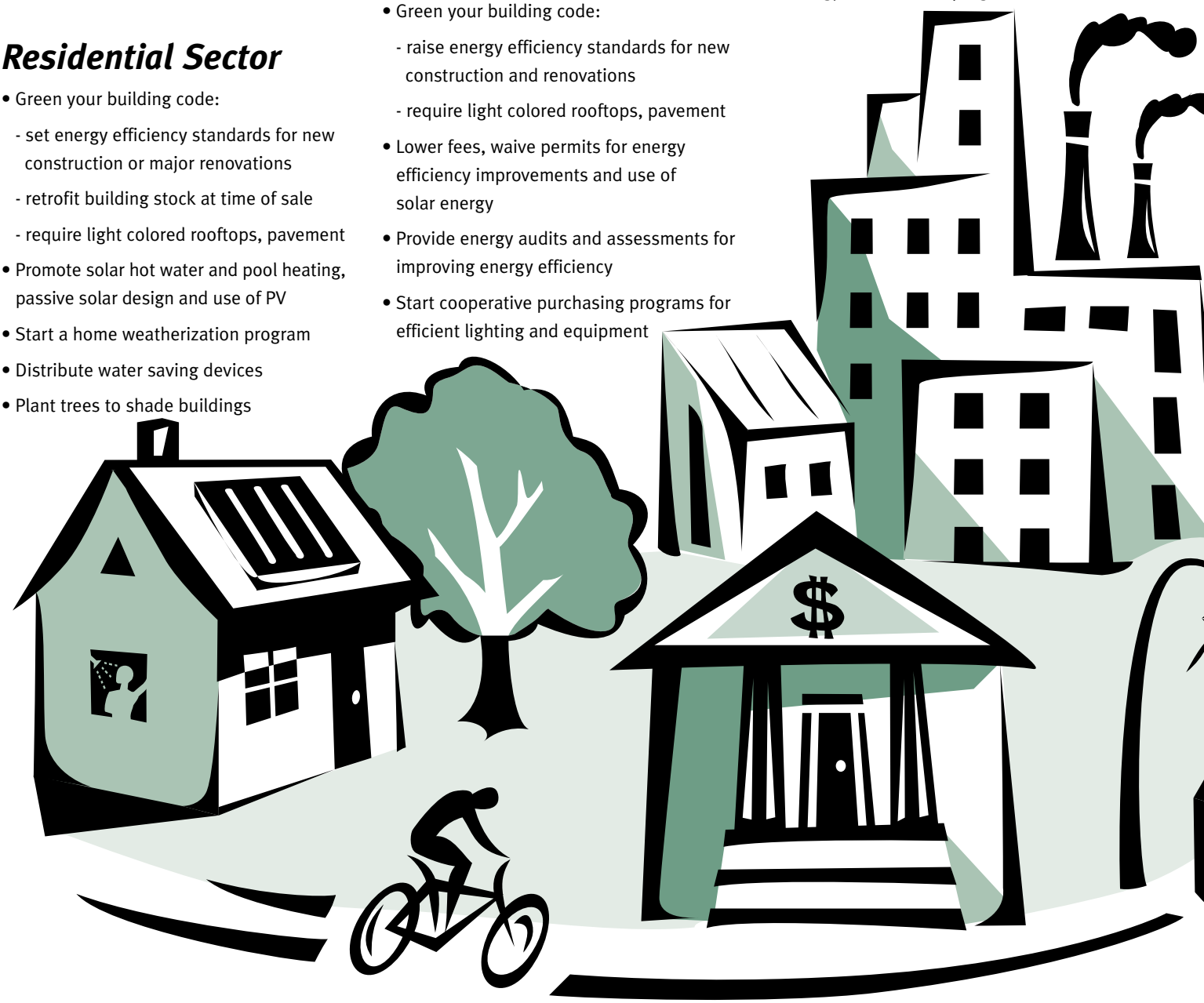
- Green your building code:
  - set energy efficiency standards for new construction or major renovations
  - retrofit building stock at time of sale
  - require light colored rooftops, pavement
- Promote solar hot water and pool heating, passive solar design and use of PV
- Start a home weatherization program
- Distribute water saving devices
- Plant trees to shade buildings

Commercial Sector

- Green your building code:
  - raise energy efficiency standards for new construction and renovations
  - require light colored rooftops, pavement
- Lower fees, waive permits for energy efficiency improvements and use of solar energy
- Provide energy audits and assessments for improving energy efficiency
- Start cooperative purchasing programs for efficient lighting and equipment

Industrial Sector

- Establish fees, waive permits for energy efficiency improvements, use of solar energy and co-generation
- Provide energy audits and assessments for energy efficiency improvements
- Require industries to develop and implement energy conservation programs



Financing

- Create financing for energy efficiency improvements: revolving loan funds through bonds, energy taxes, etc.
- Fund transit use, bicycle or pedestrian improvements through parking fees

Green Power

- Aggregate commercial and residential purchases to buy renewable power
- Offer green power through your municipal utility
- Use franchise agreement to negotiate renewable energy

Land Use

- Promote high-density and in-fill development through zoning policies
- Give incentives and bonuses for in-fill and transit-oriented development
- Discourage sprawl through impact, facility, mitigation, and permit fees

Transportation Sector

- Encourage alternative modes:
  - improve facilities and infrastructure
  - implement free bikeshare program
  - establish shuttle service connecting neighborhoods to commuter lines
  - create Trip Reduction Ordinance
- Establish service center selling transit passes, coordinating ridesharing, etc.
- Change parking policies:
  - reduce parking fees for carpools or electric vehicles
  - reduce minimum parking space requirements for new construction

Waste Sector

- Implement, expand residential curbside recycling
- Expand commercial recycling collection
- Give incentives to reduce waste, such as pay-as-you-throw, special taxes, and tipping fees
- Collect and use landfill methane

Green Your Building Code

- Save energy and money
- Improve home comfort
- Increase worker productivity

Residential and Commercial Energy Conservation Ordinances (RECO and CECO)—Berkeley, CA

Results

- Over 20,000 residences (50% of Berkeley's housing stock) improved
- Over 130 commercial buildings (10% of City's total) improved
- Residential natural gas use has declined 18% per capita

Sample Home Improvements under Reco

- Insulate water heaters and hot water pipes
- Improve ceiling insulation
- Install fluorescent lighting and weather stripping
- Seal chimneys and furnace ducts against hot air leakage
- Replace showerheads with low-flow models that conserve hot water

About 35% of U.S. CO_2 emissions come from energy use in residential and commercial buildings. Conserving energy reduces these greenhouse gas emissions, creates big savings on utility bills, improves home comfort, and increases worker productivity. Local governments can make energy conservation happen through their building codes—requiring basic measures such as improved insulation and efficient lighting and appliances.

Ordinances for Efficiency. The City of Berkeley has demonstrated that energy savings can be achieved with off-the-shelf technologies and need not be confined to new buildings. In 1981, Berkeley passed its Residential Energy Conservation Ordinance (RECO) requiring energy efficiency upgrades in existing residences. The law includes a dollar cap on owners' obligations, but these typically inexpensive upgrades often pay for themselves rapidly in the form of lower energy bills. RECO's success led the City of Berkeley to extend its mandate to businesses, enacting its Commercial Energy Conservation Ordinance (CECO) in 1993.

Support from the Community. While new building requirements often face initial resistance, home- and business-owners also value the benefits that conservation measures create, such as improved real estate and lower utility bills. The City worked hard to bring the business community into the decision-making process before enacting CECO. As a result, RECO and CECO are turning emissions reduction into a painless and economically beneficial process for the City of Berkeley, its property owners and residents.

Key Contact

Neal DeSnoo
Energy Officer
City of Berkeley, CA
510.665.3486

Resources

Building Code Assistance Project offers free assistance to states and municipalities in adopting energy codes. 202.530.2200, *www.solstice.crest.org/efficiency/bcap*

Energy Consumption Reduction Incentives, U.S. HUD. Energy efficiency for public housing. 1.800.245.2691, *www.huduser.org*

Make Solar Power Affordable

- Create a market for renewable energy
- Reduce CO_2 emissions
- Promote local and independent sources of electricity

Sun Power Pioneers—Aspen, CO

Solar power harnesses sunlight to generate energy. By substituting the sun for fossil fuels, we can produce energy without producing greenhouse gas emissions.

In November 1998, the City of Aspen initiated the Sun Power Pioneers program to recruit local businesses and homeowners to install solar photovoltaic (PV) systems. The program, coordinated by Aspen's Community Office for Resource Efficiency (CORE), provides financial incentives for people to use solar power. Since February 1999, CORE has installed ten PV systems with a total capacity of 14 kilowatts (kW), with another 16-60 kW expected to be installed by the end of 2000.

Financial Incentives for Solar Power. Sun Power Pioneers' core strategy is to offer America's first "solar production incentives". Participants who install a grid-connected PV system on their home or business are paid for the electricity they generate at $0.25 per kilowatt hour. This is about 3.5 times the retail electricity rate in Colorado. Together with state rebates, CORE reduced the installation cost of a 2 kW system from about $15,000 to $10,250, a 32% price reduction.

The advantage of production incentives compared to traditional upfront subsidies is that those who install PV systems recover a part of their investment based on actual electricity production. By using incentives, a utility can pay back the homeowner or business over time, managing their cash flow and maximizing private investment in solar power.

Results in the First Year

- 10 solar PV systems installed
- 14 kW total installed capacity
- 42,000 lbs. CO_2 reduced

"People love solar and they are trying to figure out how they can afford it. Upfront cost is an obstacle but people want to buy solar power... The equipment for solar electric systems is also bomb proof, we've had no problems with over 20 installations."

Joanie Matranga
CORE Coordinator

Key Contact

Randy Udall
Director, CORE
970.544.9808

Resources

Visit the CORE web site at
www.altenergy.org/core

District Heating and Cooling

- Reduce cost of power production
- Cut SO_2, NO_x and CFC emissions
- Reduce maintenance costs

District Energy and District Cooling—Saint Paul, MN

Results

- Heats twice the building area with the same amount of fuel used in old steam system
- Offsetting CO2, SO2 and NOx by over 75%
- Reduces peak electricity demand
- Keeps energy dollars in the local economy

Green Power Through District Energy

DHC can also reduce greenhouse gas emissions through the use of green power. District Energy Saint Paul is currently developing a project to ensure that 75% of District Energy's annual energy usage will be fueled by urban waste wood, a renewable fuel source that is a serious metropolitan waste disposal problem. By using a community energy source, more energy dollars and jobs will remain in the local economy.

The average person living in the U.S. produces 5.37 tons of global warming pollution each year. Compare this to 1.99 tons for the average Western European. A reason for this disparity is that many European cities use district energy systems, which are far more efficient than the individual boilers and chillers used in the U.S. to heat and cool residential and commercial buildings. District heating began in Saint Paul in 1979. Today it serves over 440 downtown buildings and residential homes—over 23 million sq. ft. of building area—with over 99.99% reliability. The program began as a heating system only, but proved such a success that it led to the creation of a district cooling system that now serves about 50 downtown buildings.

District Heating. In Saint Paul's district heating system, hot water is produced by multiple boilers in a central plant and sent through underground pipes to individual buildings to meet space heating, domestic hot water, and industrial process needs. This eliminates over 100 smokestacks throughout the city. The system is also a co-generation facility, producing heat and electricity simultaneously. By fall 2002, the co-generation system will expand to 25 MW, doubling efficiency over conventional electric-only production.

District Cooling. In Saint Paul's district cooling system, chilled water is produced by chillers at off-peak hours and kept in a storage system for use during the day. This reduces the region's peak electricity demand and the need for more power plants.

Benefits of District Heating and Cooling (DHC). DHC systems offer savings in capital, operating, and maintenance expenses since there is no need to install, upgrade or maintain equipment at each building site. And unlike in-building boilers and chillers, which carry excess capacity to meet the occasional peak demand, district boilers and chillers are operated to achieve highest seasonal efficiency, thereby reducing peak demand and the need to build more power plants.

Key Contact

Sharon Lundberg
Development and Planning Analyst
District Energy Saint Paul
651.297.8955
www.districtenergy.com

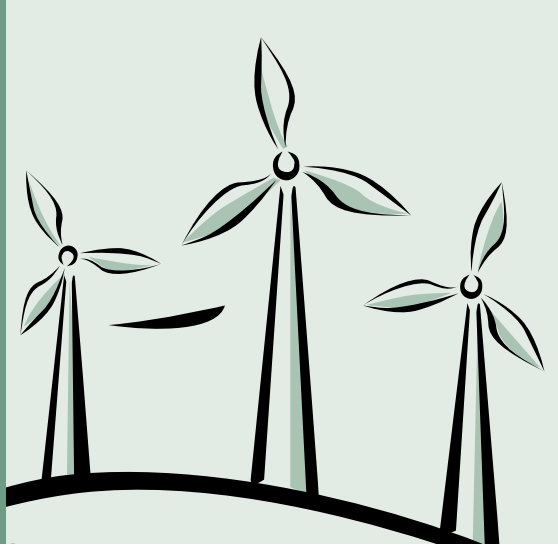
Resources

International District Energy Association
www.districtenergy.org

CADDET Energy Efficiency Centre
www.caddet-ee.org

Require Green Power from Utilities

- Increase use of renewable energy
- Reduce CO_2 emissions
- Improve air quality



Electric Utility Franchise—Ann Arbor, MI

At the heart of Ann Arbor's Energy Plan is the belief that there are serious problems with energy use in the U.S. and that it is important for the physical health and economic well-being of the community to prepare for the future by switching to clean, renewable energy sources.

Green Power for the Whole Community. In 1999, the City of Ann Arbor adopted its Electric Utility Franchise Ordinance to ensure that the electricity used by residents, businesses and institutions in the City included an increasing amount of renewable energy. The Franchise has a limited term of 5 years, and is revocable at the will of Council because of concerns with the experimental nature of utility restructuring and the desire to protect community interests.

The issuance of an Electric Utility Franchise is an important milestone for the City of Ann Arbor as it establishes local rules for future deregulated utility business within the city, and communicates important community priorities to potential electricity suppliers and state deregulation rule makers.

"Ann Arbor realizes that energy plays a significant role in the community, ... the franchise ensures that anyone selling energy in our community becomes a partner in furthering the goals of our Energy Plan, moving us towards more sustainable energy use."

David Konkle
Energy Coordinator

Requirements for electricity suppliers

- **Consumer "Right-to-know" Requirement**—information must be provided to all customers on contract terms, cost, generation sources and emissions characteristics of electricity being offered
- **Green Power Option**—customers must be offered the option to purchase a portion of their power as Green Power (non-nuclear, non fossil-fuel based)
- **Renewable Energy Portfolio Standard**—3% of the power sold to Ann Arbor customers must come from renewable energy sources, increasing to 10% in five years
- **Ann Arbor Assistance Fund**—electric suppliers must contribute to this Fund to help extremely low-income customers meet energy costs
- **Global Warming Limitation**—carbon dioxide content in electricity sold in Ann Arbor must not exceed 1,963 lbs./MWh, ensuring that the City's contribution to global warming will not increase with changing electricity supply

Key Contact

David Konkle
Energy Coordinator
City of Ann Arbor, MI
734.996.3150

Resources

Community Franchise Study, Public Technology Inc., Urban Consortium Energy Task Force, 1996

Charge for the Cost of Sprawl

- Reduce urban sprawl
- Lower cost of providing municipal services
- Improve local air quality

Distance Surcharge on Development Fees—Lancaster, CA

Results

- In the past five years, the population of Lancaster has grown by 16%, yet little growth has occurred outside the urban core

"It's more cost-effective now for developers to build on land near the urban core. We want to accommodate growth and development, but we don't want the cost of that growth transferred to people already living here."

David Ledbetter
USP coordinator

Motor vehicles are the largest and fastest growing source of greenhouse gas emissions in the U.S. Cars and light trucks burn about 150 billion gallons of fuel a year, producing 23% of our nation's greenhouse gas emissions. Gasoline use and GHG emissions are strongly correlated with both densities of population and jobs. These record levels of emissions are the result of our relentless pursuit of a sprawling, auto-oriented model of development that has placed trip origins and destinations further and further apart.

Using Economic Tools. Lancaster, CA uses impact fees to reduce urban sprawl by encouraging the location of new urban growth within or adjacent to the urban center. The impact fees reflect the additional cost to the City of expanding infrastructure to service each new development. In this manner, the fee structure provides a rational incentive for developers to build closer to the urban core, thus reducing sprawl.

Determining the Cost of Sprawl. Under its Urban Structure Program (USP), Lancaster imposes a distance surcharge on development fees. The surcharge is calculated based on the distance between the proposed project and existing urban center. The fees are assessed to new development based on expected fiscal impacts on the City, including infrastructure, utilities, sewer systems and other public services. The surcharge is levied for a period of 20 years, and the farther from town the project is, the higher the charge.

Key Contact

David Ledbetter
Coordinator, Urban Structure Program
City of Lancaster, CA
661.723.6100

Resources

A City's Sprawl Surcharge, Christopher Swope, Governing, September 1997

Impact Fees: Issues and Case Studies, International City/County Management Association (ICMA), MIS Report, vol. 23, no. 12, December 1991

Hop and Skip onto Public Transit

- Get people out of cars and aboard buses
- Reduce traffic congestion
- Reduce CO_2 and criteria air pollutant emissions

Go Boulder Shuttle Service—Boulder, CO

The City of Boulder hosts a very successful public transit system due to a combination of creativity and determination to get residents aboard buses. The system allows employees, students and visitors to shop, run errands, conveniently go to school, lunch, or meetings. Two components of its transit system are the HOP and SKIP shuttles—fleets of colorfully designed buses that provide high-frequency, inexpensive, and direct service by friendly drivers. Based on HOP's and SKIP's success, Boulder has plans to inaugurate its JUMP, LEAP, and BOUND services in 2000.

HOP. The HOP is a circulator shuttle that began in 1994 as a federal-funded ISTEA demonstration project. The fuel-efficient diesel HOP runs year-round, Mondays through Saturdays. A poll shows that 50% of HOP riders have cut down on drive-alone car travel, reducing over 4,000 tons of CO_2 each year.

SKIP. The HOP's success led to the start up of the SKIP shuttle. The SKIP fleet is made up of 15 buses and runs along Broadway—Boulder's main artery—7 days a week. SKIP was so successful that ridership more than doubled in the first year of operation. SKIP also boosts the local economy. Revenue in local shops and restaurants are estimated to have increased by $10 million annually.

Results

HOP

- 3,500 – 4,000 riders daily
- 50% of HOP riders have reduced car travel
- 4,000 tons of CO_2 reduced annually

SKIP

- 45% of SKIP riders drive less
- 3.1 million VMT cut annually
- 19,000 tons of CO_2 reduced annually
- $10 million in business and restaurant revenue generated annually

Factors contributing to HOP's and SKIP's success

• **Neighborhood ECO Pass**—This annual pass gives residents unlimited bus privileges on any HOP or SKIP bus, as well as access to the regional transit system that travels to the airport and local ski areas. The pass is offered at a low price, with potential savings of hundreds of dollars. One parent said that he loves the program because his children use the bus to get to their after-school engagements, thus eliminating a lot of his driving.

• **Business ECO Pass**—A business ECO pass is offered to local business employees at a discounted rate. The pass also includes a "Guaranteed Ride Home" providing passholders a free taxi ride home if they have an unplanned emergency. Approximately 700 Boulder County businesses are offering this pass to 20,000 area employees.

Key Contact

Tracy Winfree
Go Boulder Transportation Department
City of Boulder, CO
303.441.4164

Resources

Visit the Go Boulder website at
www.go.boulder.co.us

Pay People Not to Drive

- Trade parking for cash
- Encourage commuting using alternative modes
- Increase employee satisfaction

Parking Cash Out—Santa Monica, CA

Results

- 26 out of Santa Monica's 105 employers with 50 or more employees had implemented cash-out programs by February 1999
- Vehicle Miles Traveled (VMT) reduction of 544,000 miles per year
- CO2 emissions reduction of 196 tons per year

Lessons Learned

- Employees must be monitored to make sure that they are not parking on surrounding neighborhood streets after "cashing-out"
- Some negotiations with property managers who are unwilling to reduce the number of spaces being leased can be problematic

The City of Santa Monica enacted a Transportation Management Plan (TMP) Ordinance in 1991 to reduce traffic congestion and comply with federal and regional mandates to improve air quality. Under the TMP Ordinance, employers with 50 or more employees are required to file either an Employee Trip Reduction Plan or a Mobile Source Emission Reduction Credit Plan. Regardless of what type of plan they submit, employers who lease parking and offer it free to their employees must prepare a parking cash out plan as well.

Using Incentives. Parking cash out programs offer employees the option of receiving the equivalent monetary value of a parking space in place of the actual parking space. For example, if an employer currently pays $50 per month to lease each employee parking space, with a cash out program he/she would also offer $50 to employees who agree to give up their parking spaces. The average value of a cashed out parking space is $70 per month. Anyone eligible for free parking is offered a financial incentive to give up their parking privileges and instead commute by carpool, transit, or any other alternative to driving alone.

How it Works. Affected employers are sent a comprehensive packet of information that includes the text of the law, detailed information on parking cash out, and sample materials for presenting parking cash out to employees. City staff administer the parking cash out program for about 15 hours a month. Santa Monica finances expenditures for its TMP Ordinance through employer fees. As part of the ordinance, these fees cover implementation of parking cash out.

Key Contact

Karen Pickett
Transportation Management Coordinator
City of Santa Monica, CA
310.458.8295

Resources

Local Government Guide to Parking Cash Out, ICLEI—Cities for Climate Protection, Berkeley, CA, 1998

Parking Cash Out Incentive: Eight Case Studies, California Air Resources Board, 1998, at *http://arbis.arb.ca.gov/research/resnotes/notes/98-3.htm*

Finance Public Transit

- Guarantee funding for transit
- Mitigate downtown traffic congestion
- Reduce air pollution and CO_2 emissions

Transit Impact Development Fee—San Francisco, CA

Funding mechanisms have tilted the playing field toward private automobiles and away from public transit for at least fifty years. The result is that road and highway improvements have attained routine, almost automatic status, often with minimal public discussions and debate, while improvements for bus and rail lines, bicycles, and pedestrians have gone begging.

Leveling the Playing Field... between automobiles and alternative transit is crucial because strategies to lure drivers out of their vehicles will only work if sufficient resources are dedicated to transit systems and bicycle and pedestrian amenities to make them genuine alternatives. To compete effectively in the transportation marketplace, alternative transit modes need comprehensive route coverage, frequent service, and attractive and comfortable equipment. Local governments can help level the playing field by establishing new policies and priorities for transportation expenditures and projects in their communities.

Changing the Price Signal. Impact fees are commonly applied to developers for parks and schools, but transportation impact fees are rare. San Francisco adopted a development fee for all new downtown office construction to provide funding for transit services that such new employment centers would require.

San Francisco's Transit Impact Development Fee (TIDF) was implemented in 1981 to help mitigate the additional traffic and public transit demand created by workers in newly constructed downtown office buildings. The TIDF moneys have funded increases in transit services to meet peak demand generated by new downtown businesses. The fee of $5 per square foot is assessed on new office construction and conversions to commercial office space within a designated downtown district. Funds are paid directly to the Municipal Transit District, which operates San Francisco's light rail, cable car, and bus services.

Results

- Over the nineteen years the program has been in existence, $85 million in fees have been collected, contributing to 1.5% of the Municipal Transit District's annual operating costs

Lesson Learned

Although the TIDF has raised significant funds, a slowdown in new office construction in the late 1980s reduced the anticipated revenues. To account for such unforeseen circumstances, the impact fee could be applied to all downtown commercial development benefiting from transit, and not only to new offices.

Key Contact

Steve Nickerson
TIDF Coordinator, San Francisco Municipal Railway
City of San Francisco, CA
415.923.2108

Resources

Impact Fees: Issues and Case Studies, International City/County Management Association (ICMA), MIS Report, vol. 23, no. 12, December 1991

Share Vehicles

- Reduce dependence on automobiles
- Reduce parking problems
- Save money

CarSharing Portland—Portland, OR

CarSharing Portland (CSP), the first commercial car sharing organization in the United States, completed its second year of operation at the end of February 2000. At that time it had 220 active members sharing 13 vehicles located at 12 sites in the City of Portland, OR. CarSharing Portland offers drivers, who do not own a vehicle or who seek an alternative to owning a second vehicle, access to a car for their short term travel needs. Carsharers decrease unnecessary automobile travel and have convenient access to a car without the hassles of ownership.

CarSharing Portland provides short-term, hourly use of vehicles that are located in parking sites close to the member's household or place of work. Members are charged only for the time and mileage of each trip. Gasoline, maintenance, and insurance are included in the rates.

Results in the First Year

- CSP members estimated they saved an average of $154 per month in transportation costs
- 26% of CSP members sold their personal vehicle and 53% of members avoided a vehicle purchase as a result of joining CSP
- 75% of CSP members became more aware of their transportation costs
- CSP members increased transit ridership, bicycle use, and walking

Lessons Learned

- The biggest barrier to membership appeared to be the $500 security deposit. In January 2000, CSP lowered the deposit to $250 with support from Tri-Met, the local transit agency for transit pass holders
- Leasing off-street parking spaces was more work than anticipated, particularly in densely populated neighborhoods where parking is already at a premium

Key Contact

David Brook
President, CarSharing Portland, Inc.
503.872.9882
www.carsharing-pdx.com

Resources & Similar Projects

Mobility Car Sharing Switzerland and StattAuto in Germany influenced formation of CarSharing Portland.
www.mobility.ch

Seattle, WA Flexcar service
www.flexcar.com

Visit the Car Sharing network at
www.carsharing.net

Promote Bicycling

- Reduce traffic congestion
- Reduce CO_2 emissions and other air pollutants
- Create healthy means of transportation

Promoting Bicycling in the City's Transportation Strategic Plan—Seattle, WA

Bicycling is a critical component of Seattle's transportation system. It provides environmental and traffic-related benefits as it is non-polluting and helps reduce traffic congestion. Seattle has approximately 28 miles of bike trails, 14 miles of striped bike lanes, and about 90 miles of signed routes. Despite this extensive biking infrastructure, neighborhood groups and committed bicycling organizations still strongly advocated for more improvements. Their requests, along with City Planners' recommendations, were formulated into the City's Transportation Strategic Plan in October 1998.

A Comprehensive Bike Plan. The Plan was written to ensure that safe access and parking facilities would be provided for cyclists throughout the City, as well as to encourage more people to cycle. Highlights of the Plan include:

- completing and expanding the City's urban trails system to connect urban trails with regional trails
- incorporating pedestrian, bicycle, and transit improvements into capital improvement and major maintenance projects
- reviewing Code requirements in buildings to ensure adequate, safe, and convenient parking
- patching potholes, modifying traffic islands, and replacing drain gates to make streets more passable for bikers
- ensuring new federal transportation law gives fair funding treatment to bicycles by working with state and federal transportation agencies on TEA-21 funding program
- working with public transit agencies to ensure safe, convenient bike access to transit stations, as well as adequate biking facilities at the stations

Results*

Adding bicycle lanes to both sides of a street that linked to Seattle's downtown:

- Avoided 14,500 miles traveled by single occupant vehicle (SOV) commuters
- Reduced 7 tons CO2 and 200 lbs. CO

*These results are based on a survey of morning commute into downtown Seattle before and after the bike lanes were installed.

Key Contact

Peter Lagerwey
Bicycling and Pedestrian Coordinator
City of Seattle, WA
206.684.5108

Resources & Similar Projects

Copies of Seattle's plan are available from the Strategic Planning Office, 206.684.8080

Austin, TX Bicycle and Pedestrian Program
This plan provides excellent regulatory language for bicycle programs.
www.ci.austin.tx.us/bicycle

San Francisco, CA Bicycle Plan
www.igc.org/sfbc/sfbikeplan

Estimating the Effect of Bicycle Facilities on VMT and Emissions, Stuart Goldsmith, Seattle Engineering Dept., 1995

Finance Comprehensive Waste Reduction

- Reduce solid waste going to landfill
- Create jobs and generate revenue
- Reduce methane emissions

Surcharge on Landfilled Waste—Alameda County, CA

Results between 1990-1995

- Programs funded diverted 500,000 tons of solid waste
- Waste sent to landfill cut by 25%—despite population increase of 5%
- Reduced 380,000 tons CO_2
- Generated more than $50 million in revenues since 1991

At the heart of Alameda County's "Source Reduction and Recycling Initiative" is a surcharge imposed on each ton of waste landfilled in the county. The $6-per-ton surcharge is a dedicated revenue source for stable, long-term funding of waste reduction programs. This surcharge has generated more than $50 million in revenues since 1991.

Distribution of surcharge revenue follows a special formula—50% is directed to cities in the county for municipal programs and 50% is divided to support specific source reduction, recycling, market, and business development activities that reduce waste. Money collected from the surcharge is financing programs that have collectively reduced 500,000 tons of waste! These programs include:

- curbside recycling in every city in the county
- home composting education programs
- plant debris pick-up
- a "Stop Waste" business and industry program
- a revolving loan fund for businesses and other programs

Revolving Loan Fund Closes the 3R's Loop. The Initiative mandated that the County develop a waste reduction plan focusing on implementing the 3 R's of Reduce, Reuse, and Recycle. To ensure that waste reduction efforts did more than just collect materials, the Initiative emphasized "closing the loop" by building local markets for recycled materials. The Initiative established a $2 million revolving loan fund and a grant program for nonprofits and private businesses. Loans have helped a foundry reuse large quantities of sand, a business that makes landscaping materials from recycled plastics, and a business that recycles paper into tubes. Grant projects funded include a demonstration project that trains low-income youth to dismantle buildings in ways that preserve lumber, structural steel, cables, and other materials for reuse.

Key Contact

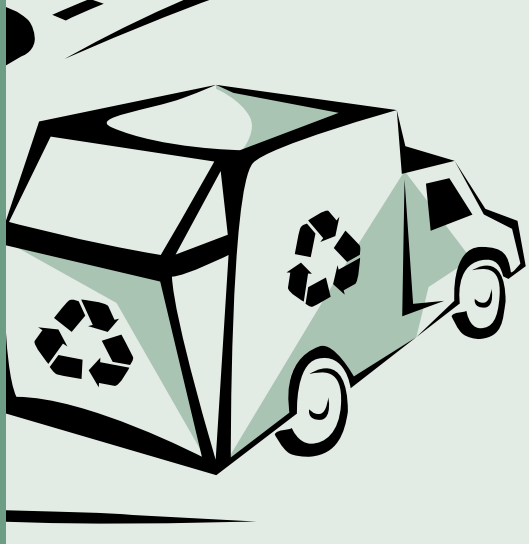
Bruce Goddard
Public Affairs Director
Alameda Co. Waste Management Authority
510.614.1699

Resources

Visit the Alameda County Waste Management Authority website at *www.stopwaste.org*

Reduce Commercial Waste

- Meet waste reduction goals
- Reduce methane emissions



Commercial Waste Reduction Programs—Bergen County, NJ and King County, WA

Most waste reduction programs emphasize residential recycling, but in many communities the commercial sector generates the larger portion of the waste stream. U.S. businesses discard 40% of the country's municipal solid waste and have a major impact on the remaining 60%, as they contribute to the waste consumers eventually throw away. Focusing on reducing commercial solid waste is a good way for local governments to effectively divert waste going to landfills and to meet waste reduction goals.

To Regulate... Bergen Co., NJ businesses divert over 60% of their solid waste from disposal each year. This success is in part due to strong local markets for recovered paper and in part due to a commercial recycling ordinance, requiring businesses to recycle high-grade and mixed paper, corrugated cardboard, and other materials, and to track and report the amounts of material recovered. To help businesses meet these goals, staff developed a waste audit manual for companies with more than 100 employees and provide on-site visits upon request.

Or Not to Regulate... King Co., WA runs Recycling, Packaging, and Construction Technical Assistance Programs and tailors waste reduction strategies to a company's size, type, and location. The programs encourage no-brainer strategies like 2-sided copying, electronic signatures, and reducing junk mail. An extensive online database directs businesses to where and how they can recycle just about any material. The Packaging Program provides industry-specific assistance in eliminating unnecessary retail and shipping packaging. Through Green Works, a voluntary waste reduction and recognition program, businesses commit to recycling 40% of their waste, practice at least 3 waste reduction strategies and use at least 3 recycled products. Distinguished members commit to more ambitious goals and promote waste prevention practices to employees, customers, and public.

Waste-Free Fridays

King Co. and businesses collaborate to reward waste prevention on Fridays, by focusing on a simple behavior to show residents how easy preventing waste can be. Waste-Free has resulted in significant media attention. Previous program focuses include:

- Local bagel shops offer free coffee to customers who use reusable mugs. Sale of mugs increased by 1200%
- Kinko's and Lazerquick offered discounts on 2-sided copies
- Ticketmaster gave holiday discounts to encourage giving tickets to events instead of presents wrapped in wasteful packaging

Key Contacts

Nina Herman Seiden, Recycling Program Manager, Bergen Co., NJ
201.641.2552 x5822

Lisa Sepanski, Green Works Business Recycling Program Manager, King Co., WA
206.296.4489

Resources & Similar Projects

Visit King Co.'s comprehensive and user-friendly website for its Solid Waste Business Programs at *http://dnr.metrokc.gov/swd/bizprog*

Portland, OR has an ordinance requiring businesses to recover 50% of their waste; staff help companies devise recycling programs to meet local recycling requirements.

Teach Climate Protection in Schools

- Introduce global warming to 6th-graders
- Have students give policy direction to city council
- Feature students and teachers in media

6th Grade Global Warming Curriculum—Chula Vista, CA

The Lesson Plan

- Day 1—Greenhouse Gases and Their Effects
- Day 2—The Threat of Global Warming
- Day 3—When Nature Loses its Cool
- Day 4—Light the Way
- Day 5—Global Warming and Chula Vista

Who is Using the Curriculum?

No. of schools	32
No. of teachers	78
No. of students	2,566

The City of Chula Vista includes a bilingual (English-Spanish) Global Warming Curriculum as an important part of its elementary school education program. Focusing public education on school children is critical, as these children will become tomorrow's decision-makers. They are the ones who will be most affected if global warming is not addressed in the immediate future.

Teaching the Students... The curriculum introduces school children to the issue of global warming and how it affects daily life in Chula Vista. Lessons help students identify how they and their families can alleviate global warming. Students' families are also invited to take a pledge to reduce carbon dioxide emissions in their own homes. Each lesson addresses a different topic, with Activity Sheets suggesting ways for students to keep their home and school cool. The final lesson focuses on how the City of Chula Vista is addressing climate change and gives students a chance to participate in a mock city council. Students are also encouraged to sign and send a petition against global warming to their Mayor.

To Teach the Community. To give the students an opportunity to apply their knowledge on global warming, Chula Vista's 6th-graders are encouraged to prepare exhibits for World Environment Day, focusing on global warming as a theme. Students present their exhibits as policy options to City Council—the best exhibits receive awards from the City, and both students and teachers appear on a San Diego television show.

Key Contact

Michael Meacham
Conservation Coordinator
City of Chula Vista, CA
619.691.5122

Resources

A copy of Chula Vista's curriculum in both English and Spanish is available for $10, including shipping. Contact Michael Meacham.

Cool Your Roofs and Pavements

- Reduce energy use and utility bills
- Reduce high urban summer temperatures
- Reduce smog

Heat Reduction Strategies—Salt Lake City and Highland, UT

The Urban Heat Island Effect. Large amounts of paved and dark colored surfaces in our built-up communities absorb rather than reflect the sun's heat, causing urban temperatures to be higher than in nearby rural areas. City temperatures in late summer afternoons are on average 5°F higher than in the adjacent countryside. This phenomenon is called the Urban Heat Island (UHI) Effect and it intensifies heatwaves, causes smog, raises energy costs, and adds to global warming pollution.

Local governments around the country are beginning to adopt UHI mitigation strategies to counter some of these effects, with Salt Lake City and nearby Highland, UT taking the lead in ensuring that new developments make use of "heat reduction" techniques, such as using reflective roofing, light-colored parking lots, and strategic tree planting.

Salt Lake City recently enacted an ordinance requiring that commercial property owners retrofitting or constructing new buildings in a revitalized downtown area use light colored roofs and parking lots and strategic tree planting in their plans. Salt Lake City has also amended the City's existing landscaping ordinance to ensure that trees are planted in the interior of commercial parking lots to shade pavements, vehicles, and pedestrians.

Highland, located south of Salt Lake City, encompasses all 3 aspects of heat abatement strategies in its Town Center's Master Plan. The progressive plan requires all parking lots to be paved in light-colored concrete, or possess 20% more trees to compensate. Roofing materials for low-sloped or flat roofs must have 75% reflectivity and high emissivity. Breaks, skylights, clear stories, and rooftop gardens are encouraged where appropriate. Specific guidelines for strategic tree planting specify species of trees, and where and how they should be planted for optimal shading. Highland found little objection from property owners and developers to the ordinance.

Hot Facts

- Dark roofs can be 90°F hotter than surrounding air on a hot day
- 1/6 of total electricity consumed in the U.S. is used for cooling ($40 billion/yr)
- Cooling roofs and increasing vegetation can reduce this cost 10-40%
- Home energy bills can be cut $100-$200/yr through tree shading and light roofing
- Air quality studies show that cooling urban areas can reduce smog formation by 20%

"Of all heat island reduction strategies, reflective roofing probably requires the least amount of adjustment for developers, as cost differences between light and dark colored roofs are negligible."

Soren Simonsen
Cooper/Roberts Architects

Key Contact

Camille Russell
Cool Communities Coordinator
Urban Heat Island Pilot Project
City of Salt Lake City, UT
801.538.8610

Resources

Soren Simonsen, AIA, APA
Principal Architect, Cooper/Roberts Architects, 801.355.5915

ICLEI's model Urban Heat Island ordinance will be available after June 2000.

acknowledgements

This Best Practices Guide was principally written and prepared by Prisna Nuengsigkapian. Contributing writers include Bill Drumheller, Chris Giovinazzo, Jim Liljenwall, Matt Nichols, Susan Ode, Allison Quaid, Nancy Skinner, Erin Williams, and Abby Young.

The authors would like to thank the following people for assistance in providing information and reviewing draft excerpts of this Guide:

David Brook, Portland, OR
Marcia Deegler, State of Massachusetts
Neal DeSnoo, Berkeley, CA
Bruce Goddard, Alameda County, CA
James Haugen, Saint Paul, MN
Vinnie Hunt, Tucson, AZ
Mark Kapner, Austin, TX
Deborah Kielian, Denver, CO
Michelle Knapik, Philadelphia, PA
David Konkle, Ann Arbor, MI
Peter Lagerwey, Seattle, WA
Kelly Lease, ILSR, Washington, DC
David Ledbetter, Lancaster, CA
Sharon Lundberg, Saint Paul, MN
Michael Meacham, Chula Vista, CA
George Moody, Overland Park, KS
Susan Munves, Santa Monica, CA
Tim Murphy, Toledo, OH
Curt Nichols, Portland, OR
Steve Nickerson, San Francisco, CA
Karen Pickett, Santa Monica, CA
Barney Popkin, San Francisco, CA
Jeanne A. Rogers, Los Angeles, CA
Camille Russell, Salt Lake City, UT
Nina Herman Seiden, Bergen County, NJ
Lisa Sepanski, King County, WA
Jim Twigg, Overland Park, KS
Randy Udall, Aspen, CO
Tracy Winfree, Boulder, CO

A special thanks to all cities and counties participating in the Cities for Climate Protection Campaign, whose hard work and dedication to climate protection provide the backbone of the U.S. CCP.

ICLEI's *"Best Practices for Climate Protection—A Local Government Guide"* was generously supported by the U.S. Environmental Protection Agency Office of State and Local Climate Change, Office of Solid Waste, and Landfill Methane Outreach Program.

Additional copies of this Guide may be purchased by contacting:
ICLEI U.S. Office
15 Shattuck Square, Suite 215
Berkeley, CA 94704
Phone: 510.540.8843
Fax: 510.540.4787
E-mail: iclei_usa@iclei.org

Graphic Design: Jennifer Crook, San Rafael, CA
Illustration: Paul Brown
Printed on 100% post-consumer waste, chlorine- and acid-free paper with soy-based inks.

ICLEI is an international association of local governments dedicated to the prevention and solution of local, regional, and global environmental problems through local action. There are over 300 ICLEI members comprising cities, towns, counties, and their associations from around the world.

ICLEI's **Cities for Climate Protection Campaign** (CCP) is a global effort to reduce the emissions of greenhouse gases from urban areas and to improve local air quality and urban livability. More than 350 local governments, including 70 U.S. cities and counties, are currently participating in the CCP. The Campaign operates training and technical assistance projects that focus on reducing emissions through energy efficiency, renewable energy, waste management, land use planning, and transportation improvements.

•I•C•L•E•I

International Council for
Local Environmental Initiatives

15 Shattuck Square, Suite 215

Berkeley, CA 94704

Phone: 510.540.8843

Fax: 510.540.4787

E-mail: iclei_usa@iclei.org