

New Energy for Cities

Energy-Saving & Job Creation
Policies for Local Governments

The Apollo Alliance
apolloalliance.org



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For decades, Americans have fled to the suburbs in search of clean air and open space. Ironically, some of the “greenest” places in America are its dense, vibrant cities. New York City, seen by many as an urban jungle, was recently called the “greenest city in the U.S.” because so many of its residents live in efficient multi-story buildings, and use public transit, bicycles, or their own feet to commute to work.¹ City residents also consume about half as much electricity as those who live in more spread-out suburban areas.

So cities can be models for *saving* energy. But just as important, cities can be models for creating good jobs *producing* energy, constructing high-performance buildings, and manufacturing clean-energy technologies. The manufacturing, construction, installation, and maintenance of renewable energy and energy efficiency systems will happen almost entirely in metropolitan areas. The physical infrastructure America needs to build these new technologies—factories, universities, and research parks—is in or near cities. The workers that provide a strong foundation for America’s clean energy future already live near this infrastructure. Best of all, because union densities are higher in cities, clean energy jobs in the city are far more likely to be good-paying union jobs than those created outside the city.

America’s towns and cities have the innovative and hard-working people, the entrepreneurial spirit, and the political independence to lead the way towards a future where clean energy and good jobs go hand in hand. And there has never been a better, or more urgent, time for cities to flex this power. By reducing energy imports and shifting to homegrown fuels, cities can reduce our \$200 billion trade deficit in oil and gas, creating millions of new jobs at home. They can stop funding politically unstable regimes. They can reduce the pollution that makes urban air unhealthy, contributes to asthma and other lung disease, and leads to global warming. Last but not least, by investing in energy-saving technology and cleaner fuels, cities across the country can create millions of good jobs in manufacturing, construction, and maintenance.

In this report, we lay out the **Apollo Alliance’s Four-Part Plan** for how cities can embrace a clean energy future:

- **Invest in Renewable Power**

Generate 25 percent of electricity from clean, renewable sources, through policies and programs that prioritize local production, workforce development, and good jobs.

- **Create High-Performance Buildings**

Revitalize the built environment by renovating public and private buildings, lowering energy consumption, moving toward renewable energy, and creating good jobs and job training for local residents.

- **Drive Toward Energy Independence**

Reduce oil consumption 25 percent by 2025 by promoting efficient technologies and clean, renewable fuel alternatives, through policies and programs that prioritize local production and good jobs.

- **Build High-Performance Cities**

Promote low-energy, high-performance cities and communities connected by regional transportation networks, through policies and programs that prioritize local hiring and good jobs.

Introduction

Many Apollo Alliance strategies—whether energy efficient measures or renewable energy systems—involve up-front capital costs that will result in reduced energy use and savings over time. For that reason, we propose a number of **financing options**, from bonding initiatives to low-interest loans, for cities to use to fund clean energy projects. Moreover, though the Apollo plan automatically creates millions of new jobs in manufacturing, installation, construction and services, cities must ensure that these jobs are high-skill jobs paying a family-supporting wage. To ensure that working Americans have a stake in the 21st century energy economy, we recommend that towns and cities include **job quality and job training standards** in all new energy policies.

With Apollo's Four Part Plan, we offer dozens of proven policies and practices for city officials to choose from. This report is not exhaustive—many towns and cities across the country have made real breakthroughs in energy policy that could not be included here for reasons of space. Instead, we aim to give a glimpse of what is possible when local governments decide to begin the journey toward a cleaner energy future. By starting on this journey, local governments not only help the environment and create good jobs for local residents; they also help themselves by cutting energy costs, relieving pressure on tight budgets, and demonstrating the essential value of public investment in new energy technologies.

Invest in Renewable Power

An increasing number of cities are turning toward, clean, efficient renewable energy to power their buildings and infrastructure. These renewable energy systems allow cities to become more independent from the grid and imported fossil fuels, boost the market for renewable technologies, move to more reliable and affordable resources, and display a visible public commitment to a sustainable energy future. In areas with high summer or winter electricity demands, using small-scale renewable energy systems can also protect residents and businesses from the costly effects of blackouts and brownouts.

Cities can and should leverage their control over public buildings, as well as their ability to provide financing and incentives to renewable energy developers, to bring high-quality jobs in the renewable energy industry to their communities. The vast majority of these jobs are in manufacturing, so cities should concentrate on attracting PV cell, wind turbine, and geothermal heat pump manufacturers, as well as the component part manufacturers that support all these industries. Cities can also ensure that projects on public buildings, or that involve public subsidy, include job quality and training standards.

What Cities are Doing Now

At the end of 2005, the Mayor of **Albuquerque, New Mexico** signed a comprehensive renewable energy measure into law. The resolution calls on the city to adopt policies to establish and implement a City Renewable Energy Initiative, including the following elements:

- The City Office of Economic Development and the Energy Conservation Council will develop a program to provide tax incentives and tax credits, up to \$1 million, for solar energy manufacturers or solar research and development companies located within the city.
- The City Department of Municipal Development and the Energy Conservation Council will begin a process to retrofit all existing city-owned buildings and facilities with renewable energy systems, solar energy in particular. The goal of this program is to secure 15 percent of the power for all city-owned facilities from renewable sources within fifteen years. All new facilities over 100,000 square feet will be equipped with renewable energy systems capable of generating at least 25 percent of the facility's estimated energy requirements.
- The City Finance Department will develop a rebate program to encourage the use of renewable energy by city residents, and will amend the Industrial Revenue Bond application process to add points for the creating, production, or use of renewable energy in industrial facilities.
- The city will propose new procurement standards that require agencies to purchase products that reduce toxic chemicals and greenhouse gas emissions, maximize water and energy efficiency, favor renewable energy sources, favor recyclable or compostable materials, and consider life-cycle economics of each product including its manufacture, transportation, use, and disposal.

The resolution also calls on the city to lobby the state legislature to pass net-metering legislation, which will enable the city to sell excess renewable energy from its upgraded city buildings back to the utility grid.

For more information

- Gene Bustamante, Energy Specialist
- Energy Conservation Council
- 505.768.5374
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Policy link

- Resolution R-05-329: www.cabq.gov/energy/documents/Resolution329.doc

Invest in Renewable Power

1 Solar Energy

One of the most visible commitments a city can make to renewable energy is to install solar electric panels (called photovoltaic or “PV” panels) on public buildings, and to encourage their use on private residences and businesses throughout the city. Installing PV panels on city buildings provides extra security from blackouts during periods of strong electricity demand, such as hot summer days. Because the sun is most intense during mid-day, PV panels provide electricity when demand is highest. Solar power can also be used to heat a building’s water supply. Constructing or retrofitting a building to harness solar energy for lighting or hot water is easy, cost effective, and environmentally friendly. Solar energy is also one of the most environmentally friendly ways to generate electricity and heat. According to the EPA, a typical 6 kW solar system will save 32 pounds of nitrogen oxides, 44 pounds of sulfur dioxide and 17,199 pounds of carbon dioxide each year—equivalent to the carbon dioxide that would be absorbed by planting two acres of trees. In addition to installing these systems on their own buildings, many cities encourage their use on private buildings through tax credits and other incentives.

What Cities are Doing Now

Chicago, Illinois is part of a public-private partnership focused on advancing the development of the solar energy industry in the Chicago metropolitan area. The Chicago Solar Partnership, which includes the solar design and installation company Spire Solar Chicago and the Pipe Fitters Local 597, provides outreach and education on solar energy and technical assistance to end users. Founded in 2000, the partnership has already worked to install nearly 2 MW of solar power in Chicago, mostly on buildings within city limits.

This is a model project because it focuses not only on energy production but also on jobs. In 2003, Chicago gave interest-free financing to the solar manufacturer Solargenix Energy in order for the company to relocate their facility to the old stockyard district in downtown Chicago. The facility now employs 15 people full-time, and manufactures 30–40 solar collectors per day.

For more information

- Kathy Quasey, Program Developer
- Chicago Solar Partnership
- 312.744.0470
- kathy.quasey@cityofchicago.org
- <http://www.chicagosolarpartnership.com/>

Santa Clara, California rents private citizens and businesses solar equipment to heat their swimming pools, process water, and domestic hot water. The solar components (solar collectors, controls and storage tanks) are owned and maintained by the city; renters pay an initial installation fee and a monthly utility fee that varies according to the size of the installation. Renters keep any money saved in energy bills.

For more information

- Santa Clara City Solar Utility
- 408.615.2200
- www.ci.santa-clara.ca.us/pub_utility/ws_water_heating.html

Oroville, California has proved itself to be a forerunner in the use of solar energy and development. During the California energy crisis, when electricity rates jumped nearly 41 percent, the Oroville Sewage Commission was struggling to keep up with rising costs and increase self-reliance and sustainability. Within six months, using a combination of general fund revenues and redevelopment agency bonds, Oroville installed a 520 kW solar system in its Wastewater Treatment Plant that cut power costs by about 80 percent.

The system results in annual savings of \$58,000 for the sewage treatment plant in demand rates alone and is projected to pay for itself in only nine years. The wastewater treatment plant has notable environmental benefits as well, reducing emissions by 1.4 million pounds of carbon dioxide, 5,800 pounds of sulfur dioxide and 2,800 pounds of nitrogen oxide.

For more information

- Ray Sousa, Superintendent
- Sewerage Commission-Oroville Region
- 530.534.0353
- scor-ray@oroville.net

1 Solar Energy cont...

Honolulu, Hawaii, in partnership with the Hawaiian Electric Company, offers low-interest loans (0 percent or 2 percent) to qualified homeowners who want to install Solar Water Heating Systems on their homes. Landlords of affordable or low-income properties are also eligible for the program. Honolulu estimates that home owners who install the solar water heating systems can expect to use 90 percent less fossil fuel-based electricity than they would without the systems. To further promote the purchase of solar hot water systems, the Hawaiian Electric Company provides \$750 rebates off the purchase prices of qualified systems.

For more information

- Dan Tully
- Rehabilitation Loan Branch
- 808.527.5917
- www.co.honolulu.hi.us/dcs/solarloan.pdf
- Ron Richmond, Analyst
- Hawaiian Electric Utility Co.
- 808.543.4784
- ron.richmond@heco.com

Tucson, Arizona developed an innovative third-party financing mechanism for installing solar hot water heaters on city swimming pools. Called an Independent Energy Producer (IEP) contract, the city's RFP calls for private companies to bid on designing, building, operating, maintaining, and financing Solar Pool Heaters and Domestic Hot Water Heating systems for five existing public pools. Under the IEP contract, the private company builds and maintains the system with no up-front cost to the city. Once the system is in place, Tucson will pay the difference between its original energy costs and its new costs to the contractor, thus paying off the cost of construction. Once the system is paid off, Tucson will own the system and benefit from future reduced energy bills.

For more information

- Vinnie Hunt, Energy Manager
- 520.791.4724
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Policy link

- In conjunction with the United States Department of Energy, the city of Tucson constructed an informative website that explains how to structure third-party financing contracts for renewable energy systems, available at: <http://energy.sandia.gov/index.htm>.

Oakland, California developed one of the state's largest municipal solar projects with a combined 1.1 MW serving Oakland's Ice Center and Municipal Service Center. The two systems cover 85,000 square feet of roof space. At the Ice Center, the 372 kW PV system generates 31 percent of the electricity used to make the ice for two skating rinks in downtown Oakland, and the 760 kW system at the Municipal Service Center in the Coliseum Business Park covers 82 percent of that building's energy needs. The systems are estimated to eliminate 385 tons of carbon dioxide emissions per year and save \$244,000 in energy costs each year.

The PV systems were coupled with energy efficiency measures as a way to further decrease the facilities' utility costs and to increase the percentage of electricity generated by solar.

For more information

- Scott Wentworth, Energy Engineer
- City of Oakland Public Works Agency
- 510.615.5421
- swentworth@oaklandnet.com

Invest in Renewable Power

2 Geothermal Energy

Geothermal energy systems use the Earth's natural sub-surface heat to produce electricity, or to directly heat water or air. To date, there are already 2,800 MW of geothermal capacity deployed in the United States, enough to power 1.7 million households. While the geothermal resources needed to directly produce electricity are geographically limited, every region of the U.S. has some available geothermal energy.

Geothermal heat pumps, the most common building-scale geothermal technology, are generally used to take pressure off buildings' HVAC (Heating, Ventilation and Air Conditioning) systems. The heat pump transfers heat from the soil to the house in winter and from the house to the soil in summer, using an environmentally friendly heat exchange fluid similar to antifreeze. This process is very efficient, reducing electricity consumption by 30 to 60 percent. Operating and maintenance costs are quite low. Because of the easy application and quick payback periods of geothermal systems, several cities are also providing incentives for integrating them into new construction projects.

What Cities and Counties are Doing Now

North Bonneville, Washington replaced the 20 year-old electric resistance duct system in its City Hall with a ground-coupled geothermal heat pump system that provides both heating and cooling for the 4,600 square foot building. The system circulates heating and cooling fluid at a rate of 9 to 15 gallons/minute through deeply drilled pipes. Regardless of outside temperature, the fluid always returns to surface at the average ground temperature of 54 degrees Fahrenheit, dramatically decreasing the pressure on the building's existing heating and cooling system. The total cost of the system was \$16,761. Staff estimate that the system decreases electricity use by 34,000 kWh/yr, saving \$1,500 per year compared to the old electric resistance system.

For more information

- Ray Hays, Public Works Manager
- 509.427.8182

The Stark Metropolitan Housing Authority in **Canton, Ohio** was faced with the challenge of how to improve living conditions at Metropolitan Towers, a 150-unit, eight-story building comprised mostly of studio apartments. Built in 1972, the building was in decline and the vacancy rate was rising dramatically. The Housing Authority decided to install a geothermal energy heat pump system to save energy dollars while still providing a comfortable environment. At the same time, the building received an entire energy retrofit, including new roofing, energy-efficient windows, compact fluorescent lighting, low-flow toilets, a centralized domestic water heating system and additional insulation. SMHA saves \$29,000 annually as result of these improvements, and releases 40,000 tons less carbon dioxide into the air than it did before the retrofit.

For more information

- Steve Ewing, Energy & Compliance Supervisor
- Stark Metropolitan Housing Authority
- 330.454.8051
- ewingnets@aol.com or info@starkmha.org

Thief River Falls, Minnesota provides low-interest loans and incentives to customers installing or retrofitting ground source heat pumps. The current program offers up to \$8,000 at five percent interest and a rebate of \$2,000 to offset the cost of installing the system's external loop field. The town has also installed heat pumps in various public buildings including the elementary school, utility shop building and City Hall.

For more information

- Arlo Rude, Utilities Director
- 218.681.5816
- citytrf@citytrf.net

The **Big Island of Hawaii** uses geothermal energy to meet approximately 20% of its total energy needs. Puna Geothermal Venture delivers an average of 25–30 megawatts of energy on a continuous basis. Located about 21 miles south of the city of Hilo, the facility is located on about 25 acres along the Lower East Rift Zone of the Kilauea Volcano. From 1997–2001, this project displaced the need to burn 475,000 barrels of fuel oil on average each year. With the State of Hawaii's 90% dependence on foreign oil, a diversified renewable portfolio is especially important.

For more information

- Barry Mizuno
- Puna Geothermal Ventures
- 808.965.6233
- www.punageothermalventure.com

3 Wind Energy

Of all renewable energy technologies, the one with greatest potential to replace a large number of conventional power plants is wind power. Wind power is cost-competitive with coal-fired plants, produces no emissions, and offers price stability to customers and utilities.

Municipal utilities located in areas with strong wind resources can easily begin increasing the supply of wind power available to utility customers. In cities with private utilities, local government can commit to purchasing a set amount of wind power each year and can encourage residents to do so as well. In addition, cities can promote small-scale wind turbines by adopting wind-friendly zoning and planning regulations.

What Cities are Doing Now

Bowling Green, Ohio led the development of Ohio's first utility-scale wind farm, a groundbreaking project that is spurring interest in wind power development throughout the state. In the late nineties, Bowling Green's Utilities Department established a green power pricing program that set aside money to pay for future wind and solar development, including further testing of the region's wind resources. When wind resources proved to be sufficient, Bowling Green led a coalition of ten municipal utilities which issued bonds to finance the wind farm's construction. The wind farm consists of four 1.8 MW towers, and produces enough electricity to power a village of 1,560 homes.

For more information

- Daryl Stockburger, Director of Utilities
- City of Bowling Green
- 419.354.6246
- daryl.stockburger@bgohio.org

In 2005, **Boulder, Colorado** partnered with Western Resource Advocates and several renewable energy suppliers in a commitment to increase city residents' renewable energy purchases. Boulder was already one of the nation's leading supporters of wind power, with more than 5,000 households and 300 commercial and industrial customers purchasing wind power for their home or business. However, the city sought to deepen its commitment by setting a goal to sign up 500 additional wind power customers from the residential and commercial sectors.

In just two months, the Boulder Wind Challenge succeeded in signing up 1,150 new wind power subscribers, more than twice the initial goal. New subscribers purchased almost sixteen million kWh of renewable energy, which has the same environmental benefits as taking 2,440 cars off the road for a year and saving 92 acres of trees from deforestation. Due in part to the challenge's success, the Environmental Protection Agency (EPA) has designated Boulder a Green Power Community, the first place in Colorado to receive this designation.

For more information

- Carolyn Weinreich
- Office of Environmental Affairs
- 303.441.1914
- weinreichc@ci.boulder.co.us

Mason City, Iowa recently passed City Ordinance 06-03, which allows the construction of small windmills on private property in commercial, industrial and residential zones. Mason City's ordinance requires permits for windmills and sets limits on where they can be built. Residential windmills cannot exceed 100 feet in height and can be put only in backyards. The lot has to be big enough so that if the windmill topples it doesn't cross property lines.

Mason City's ordinance was spurred by a local resident who wanted to construct a windmill to power his local business. Because of the area's strong wind resources, this resident estimates he can save enough on electric bills to pay for a \$40,000 system in eight to ten years.

For more information

- Mayor Roger Bang
- 641.421.3600
- mayor@masoncity.net

Invest in Renewable Power

4 Biomass Energy

The most widely available form of renewable energy is bioenergy—the energy derived from plants and plant-derived materials, including trees, plants, wood wastes, animal wastes, and some industrial wastes. This diverse set of raw materials can be converted into equally diverse forms of energy—electricity, liquid and gaseous fuels, and a variety of products. By better utilizing urban and exurban biomass resources, cities can move toward a homegrown source for fuel and power, while also decreasing waste and preserving open farmland.

Landfill Gas (LFG)

Nearly every city in America has a nearby landfill. An increasing number of cities are harnessing the methane gas these landfills produce, and using it to generate power. As of December 2005, there are approximately 395 operational LFG energy projects in the United States and nearly 600 landfills that are good candidates for projects. About two-thirds of these projects generate electricity, and the other third pipe the gas to local businesses that use it for heating purposes.

For more information on landfill gas technology and to find out whether there is a good landfill candidate near your city, visit the EPA's Landfill Gas Outreach Program at: www.epa.gov/landfill/overview.htm.

What Cities are Doing Now

Denton, Texas partnered with California-based Biodiesel Industries, Inc. to harness the landfill gas from a city-managed dump, and use it to power a biodiesel production facility. The new biodiesel facility has an initial production capacity of three million gallons of pure biodiesel per year.

For more information

- Vance Kemler, Director of Solid Waste
- 940.349.8444
- vance.kemler@cityofdenton.com

Burbank, California recently installed a ten-microturbine gas system at its landfill to divert approximately 160 cubic feet per minute of gas from the landfill flare and generate up to 300 kilowatts of green power. The system has just one moving part, uses no oil, lubricants or coolants, and is designed to operate at full load capacity 24 hours a day, 365 days a year.

For more information

- Bonnie Teaford, Public Works and Capital Project Manager
- 818.238.3915
- bteaford@ci.burbank.ca.us

4 Biomass Energy cont...

Municipal Biomass Collection

Tree trimmings and fallen branches produce a large amount of wood waste in American cities each year. Most cities already collect this material and use it as wood chips for landscaping in city parks. However, some cities are beginning to view this wood waste as a valuable renewable energy source and are finding higher-value uses for it.

What Cities are Doing Now

Saint Paul, Minnesota, through its partner District Energy St. Paul, contracts with a local company to manage a wood recycling facility that turns waste wood into biomass fuel. The local company sorts through the wood and diverts 300,000 tons of wood waste to a nearby co-generation facility, where it is used to produce electricity for local residents. The initiative saves the city money by keeping wood wastes out of the landfills and helps the environment by providing a renewable fuel for the power plant.

For more information

- Rick Person, Project Manager
- Department of Public Works
- 651.266.6122
- rick.person@ci.stpaul.mn.us
- District Energy St. Paul, Inc.
- 651.297.8955
- <http://www.districtenergy.com/>

The Phillips Community Energy Cooperative (PCEC) in **Minneapolis, Minnesota** is working to transform a waste transfer station in South Minneapolis into a model of environmentally friendly, community-based energy. The Phillips Biomass Community Energy Project will use urban tree trimmings and agricultural residues to fuel a combined heat and power (CHP) plant. Slated to come online in 2007, the project is expected to generate 20 MW of electricity that will be sold to the electric grid, while the heat will be used for homes in the community surrounding the project. When running at full capacity, the project will meet the energy needs of approximately 20,000 households, creating greenhouse gas reductions equivalent to taking 40,000 cars off the road. In addition, the project will create approximately 20 good-paying permanent jobs and another 200 jobs during construction of the project.

For more information

- Carl Nelson
- The Green Institute/PCEC
- 612.278.7117
- cnelson@greeninstitute.org
- <http://renewableenergy.greeninstitute.org/>

Invest in Renewable Power

4 Biomass Energy cont...

Methane Digesters

In agricultural areas, many cities struggle with preserving their water quality as runoff from manure-fertilized fields enters streams and rivers. Figuring out environmentally responsible ways to control the manure produced by farm animals is a top priority for rural communities. But human and animal waste disposal is also an issue for urban communities; recently some cities have become concerned by the large amounts of pet waste disposed of in city landfills.

In the face of these challenges, cities are developing new ways to promote the use of methane digesters. Methane digesters are large holding tanks that use bacteria to break down human, animal, and other organic wastes. As these wastes decompose, they produce methane gas, which is then captured by the digester and burned in a boiler to produce renewable power. Methane digesters are an exciting solution to both the need for renewable energy, and the problems of waste disposal and odor control.

What Cities and Counties are Doing Now

San Francisco, California is piloting a program to turn dog waste into energy. In partnership with a private company that collects the city's trash, San Francisco is distributing special biodegradable bags in one of the city's main dog parks. These biodegradable bags allow trash collectors to deposit them, and their contents, directly into a methane digester. The methane can be piped directly to a gas stove, heater, turbine or anything else powered by natural gas. According to the city, animal feces make up nearly four percent of residential waste, or 6,500 tons a year—nearly as much as disposable diapers.

For more information

- San Francisco Recreation and Park Department
- 415.831.2700

Cayuga County in central **New York State** is planning an innovative partnership with ECO Technology Solutions to develop and construct a community anaerobic digester to process organic waste from local dairies and food processors; the resulting biogas will generate electricity for various county buildings. The Cayuga County Soil and Water Conservation District is leading the project as a way to tackle both energy and water quality problems in the community.

Cayuga County will collect manure from several small to mid-size farmers who cannot support a manure treatment facility on their own. The collected manure will be used to power a digester, which the county expects to generate 625 kW of electricity. In return, local farmers will receive a truckload of liquid fertilizer to use in place of land-spread manure. This liquid fertilizer is a byproduct of the digester process and is lower in phosphorus, preserving water quality in the county. This innovative renewable energy project is expected to be operational by spring 2007.

For more information

- Jim Hotaling, Executive Director
- Cayuga County Soil and Water Conservation District
- 315.252.4171
- jim-hotaling@ny.nacdnet.org
- Bill Cetti
- ECO Technology Solutions
- 703.669.3221

4 Biomass Energy cont...

Combined Heat and Power (CHP)/Cogeneration

Cities can significantly improve the efficiency of their electrical and heating systems through the use of combined heat and power (CHP, a.k.a. cogeneration) technology. CHP systems use the same fuel combustion to produce both thermal energy for heating (usually in the form of steam) and electricity (often via a steam-driven turbine). These efficient systems recover heat that normally would be wasted in an electric plant, and save the fuel that would otherwise be used to produce heat or steam in a separate unit. CHP fuel savings are typically 35 percent compared to standard power stations and heat-only boilers, and CHP plants are 70–90 percent efficient,² compared to efficiencies of 33–60 percent for standard power plants.³ This increase in efficiency and decrease in fuel use translates into cost savings and emissions reductions.

What Cities are Doing Now

Honolulu, Hawaii has installed a 200 kW cogeneration unit on its City Hall, Honolulu Hale. The cogeneration unit, along with lighting and HVAC upgrades, was installed with assistance from the United States Department of Energy's Rebuild America program. As a result of the retrofit, energy use decreased 39 percent, saving more than \$125,000 per year.

For more information

- Allyn Lee, Project Manager
- City and County of Honolulu
- 808.523.4106
- alee2@co.honolulu.hi.us

Philadelphia, Pennsylvania recently negotiated a long-term service agreement with Trigen–Philadelphia, a local power company, to secure the development of a combined heat and power facility in the city. Trigen bought an aging steam heating district system in southwest Philadelphia in 1996 that provided 70 percent of Philadelphia's downtown buildings and institutional facilities with steam for heating, cooling, domestic hot water production, and cooking through 33 miles of underground steam pipe. This large central steam system provided heat to a number of downtown buildings through oil-fired boilers, but did not produce electricity for the grid.

Pursuant to its agreement with the city, Trigen retrofitted the old steam system with a 118 MW gas turbine that funnels its exhaust gases through a heat recovery system to generate high pressure steam. This high pressure steam then goes through a 52 MW condensing steam turbine to generate electricity; the system also provides low-pressure steam for continued use in the district heating system. The new system has a fuel conversion efficiency of 70 percent, more than twice the national average for utility generation. The project also uses 13 percent less fuel than separate heat and power, conserving 1.6 billion standard cubic feet of natural gas and 61,000 barrels of oil a year, and reducing carbon dioxide emissions by 110,000 tons—the equivalent of planting 30,000 acres of forest or displacing the annual greenhouse gas emissions from 10,000 households.

For more information

- Kevin Brown, Vice President and General Manager
- Trigen–Philadelphia
- 215.875.6900 ext. 128

Invest in Renewable Power

4 Biomass Energy cont...

Co-firing

Another way of using biomass to reduce our dependence on foreign fuels is to burn it in conjunction with traditional fossil fuels at existing power plants. While most of the nation's older power plants cannot easily burn 100 percent biomass, many can burn a combination of biomass and fossil fuels. Using biomass as a secondary and supplemental fuel source in power plants reduces carbon dioxide and nitrogen oxide emissions. This approach provides a low-cost renewable energy option that utilizes local biomass resources and existing energy infrastructure.

As with all biomass-based strategies, it is important that cities considering co-firing projects prioritize responsible land-use policies, such as burning agricultural and wood waste (corn stover, crop wastes, wood pellets, etc.) rather than allocating vast tracts of open land to biomass fuel crops. It is also important to avoid co-firing any waste products that may create toxic air pollution.

What Cities are Doing Now

The cities of **Hibbing** and **Virginia, Minnesota** are working with state and federal officials to repower two older coal-fired power plants with locally-sourced biomass material. The Laurentian Energy Authority, a joint venture of the two cities' public utilities, seeks to capitalize on the market created by Minnesota's renewable energy requirements. The repowered plants will produce 35 MW of renewable power from biomass, preserve 70 existing jobs and create 60–100 new jobs in the communities. The project will use biomass grown and harvested by local loggers, stored at a separate wood yard between the two cities. The cities of Hibbing and Virginia supported the project with \$84 million in revenue bonds that will be repaid by monies generated by the project.

For more information

- Terry Leoni, General Manager
- Virginia Department of Public Utilities
- 218.748.7564
- leonit@vpuc.com
- Jim Kochevar, General Manager
- Hibbing Department of Public Utilities
- 216.262.7728
- jimk@hpuc.com

Create High-Performance Buildings

Residential and commercial buildings account for over a third of U.S. energy use and carbon emissions.⁴ As construction methods and insulation technology have improved, so too has our ability to build structures that use less energy, contribute fewer pollutants to our environment, and improve comfort and productivity.

City governments, which directly control thousands of public buildings and have influence over millions of private residential and commercial buildings, are in a key position to bring innovative design and efficient construction principles into everyday use around the country. Cities also have the leverage to ensure that the many construction, operating and maintenance jobs that are associated with green building and energy efficiency retrofits go to high-skilled, well-paid workers in their communities.

1 Updating Building Codes

Millions of new buildings are constructed in American cities each year. Updating building codes so that new construction is more efficient can save residents and businesses countless dollars in energy costs. For example, the US Department of Energy (DOE) estimates that incorporating efficient design into new buildings can cut heating and cooling costs by close to 50 percent.⁵ Updating building codes can also create new jobs in construction, upgrading and installation—jobs that are often unionized and pay a family-supporting wage.⁶

In order to ensure that all new buildings constructed in a city meet a minimum level of energy efficiency, city or county governments can adopt legislation updating existing residential and commercial building codes to the most recent International Energy Conservation Codes (IECC) standards. Updating building codes to the most recent IECC standards, and requiring that any future IECC updates be adopted within one year of publication, ensures that new construction uses less energy, contributes fewer pollutants to our environment, and improves comfort and productivity.

What Cities and Counties are Doing Now

Seattle, Washington adopted its first energy code in 1980, and most recently adopted the Washington State Energy Code with amendments in 2004. This code is considered by building professionals across the country to be one of the better examples of a state and local energy code, because it sets mandatory standards for most houses and businesses at levels that are more stringent even than the IECC recommends.

For more information

- Seattle Department of Planning and Development
- 206.684.8600

Policy link

- Seattle Energy Code: <http://www.seattle.gov/dpd/energy/default.htm>

The city of **Aspen** and **Pitkin County, Colorado** have adopted, with local amendments, the 2003 International Codes. This includes all building, mechanical, plumbing, fuel gas, fire, property maintenance, and existing building codes. Pitkin County has also taken a larger look at the issue of residential energy efficiency and included extra requirements for especially high-energy homes. For example, homes with certain high energy-use features (for instance, the home is more than 5,000 square feet, or includes a hot tub or heated pool) must install energy-efficient appliances or renewable energy equipment to offset that extra energy consumption, or must contribute to a fund that invests in such features elsewhere in the community.

For more information

- City of Aspen Community Development
- 970.920.5090
- http://www.aspenpitkin.com/depts/41/bldg_efficient.cfm

Policy links

- IECC codes: www.iccsafe.org/
- DOE Building Energy Codes Program (financial and technical assistance): www.energycodes.gov/implement/doe_assist.stm
- Building Codes Assistance Project: www.bcap-energy.org/

Create High-Performance Buildings

1 Updating Building Codes cont...

On March 30, 2005 the **Phoenix, Arizona** City Council adopted a new “Phoenix Building Construction Code,” which includes the 2003 International Energy Conservation Code (IECC) and its 2004 Supplement. The new code also provides minimum health and safety standards for the construction of buildings in Phoenix.

For more information

- Anne Sobczak
- City of Phoenix Development Services
- 602.534.3878
- anne.sobczak@phoenix.gov
- www.phoenix.gov/DEVSERV/index.html

2 Energy Audits & Retrofits

Cities directly control many buildings and must pay utility bills for all of them. Incorporating efficiency measures in city buildings presents a great opportunity for local governments to save money and help the environment. Simple retrofits to windows and electrical, lighting, or heating systems can yield large energy cost savings. Such retrofits not only save the government money, they also lead to more comfortable work environments, which have been linked to higher worker and student productivity.

City governments should conduct energy audits on all city-controlled buildings to inventory current energy use and identify the most cost-saving and efficient retrofits available for these buildings. These audits and retrofits generally bring in significant savings, thus paying for themselves quickly. As an example, federal government efficiency standards instituted in the mid-1980s reduced building energy consumption by 23 percent over a 15-year period, saving taxpayers an estimated \$1.4 billion per year.⁷

Cities can also encourage building owners in the private sector to conduct similar audits and retrofits, for instance by requiring that buildings include efficiency upgrades prior to building sale.

What Cities are Doing Now

Springfield, Massachusetts is preparing to embark on an estimated \$20 million energy improvement program for public buildings through projects ranging from new boilers to attic insulation. The city will hire a firm to conduct an energy audit of 90 buildings, including City Hall, Symphony Hall, schools, libraries, fire stations, the police station and park buildings.

For more information

- Patrick J. Sullivan, Director
- Parks, Buildings & Recreation Management
- 413.787.6440
- <http://www.springfieldcityhall.com/Park/>

The city of **Chula Vista, California** developed a City Energy Plan to protect city agencies, residents and businesses from the high cost and unreliable supply of energy. City offices implemented network software to put computer monitors in sleep mode when unattended for more than ten minutes—a move that saves approximately \$13,000 per year. The city also replaced appliances with higher efficiency models. In addition, the city enacted an extensive public awareness and education campaign that provided residents with a free home energy audit, energy efficiency compact fluorescent lights (CFLs) and information on energy rebates. The city’s efforts resulted in a 15 percent reduction in citywide energy use in 2001. The city’s free energy audit program was also a success: 1,500 homes were audited.

For more information

- Office of the City Manager
- Recycling and Conservation Division
- 619.691.5122
- SaveEnergy@ci.chula-vista.ca.us

2 Energy Audits & Retrofits cont...

Berkeley, California was the first city in the nation to require that anyone selling a residential building install conservation measures at time of sale, or whenever improvements valued at more than \$50,000 are made to residential property. Cost and energy-saving measures required by Berkeley's Residential Energy Conservation Ordinance (RECO) include insulating ceilings, water heaters, and hot water pipes; sealing furnace ducts; installing fluorescent lighting and weather stripping; blocking hot-air flow out of chimneys; and conserving hot water by installing low-flow shower heads. To date, approximately 12,000 residences (30 percent of the housing stock) have been certified as meeting RECO requirements. Berkeley also requires conservation measures in commercial buildings that are sold or substantially renovated.

For more information

- Phil Kamlarz, City Manager
- 510.981.7100

Policy link

- Berkeley Residential Energy Conservation Ordinance: http://www.ci.berkeley.ca.us/bmc/Berkeley_Municipal_Code/Title_19/16/index.html
- Commercial Buildings—Energy Conservation Measures: http://www.ci.berkeley.ca.us/bmc/Berkeley_Municipal_Code/Title_19/72/index.html

Ashland, Oregon offers extensive assistance to homeowners who audit and retrofit their homes, including home energy analysis, duct sealing and weatherization rebates, zero interest loans, and rebates for energy efficient appliances.

For more information

- Cathy Cartmill
- City of Ashland Conservation Division
- 541.552.2063
- cartmilc@ashland.or.us
- <http://www.ashland.or.us/Page.asp?NavID=1366>

Create High-Performance Buildings

3 Green Building Standards for Public Buildings

While energy audits and building codes can help existing buildings become more efficient, implementing green building standards for city-funded projects ensures that future buildings will be efficient and environmentally friendly. The United States Green Building Council (USGBC) sets national standards for green buildings through its Leadership in Energy and Environmental Design (LEED) rating system. The most commonly accepted and widely used green building standard, LEED awards credits to structures in six categories: sustainable siting, water efficiency, energy and atmosphere, materials and resources, indoor environmental air quality, and innovation in design. Each structure achieves a LEED certification level ('certified,' 'silver,' 'gold,' or 'platinum') based on how many points it scores in each of these categories.

Using this comprehensive approach, green building creates environmentally sustainable, healthy, and economical buildings. Green building techniques can reduce building energy costs by 20–50 percent⁸ and water usage by at least 50 percent outdoors and 30 percent indoors, resulting in substantial savings for cities and taxpayers.⁹ At the same time, studies show that the additional cost of building green is only \$4 per square foot, or about two percent of building costs, yet net savings over a twenty year period are between \$48.87 and \$67.31 per square foot.¹⁰

Green building also requires a skilled labor force, and union apprenticeship and journeyman programs are well-suited to train workers in the modern construction techniques associated with green building projects. Adopting green building standards that are coupled with public-private partnerships with labor can lead to the creation of high-quality jobs for Trade unionists such as Sheetmetal Workers, Electrical Workers, Glaziers, and Plumbers and Pipefitters.¹¹

What Cities are Doing Now

In 2005, with the help of the **New York City Apollo Alliance**, **New York City** passed Local Law 86, which will require many of the City's new municipal buildings, additions, and renovations to achieve rigorous standards of sustainability. The law applies to the construction and rehabilitation of municipal buildings (including schools, hospitals and city agency offices) and other construction projects that receive \$10 million or more of city funds. It will affect approximately \$12 billion in construction over the City's ten-year capital plan, including \$5 billion in school construction. By significantly improving the performance of major new and renovated public capital construction projects, the bill ensures that energy costs for these projects will decrease at least 20–25 percent and the waste and pollution generated by buildings will be reduced.

For more information

- Joanne Derwin, Program Director
- NYC Apollo Alliance
- Joanne_derwin@qc.edu

Seattle, Washington requires all city-funded projects over 5,000 square feet to meet LEED Silver standards. To do so, the city operates an interdepartmental group of city employees, the Green Building Team, which acts as resident experts on elements of green building.

Seattle's City Hall and Justice Center are two new high-rise downtown buildings that were built to LEED Silver standards under Project Labor Agreements with the Seattle/King County Building and Construction Trades Council. The Justice Center was equipped with special mechanical features including variable flow chillers in its cooling system, energy-conserving devices built into the HVAC systems, and airflow handling on a floor-by-floor basis. The Justice Center's design elements cut energy costs by 32 percent. This was a complex Ironworker/Glazier installation.

For more information

- Richard Gelb
- Office of Sustainability and Environment
- richard.gelb@seattle.gov
- http://www.ci.seattle.wa.us/dpd/Sustainable_Building/index.asp

In 2003 **Dallas, Texas** implemented a Green Building Program to incorporate sustainable building design and construction practices into new municipal building projects. All projects over 10,000 square feet will be LEED Silver Certified. In addition, LEED certified projects will receive expedited building permit and code review. Currently approximately 38 projects throughout the Dallas/Fort Worth area are seeking LEED Certification. Thirteen are city of Dallas Projects.

For more information

- Jill Jordan
- Assistant City Manager
- 214.670.5299

Create High-Performance Buildings

3 Green Building Standards for Public Buildings cont...

In 2000, the **Chicago, Illinois** Department of Environment initiated the City Hall Rooftop Garden Pilot Project as part of the EPA's Urban Heat Island Initiative. During the garden's first summer, the roof surface temperature dropped by 70 degrees, and the surrounding air temperature dropped by 15 degrees. Since the City Hall project, about 150 public and private buildings have installed green roofs, including a downtown McDonald's restaurant and an Apple computer store. These projects were spurred in part by the city's green building policies, which apply to new public buildings and publicly-subsidized private developments and require that a certain percentage of roof space be allocated to green roofs. Chicago is supplementing this program by awarding twenty \$5,000 grants to help the owners of small commercial properties and residential buildings install green roofs.

For more information

- Sadhu Johnston, Commissioner
- City of Chicago Department of Environment
- 312.744.7606
- sjohnston@cityofchicago.org

Policy link

- Chicago's Green Building Agenda: <http://tinyurl.com/rr4zq>

4 Green Building Incentives for the Private Sector

All the same arguments for greening public buildings apply to private buildings—and there are far, far more private buildings than city-owned structures. Cities may not have direct power over private residential, commercial, or industrial properties, but they do have some ability to regulate these structures and to provide incentives for building owners to embrace green building standards. Examples of government-backed green building incentives include property tax incentives, grant programs and rebates, modifications to the city's zoning regulations and/or expedited permit review for qualified green building projects.

What Cities and Counties are Doing Now

The **Alameda County, California** StopWaste.Org agency (comprised of the Alameda County Waste Management Authority and the Alameda County Source Reduction and Recycling Board) provides green building technical assistance and support to the **West Oakland Apollo Alliance**, which also includes community members and business and labor representatives. One of the Alliance's most innovative projects is a green building demonstration project known as Red Star Homes, which is built on the site of the old Red Star Yeast factory—formerly the source of major toxic air contamination in the community. West Oakland Apollo is working to get the proposed 119-unit condominium development built to green building design and construction standards, and to ensure the project employs both union contractors and local low-income residents who have completed a community-based green construction skills training program.

For more information

- Carla Din, Western Regional Field Director
- Apollo Alliance
- din@apolloalliance.org

Arlington County, Virginia established a green building incentive program in 1999 to encourage the construction of more environmentally friendly office buildings. The program rewards developers and companies that construct LEED certified buildings with permission to add extra density or height to their buildings, beyond what is typically allowed under the county's zoning standards.

For more information

- Randy Bartlett, Director of Infrastructure and Operations
- 703.228.3711
- rbartlett@arlingtonva.us
- www.co.arlington.va.us

Create High-Performance Buildings

4 Green Building Incentives for the Private Sector cont...

Aspen, Colorado instituted an Efficient Building Program in 2002, designed to educate the building trades and general public about ways to use resources more efficiently. All building permit applications submitted for review must include a completed EB Checklist. If the project includes a remodel and/or demolition/deconstruction, then a Deconstruction Plan form must be filled out in addition to the Checklist. Applicants must accumulate a number of points for each project, based on their inclusion of certain efficiency measures, such as reduced construction waste, use of recycled and renewable resources, energy efficiency, indoor air quality, renewable energy use, and water conservation, as well as efficient building techniques. The city requires different numbers of points depending on the size and type of the project.

For more information

- City of Aspen Community Development
- 970.920.5090
- http://www.aspenpitkin.com/depts/41/bldg_efficient.cfm

Santa Monica, California's Green Building Program was designed to increase sustainability in all new buildings without putting excessive burdens on builders or developers. Many of the measures have some associated initial cost, though others can actually reduce first costs and operating costs, and all of them increase the overall value of the building. Most of the city's green building requirements apply to commercial construction, major renovation projects, and multi-family residential projects with more than three units. The Green Building Program provides specific "green" design and construction strategies in the following topic areas: Building Site and Form, Landscaping, Transportation, Building Envelope and Space Planning, Building Materials, Water Systems, Electrical Systems, HVAC Systems, Control Systems, Construction Management, and Commissioning.

For more information

- Greg Reitz
- Environmental Programs Division
- 310.458.2213
- greg.reitz@smgov.net
- <http://smgreen.org/>

Oakland, California offers inspections and auditing services and financial support to the Alameda County Green Business Program to promote Green Business certification in Oakland. So far, over 180 Alameda County businesses and public agencies have formed partnerships with the San Francisco Bay Area Green Business Program.

For more information

- Pam Evans, County Coordinator
- 510.567.6770
- pamela.evans@acgov.org
- <http://www.greenbiz.ca.gov/AboutUsAC.html>

5 Green and Efficient Purchasing

In addition to owning and regulating large amounts of real estate, buildings, and transportation infrastructure, city governments also purchase an immense number of products—everything from paper to paint, motor oil to HVAC systems. These goods all require energy and resources to produce, package, transport, use, and/or dispose. Through their daily purchases, local governments exert substantial power over the market. Choosing products with minimal life-cycle impacts can save energy, reduce emissions, increase the market for high performance products and even save money. (Note: while environmentally preferable purchasing policies can encompass a wide range of products—from recycled paper to less toxic cleaning materials to locally grown food—we focus here on purchasing decisions most closely related to energy.)

One simple adjustment to a city's purchasing policy is to require Energy Star-rated appliances and office equipment. These products, which carry the EPA's visible Energy Star label, use 25–50 percent less energy without compromising quality or performance.¹² According to one study, replacing 100 inefficient computers with EnergyStar computers and monitors can save \$10,000 in energy costs in five years.¹³

What Cities are Doing Now

In 2004, the **Dallas, Texas** City Council enacted an Environmental Procurement Policy directing the City, along with all its consultants and contractors, to purchase and use recycled materials and other environmentally preferred products whenever feasible. The policy also directed city agencies to implement a training program for all staff making purchasing decisions.

For more information

- Leah Register
- Business Development & Procurement Services
- 214.670.3329

In June 2001, **Chicago, Illinois** partnered with the Chicago Transit Authority, the Park District, and 48 surrounding municipalities to purchase green power, beginning with three percent in the first year and climbing to 20 percent over the next five years. The awarded bidder was Commonwealth Edison with the Environmental Resource Trust (ERT); the utility will sell 'green tickets' that are certified by ERT. Profits from the initial sale will be used to form a trust fund that will finance the development of more renewables capacity. Phase 1 of the project cut greenhouse gas emissions by 45,530 tons and saved 116,644,000 kWh.

For more information

- Steven Walter, Assistant Commissioner
- Energy Management and Policy
- 312.744.4106
- swalter@cityofchicago.org

Mayor Will Wynn and the **Austin, Texas** City Council have adopted a resolution that commits Austin to developing a greener transportation system. Part of this plan is to replace existing city fleet vehicles with plug-in hybrids. Mayor Wynn has been a leader in advocating that cities across the United States purchase Plug-In Hybrid Vehicles (PHVs) for city fleets. PHVs have drive trains similar to traditional hybrid vehicles, utilizing power from two sources: a battery pack and internal combustion engine. The primary difference between PHVs and hybrids currently available to consumers is that the battery pack in a PHV is expanded and modified to allow the input of electrical energy from standard 110/220V outlets. The larger battery capacity allows PHVs to be driven 20–80 miles on electrical charge alone, and then seamlessly transition to traditional hybrid operation when the charge in the battery is depleted. Thus, PHVs allow for clean, emission-free driving on short trips, but have a travel range equal to any traditional car (300–400 mi).

In 2005, Mayor Wynn introduced a resolution to the Austin City Council to adopt an incentive-based PHEV program. The hybrids will be powered using wind turbines owned by West Texas Wind. Mayor Wynn is pushing for the 50 largest cities in the United States to join Austin in this initiative, which includes a commitment to purchase the vehicles when they become available.

For more information

- Lisa Braithwaite
- Austin Energy
- 512.322.6511
- pluginaustin@austinenergy.com

Create High-Performance Buildings

6 Building Operations & Maintenance

Constructing buildings in a sustainable manner is just one component to building a high-performance city. Building operations—how a building is run day-to-day—have a large impact on energy use and the environment. Heating and cooling systems, for example, are critical to the comfort of occupants, but operating these systems inefficiently can cause massive energy waste and high energy costs—as an example, the University of Buffalo estimates that each degree of overheating or overcooling costs them \$100,000 per year in unnecessary energy use.¹⁴

Cities should pursue implementation of the United States Green Building Council's existing building standard, or LEED-EB, for all city-owned and leased buildings. These sustainable building-operations guidelines capture both a building's physical systems (equipment, design, land use, etc.) and the ways the building is occupied and operated by its managers (waste management, temperature monitoring, commuting programs, etc.).

Information Technology

One of the major hidden costs of new technology is increased energy consumption. A typical personal computer left in continuous operation costs about \$120 per year. However, when systems power down during evening and weekend hours, the operating cost drops to \$20 annually.¹⁵ Cities can do several things to reduce the energy footprint of their technology. They can purchase efficient, Energy Star computers, printers, and other equipment; they can make sure that all units power down, or "sleep," when not in use; and they can encourage energy-saving behavior in computer users.

Conservation

One of the most cost-effective ways cities can reduce energy use is through basic conservation and efficiency, such as turning off the lights when no one is in an office or building. Many cities have come up with public awareness programs to encourage efficient behavior among employees. Cities can also establish friendly competitions between departments or buildings to encourage energy conservation. Another inventive for conservation is to allow some or all of the energy savings to be paid back to the participating departments.

What Cities are Doing Now

In 2001, **San Diego, California** launched a year-round Energy Conservation Action Plan, in which the city asked its employees to reduce the number of appliances they use, and turn off or unplug appliances and other electronic devices when not in use. In fiscal year 2001–02, the City's overall energy costs were reduced by 13 percent. The city also had VendingMiser devices installed on 183 Pepsi vending machines at various city facilities. This energy efficient measure is projected to provide the city with approximately \$55,000 annually in energy savings.

For more information

- Energy Conservation & Management Division
- Environmental Services Department
- 858.694.7000
- energy@sandiego.gov
- <http://genesis.sannet.gov/infospc/templates/esd/index.jsp>

When **Atlanta, Georgia** first examined its energy use in 2002, it found a few surprises. For example, City Hall used as much energy in the middle of the night as it did in the middle of the afternoon. After the audit, the city created an Energy Stars Employee Conservation Program to encourage employees to turn off lights, computers and other equipment when not in use. The program relies on energy coordinators in each city department, who take responsibility for conservation in that department. Thanks to the hard work and conservation efforts of these employee energy coordinators, the city exceeded savings expectations by \$22,000 in 2003.

For more information

- Ben Taube, Environmental Manager
- 404.330.6752
- btaube@atlantaga.gov

7 Innovative Approaches to Utilities

One key way that cities can promote energy efficiency and renewable energy is by developing innovative approaches to utility regulation and management. Cities that actually own their own utilities are clearly in the best position to affect utility practices; however, even cities that contract with utilities may be able to pass local policy that makes renewable energy and efficiency projects easier within city limits.

Many of the policies listed here make sense only for cities that own and control their own utilities. Creating a municipal utility allows cities to directly manage electricity and natural gas services, to offer programs that encourage energy efficiency and renewable energy production and use, and to set aside a portion of ratepayer funds for innovative energy projects.

An example of a municipal utility that is working hard to provide efficient, clean energy solutions to city residents is Austin Energy in Austin, Texas. Austin Energy is a department of the city of Austin. The utility's projects range from emissions reduction programs at its power plants to solar rebate, solar loan, and green building incentive programs for its customers. Austin Energy also tries to reduce its employee's commute times—and their impact on the environment—by allowing workers flexible work schedules, such as allowing them to work from home one day a week, or to compress their work weeks to four 10-hour days. The utility also leads the way in its support of plug-in hybrid vehicles.¹⁶

Demand Side Management

Demand Side Management (DSM) is the umbrella term for any utility-administered program aimed at reducing or modifying consumer energy demand. DSM programs take many forms. For instance, a utility might provide cash rebates for consumers who buy energy efficient appliances or efficient lighting, or might perform free energy audits to highlight improvement opportunities in residential and commercial properties. Additionally, some utilities save energy and improve reliability by shifting the inessential portion of a customer's power consumption from peak hours to off peak hours. This has a smoothing effect on the peaks and troughs in daily energy patterns, and offsets the need for inefficient "peaker" plants which run only during periods of extremely high demand.

What Utilities are Doing Now

Each winter, **Pacific Gas and Electric** offers a 20 percent rebate to customers who reduce their cumulative natural gas consumption by ten percent between January and March. A report in March 20, 2006 showed that 53 percent of PG&E customers reduced their gas use during January and February in order to take advantage of the rebate. PG&E's rebate program encourages consumers to develop an instinct for conservation through simple habits such as lowering the thermostat, and reduces utility costs and emissions at the same time.

For more information

- PG&E Energy Savings Programs
- 800.933.9555
- http://www.pge.com/news/latest_topics/wintersavings/

To manage intense cooling demand during the desert summer, **Nevada Power** offers a portfolio of end use efficiency programs. For instance, the utility provides cash rebates for Energy Star appliances and efficient (SEER 13) air conditioners. It also hosts the Cool Credit Program, in which the utility installs a receiver on residential air conditioner units that allows them to be turned off during summer peaks. This option makes sense for the many consumers who are not home during prime cooling hours. In return, customers receive up to \$60 per month in credit toward their utility bills.

For more information

- Nevada Power
- Conservation Programs
- 702.367.5000
- <http://www.nevadapower.com/conservation/residential/programs/>

Create High-Performance Buildings

7 Innovative Approaches to Utilities cont...

Green Pricing Programs

“Green pricing” programs allow utility customers to voluntarily choose renewable energy as part of their energy mix. Customers opting into these programs pay a premium rate on their utility bills to account for the higher cost of renewable energy. This price premium is based on the difference between fossil fuel costs and renewable energy costs. In some regions the rate disparity has declined significantly due to rising fossil fuel prices. At this time more than 600 utilities offer green pricing programs. Since 2004, customer participation in green pricing programs nationwide has grown by 20 percent to 430,000 customers. In the same time period utilities have increased their green energy production by 36 percent to 2.7 billion kWh.

Green pricing programs give consumers the ability to directly buy renewable energy without producing the energy themselves. These programs also allow utilities to invest in clean energy at times when it is not as cost-effective as fossil fuel energy. In the long term, green pricing helps utilities build crucial renewable energy infrastructure.

What Utilities are Doing Now

Measured by renewable energy output, **Austin Energy**—a municipal utility run by **Austin, Texas**—has the nation’s leading green pricing program, generating over 435 million kWh of renewable energy annually. The GreenChoice program applies varying renewable energy rates based on the year a customer subscribes. For customers who subscribed in 2000, the rate is \$.017 per kilowatt hour; for customers who subscribed in 2005, the rate is \$.035 per kilowatt hour. This approach is unusual because it provides long term fixed rates for renewable energy while the utility’s fossil fuel rates remain variable. This has become a strategic advantage to manufacturers. In 2001, IBM subscribed to the program and anticipated spending \$30,000 on the rate premium. Later that year, however, natural gas prices spiked. As a result, IBM saved \$20,000. Since then, fossil prices have continued to rise. In 2004, IBM anticipated that GreenChoice would save the company \$60,000.¹⁷

For more information

- Ed Clark
- Austin Energy Green Choice Program
- 512.322.6514
- green.choice@austinenergy.com
- <http://www.austinenergy.com/>

Measured by customer enrollment, **Xcel Energy** offers the most successful green pricing program, with 49,354 participants. High enrollment can be partially attributed to the favorable green pricing rate, as Xcel offers the nation’s cheapest renewable energy program. As of December 2005, renewable energy was actually 67 cents/kWh below fossil fuel rates. The program is also impressive in its generation rates, with over 147 million kWh of annual production.

For more information

- Xcel Energy
- Product Sales and Information
- 800.824.1688
- <http://www.xcelenergy.com/>

7 Innovative Approaches to Utilities cont...

Public Benefits Funds

Better known as a state strategy, Public Benefits Funds (PBF) can also be implemented by cities through their municipal utilities. PBFs are funds generated by levying a small surcharge on consumer electricity usage. The surcharge is typically based on energy consumption, though some states (e.g. Pennsylvania) charge a flat monthly fee. The money collected in these funds typically supports a range of energy programs, including weatherization efforts, rebate programs, renewable energy research and development, retrofit incentive programs and energy bill assistance for low-income consumers. Studies indicate PBFs have positive effects on a state's economy—each \$1 spent from the fund leverages roughly \$3 in related business and consumer investment.¹⁸

What Utilities are Doing Now

In **Sacramento, California** the **Sacramento Municipal Utility District** (SMUD) offers customers the opportunity to add a monthly tax-deductible contribution to their utility bills each month. The contributions are aggregated into a fund used to provide low-income customers with financial assistance in paying overdue bills. Since 1996, SMUD customers contributed nearly \$500,000 to the fund.

SMUD also puts aside a percent of ratepayer dollars for its Energy Assistance Program Rate (EAPR), which allows low-income customers to save up to 30 percent on their bills, and for its Residential Weatherization Program, which allows qualified low-income customers to have their homes weatherized at no cost.

For more information

- Sacramento Municipal Utility District
- 888.742.7683
- <http://www.smud.org/>

Create High-Performance Buildings

7 Innovative Approaches to Utilities cont...

Decoupling

Under current pricing schemes, utility companies generate more profit when they sell more units of energy, and thus they have little incentive to promote efficiency or the use of renewable energy systems. Realizing this, several states have severed the link between utility profits and sales quantity. This regulatory approach, called “decoupling,” indexes retail rates to sales volume. If volume drops because of energy conservation, rates are adjusted upwards. If volume increases and that increase was preventable, rates are adjusted downward. By holding utility profits constant irrespective of sales, volume becomes irrelevant. While this approach neutralizes the disincentive towards energy efficiency, it does not by itself create an incentive; for this reason, municipally-owned utilities should consider adopting positive energy efficiency measures (such as DSM programs) as well.

What Cities are Doing Now

In **Alachua County, Florida**, the Alachua County Environmental Protection Advisory Committee (EPAC) recently presented a report to the Alachua County Commission, recommending among other things that the city of **Gainesville, Florida** decouple its consumer-owned utility profits from sales to maximize energy efficiency. EPAC recommended the following steps be taken to accomplish decoupling at the local level:

Here are the essential steps [when implementing decoupling policy at the local level]:

1. At regular intervals, the city decides how much income it should receive from the utility. The utility also decides how much income it needs to cover its fixed costs, including additions to reserves for emergencies, loan repayments, and contributions to various utility contingency funds it maintains.
2. Rates are set in the usual way, using forecast of sales of different kinds together with the total revenue needs decided in step 1 above to determine the total income and the per unit rates to be charged to each kind of customer.
3. Periodically, income from sales is reviewed to see whether the utility has collected more than it needs, or less. If it has collected more, rates are reduced and the extra income is returned to ratepayers. If it has collected less than it needs, rates are increased slightly to make up the needed difference. This process is called a “true-up”, and it is routinely performed by electric cooperatives, which collect no profits from their ratepayers.

The report also notes that extra income could be used in whole or in part to fund energy efficiency and DSM programs.

For more information

- Rob Brinkman, Chair
- EPAC
- 352.264.6800

Policy link

- SEPAC’s report, “Review of the Gainesville Regional Utilities’ Proposal for a New Coal-Fired Power Plant,” is available at: http://environment.alachua-county.org/Natural_Resources/EPAC/EPAC_Review_of_Coal_Power_Plant.pdf

7 Innovative Approaches to Utilities cont...

What States are Doing Now

In 1998, the **Oregon Public Utilities Commission** adopted a performance-based ratemaking tariff for PacifiCorp's electricity distribution functions. The plan applies a "revenue cap" to each customer class (industrial, commercial, residential, etc.). If actual sales revenues exceed the predetermined cap in any of the classes, the extra is set aside in a balancing account. The following year, the balancing account funds are given back to the utility if sales were lower than projected, and given back to customers if utility sales were higher than projected. In this way, the utility's revenues are disconnected from the amount of electricity it distributes, eliminating any reason to discourage customer generation or energy conservation efforts. Recently, the Oregon PUC adopted a similar structure to decouple revenues from volumetric sales for Northwest Natural Gas Company.

For more information

- Administrative Hearings Division
- Oregon Public Utility Commission
- 503.378.6678
- <http://www.oregon.gov/PUC/>

Policy links

- OR PUC order 98-191 (PacifiCorp):
<http://apps.puc.state.or.us/orders/1998ords/98-191.pdf>
- OR PUC order 02-634 (Northwest Natural Gas):
<http://apps.puc.state.or.us/orders/2002ords/02-634.pdf>

Create High-Performance Buildings

7 Innovative Approaches to Utilities cont...

RPS/Feed-In Tariffs

Renewable Portfolio Standards and Feed-In Tariffs are tools cities can use to require utilities operating within city limits to increase their use of renewable energy sources over time, thus creating a stable market for renewable energy in the region. In addition to reducing pollution, these laws decrease cities' dependence on potentially unreliable sources of fossil fuels and can create good jobs in renewable energy system installation, operating and maintenance, and in laying utility lines to these new systems.

An RPS works by setting the minimum amount of renewable energy that must be developed by retail electricity vendors each year. The amount increases over time, steadily decreasing a state's dependence on traditional energy sources while simultaneously building a renewable energy infrastructure. This system creates a guaranteed market for renewable energy in a particular location.

Feed-In Tariffs, used more commonly in Europe, are small tariffs levied on conventional power producers in a particular region. Funds from these tariffs are then used to pay above-market rates to renewable power producers in the same region. This system provides a stable price point for renewable energy generators, and lowers their risk to entering the energy market.

What Cities are Doing Now (RPS)

In 2004, with 78 percent of the vote, the citizens of **Columbia, Missouri** overwhelmingly approved a "Renewable Energy Standard" for the city. The measure requires that the city's municipal utility obtain two percent of its power from renewable energy sources, like wind and solar power, by 2007; the percent ramps up to 15 percent by 2022.

For more information

- Columbia Water & Light Authority
- 573.874.7325

Policy link

- Columbia's Renewable Energy Standard, Columbia Code of Ordinances §27-106: <http://www.dsireusa.org/documents/Incentives/M004R.htm>.

What Cities are Doing Now (Feed-In Tariff)

Feed-In Tariffs have not yet found favor in the United States; however, several foreign countries have embraced this policy as the best way to bring smaller renewable energy producers into the energy market. Most recently, the **Province of Ontario, Canada** announced in March 2006 that the provincial government will set a standard price for renewable power from small producers: 11 cents CDN/kWh for wind, biomass, and small hydro power, and 42 cents CDN/kWh for solar. The program is expected to enable farmers, communities, and native Canadian populations to produce renewable energy competitively with large developers, and to dramatically expand renewable energy production throughout the province.

For more information

- Ontario Sustainable Energy Association
- 416.977.4441
- info@ontario-sea.org
- <http://www.ontario-sea.org/ARTs/ARTsList.html>

7 Innovative Approaches to Utilities cont...

Community Choice Aggregation

Community Choice Aggregation (CCA) allows city governments—or regional entities acting for multiple cities—to act on behalf of all their residents in negotiations with utilities. In this system, cities act as intermediaries between ratepayers and utilities, negotiating bulk power rates for entire cities instead of allowing utilities to set individual rates for each customer. To improve participation rates, some areas have experimented with opt-out CCA programs, giving customers a window of opportunity to decide not to enroll in the program; if no action is taken, they are automatically enrolled. Opt-out programs have the advantage of lower marketing costs.

CCA vests the community with greater control over generating resources. The city, acting as aggregator, can leverage its bargaining power to pursue a cleaner portfolio mix including renewable energy and efficiency programs.

What Cities are Doing Now

The **San Diego Apollo Alliance** has been working hard to implement CCA in **Chula Vista, California**. Chula Vista is one of two cities in the state that has passed an ordinance to implement CCA. Residents of San Diego County are paying some of the highest electricity rates in the nation and the highest in California. With CCA, Chula Vista can use the combined buying power of its residents to negotiate for more affordable power, to create a critical market for clean power and to retain local control of their energy supply. In order to implement CCA, Chula Vista must now negotiate a binding agreement with San Diego Gas and Electric, the city's current energy provider.

For more information

- Jennifer Badgely
- San Diego Apollo Alliance
- info@sdapollo.org

The **Northeast Ohio Public Energy Council** is the aggregator for Ohio's multi-city CCA program. NOPEC represents 94 communities spanning eight counties and 400,000 customers. NOPEC, after an open bid process, selected clean energy leader Green Mountain Energy as its utility provider. Their contract calls for two percent of the area's energy supply to come from qualified renewable resources; the other 98 percent must come from natural gas or a fuel with an equal or lesser emissions profile. In addition, the agreement calls for ten MW of new wind and 100 kW of new solar within Ohio. The contract is expected to save \$10 million over its duration.

For more information

- NOPEC
- 866.579.9487
- www.nopecinfo.org

Drive toward Energy Independence

Cities that are serious about energy independence and ending global warming must take a hard look at transportation fuels and vehicles. The United States has only three percent of the world's oil reserves, but accounts for over 25 percent of global demand for oil—and demand keeps growing.¹⁹ Luckily, cities are in a good position to stem this tide through serious changes in fuel consumption and vehicle use. Many cities have direct control over city fleet vehicles, city buses, school buses, and many other transit vehicles. Even where cities do not own their transit systems, they have bargaining power through the lucrative, sought-after contracts with the companies that do own these systems. And cities can offer incentives to private vehicle owners to encourage them to drive smarter and more efficiently.

Besides moving cities away from complete dependence on imported oil, switching to renewable fuels and high-technology vehicles is a good regional economic development strategy. The rural areas surrounding cities can often be the direct source for fuels such as ethanol and biodiesel. Community- or cooperatively-owned production facilities can bring dollars into those rural areas; at the same time, existing vehicle manufacturing facilities—often located in or near cities—can be upgraded and retooled to produce new generation cars and trucks that run on renewable fuel or renewable energy. In addition, cities can leverage the fuel needs of their fleets to encourage fueling stations to provide biofuels and biofuel blends. These strategies create jobs, improve air and water quality, and make cities healthier and more independent.

1 Clean and Efficient City Fleets

Cities and counties own large numbers of vehicles for use by public employees. Historically, efficiency and environmental impact have not been large considerations in these vehicles' purchase; however, some governments have begun taking steps to ensure that these vehicles operate more efficiently and cleanly. There are several options to make city fleets more efficient and environmentally friendly, the easiest of which is simply altering purchasing guidelines to favor the most fuel efficient vehicles available. Other options include:

- Purchasing alternative fuel vehicles like regular and plug-in hybrids, and vehicles that run on ethanol, biodiesel or compressed natural gas.
- Running vehicles on alternative fuels wherever possible. Existing diesel vehicles—including many school buses and trucks—can easily be converted to run on biodiesel, and some fleets may already include flex-fuel vehicles that can run on up to 85 percent ethanol.

What Cities are Doing Now

In 2005, Mayor Thomas M. Menino of **Boston, Massachusetts** traded in his SUV for a more fuel efficient vehicle and announced that all new vehicles purchased by the city will be alternative fuel source vehicles. The city will also convert its entire diesel fleet to run on biodiesel.

For more information

- Bryan Glascock
- Environment Department
- 617.635.3850
- Environment@cityofboston.gov
- www.cityofboston.gov/environment

The **New York City, New York** Alternative Fuels Program is working to replace New York City's public fleets with alternative fuel vehicles in order to promote and expand usage of alternative fuels. This effort began in 1993 with the conversion of 385 New York City municipal fleet vehicles to compressed natural gas (the New York City Fire Department prohibits use of any other type of natural gas in the city). Since that time, the Alternative Fuels Program has expanded significantly: there are now over 6,000 alternative fuel vehicles on New York City streets. The vehicles are a mixture of natural gas, hybrid, E85 (ethanol), and electric. New York City operates one of the largest municipal electric vehicle (EV) fleets (over 70 EVs) and one of the largest hybrid fleets (452 Toyota Priuses). As a result of this program, the city has reduced its fuel consumption by close to 283,906 litres a year and avoided emissions of an estimated 1,112 tons carbon dioxide, 1,581 kg nitrogen oxides, 2,930 kg carbon monoxide, and 550 kg volatile organic compounds per year.

For more information

- Office of Environmental Coordination
- 212.788.9956
- <http://www.nyc.gov/html/dot/html/motorist/alternativefuel.html>

Drive toward Energy Independence

1 Clean and Efficient City Fleets cont...

Seattle, Washington's city fleet of 3,250 vehicles uses 2.4 million gallons of gasoline and diesel each year. In 1992, the city changed its fleet purchase priorities to cut down on air pollution and improve fuel efficiency. The fleet now contains over 200 hybrid, electric and compressed natural gas vehicles, and at least half the compact cars purchased each year either run on alternative fuels or get at least 45 mpg. In 2001, the entire diesel fleet was converted to ultra-low sulfur diesel, and all heavy diesel trucks were retrofitted with pollution control devices. The new diesel fleet also uses a 20 percent biodiesel blend known as B20. The city has also downsized its fleet by at least 200 vehicles, in some cases replacing them with personal mobility vehicles (Segways™) for jobs like water meter reading. Segways™ have zero emissions, cost \$3/year to recharge and, in some cases, replace the use of a car.

Seattle is going even farther: on Earth Day 2003, the Mayor and City Council set a long term goal of having a 100 percent clean and green fleet. This year, the Office of Sustainability and Environment will complete a life cycle benefit cost analysis to determine the best mix of fuels and vehicles and the appropriate timeline for meeting the goal. At the same time, the city is launching an employee education campaign to encourage reduced vehicle idling and remind employees to consider alternatives to single driver travel, such as like teleconferencing and car pooling to meetings.

For more information

- Office of Sustainability & Environment
- 206.615.0817
- ose@seattle.gov
- http://www.ci.seattle.wa.us/environment/clean_air.htm

The **Medford, Massachusetts** climate action plan, adopted in October, 2001 states:

Whereas the City of Medford is committed to reducing its emissions of greenhouse gases and reducing air pollution, the City should require that all new vehicles purchased by the City for municipal use, be the most fuel-efficient vehicle in the class required for the job. Additionally, current vehicles in every department shall be evaluated to determine if the size and the fuel type of the vehicles are appropriate based on the frequency and the type of usage. Where feasible, the City of Medford should purchase smaller vehicles for each department.

For more information

- Energy and Environment Office
- 781.393.2137

Drive toward Energy Independence

2 Clean and Efficient Private Fleets

Cities can also encourage private companies to green their own fleets through grants, rebates, and other incentives.

What Cities are Doing Now

The **New York City, New York** Private Fleet Alternative Fuel/Electric Vehicle Program, administered by New York State's public benefits program (NYSERDA) in cooperation with New York City Clean Cities, helps New York City's private companies acquire Alternative Fuel Vehicles (AFVs). Participants in the program receive funds up to 50 percent of the incremental cost of purchasing new light-duty vehicles that operate on natural gas or electricity, and up to 80 percent of the incremental cost of purchasing new (or converting to) medium and heavy-duty compressed natural gas (CNG), electric, or hybrid electric vehicles. Eligible projects may also include installation costs for the infrastructure needed to fuel the vehicles.

For more information

- Lou Calcagno, Clean Cities Coordinator
- New York City Clean Cities Coalition
- 212.487.6820
- lcalcagno@dot.nyc.gov
- <http://www.nyserdera.org/Programs/transportation/AFV/NYCPrivateFleet.asp>

New York City is also greening its cabs. A program run through NYSERDA, the Clean Fuel Taxi Program, provides up to \$8,500 towards the purchase of new (or conversion to) compressed natural gas (CNG) taxis. About 300 CNG cabs are now in operation because of this program. Natural gas is available at a number of fueling stations across the city.

At the same time, the New York City Council recently passed legislation requiring the city's Taxi and Limousine Commission to approve at least one model of hybrid car for use as a New York taxicab (seven models have now been approved). Because each New York cab is estimated to drive 100,000 miles per year, drivers are expected to recoup the extra cost of the hybrid models within the first year of operation.

For more information

- Joseph Littmann, Jr., Manager
- NYC Regional Office
- NYSERDA
- 212.971.5342 ext. 3003
- <http://www.nyserdera.org/Programs/transportation/AFV/NYCFuelTaxi.asp>
- Todd Sigaty
- Coalition Advocating for Smart Transportation (CAST)
- 917.621.7167
- <http://www.smarttransportation.org/>

Policy link

- New York City "Clean Air Taxis Act" (NYC Administrative Code Chapter 19-533) can be found at: <http://public.leginfo.state.ny.us/menugetf.cgi>

Drive toward Energy Independence

3 Incentives for Efficient Car Use

Private automobiles are a vital part of the American economy. At the same time, there is no question that reducing our dependence on foreign oil requires us to reduce the amount of gasoline we use in our cars. Though city governments have direct control only over their own fleets, they can play a big role in encouraging residents to make efficient car purchases and use their vehicles more sustainably. The federal government and some state governments are now offering tax breaks or other incentives for consumers who choose efficient, hybrid or alternative fuel vehicles. City strategies include exemption from sales taxes, discounts on toll roads and parking, and access to HOV lanes.

There are many ways cities can provide transportation options and choices to their employees, including mass transit, shuttle buses, carpooling and vanpooling systems, bicycle and pedestrian infrastructure, and incentives related to all of the above. Programs that make it easier and safer to walk, bike and use mass transit include land use planning that sites housing near workplaces; adequate lighting; dedicated bike paths; adequate bike racks; and free or low cost transit passes. Programs that promote less car use include preferential parking for carpools and for efficient vehicles and carsharing services. Cities can and should also provide incentives to use alternative transportation, including financial incentives (such as discounts on bike maintenance or coupons to local eateries), choice based programs (such as allowing employees to choose a parking permit or a free bus pass, but not both), and preferential treatment (such as premium parking spots for carpools).

What Cities are Doing Now

Berkeley, California contracted with a car sharing company to replace 15 of its older fleet vehicles with five hybrid carshare cars. City employees have exclusive access to those five cars during business hours, but during the evenings and weekend any member of the car sharing organization may reserve one of the cars for their own use. The innovative partnership saves Berkeley taxpayers hundreds of thousands of dollars and provides access to an alternative to car ownership for Berkeley residents.

For more information

- Office of the Mayor
- 510.981.7100

Austin, Texas offers \$100 in free parking for residents who drive hybrids that meet the EPA's Green Vehicle Guide. The city issues pre-paid credit cards for any of the city's 3700 parking meters to drivers who register their clean hybrids with the city.

For more information

- Matt Curtis, Aide to Mayor Will Wynn
- 512.680.2509

Madison, Wisconsin's Employee Bikes at Work Program was created to provide city of Madison employees with bicycles for use as part of the transportation fleet during working hours. The city presently has five bicycles, which are available on a first come, first serve basis. Helmets, locks, and keys are also provided.

For more information

- Arthur D. Ross, Pedestrian-Bicycle Coordinator
- 608.266.6225
- aross@cityofmadison.com

In 1992, the California Assembly enacted a Parking Cash-Out law. The law applies to employers of 50 or more located within a non-attainment area who do not own parking space, but subsidize the cost of their employee parking. These employers must offer employees the opportunity to "cash out", or receive the cash value of the subsidy, instead of the parking space. **Santa Monica, California** is located within an ozone non-attainment area and enforces this law through its Transportation Management Plan ordinance. Currently, nearly 33 percent of all Santa Monica employers with 100 or more employees, and ten percent of employers with 50–99, operate a Parking Cash-Out program.

For more information

- Jacquilyne Brooks de Camarillo, Transportation Management Specialist
- 310.458.8956

Drive toward Energy Independence

4 Improving Mass Transit

Mass transit is at the heart of any smart growth policy, because it allows people to get from home to work in the most efficient, least environmentally-harmful way possible. Mass transit in the form of buses or rail can save energy, reduce pollution, reduce the need for parking, alleviate congestion, and provide economical transportation alternatives. In many congested inner cities using mass transit is also faster than driving a car. Cities can invest in mass transit by diverting federal transportation dollars to buses, light rail systems, and—on a more regional scale—inter-city rail. One public transit system, bus rapid transit, has proven to be both cost efficient and popular with riders. In these systems, buses run on a dedicated lane separated from traffic, with its own timed traffic signals. Allowing buses to bypass car traffic congestion dramatically speeds up bus travel, and makes buses highly competitive with private cars for commuters.

Cities can also run buses, the predominant form of mass transit in the United States, on biodiesel. Local governments might even consider starting a citywide waste vegetable oil collection service to run the buses.

What Cities are Doing Now

The regional transit authority for **Cleveland, Ohio** is constructing exclusive bus lanes that connect the city's center to the residential east side. The 5.2 mile line runs through a formerly grand Cleveland neighborhood that has slipped into decline; planners anticipate the bus system acting as an economic catalyst for this area.

For more information

- Cleveland Regional Transit Authority
- Euclid Corridor Transportation Project
- 216.771.4144
- www.euclidtransit.org/home.asp

In 2000, **Cincinnati, Ohio** switched 288 buses to a 20 percent biodiesel blend. In doing so, the city improved air quality and reduced dependence on foreign oil. In 2005, the city upped the blend to 50 percent April through October. This increase will make the Cincinnati Metro one of the largest biodiesel users in the nation, consuming about 1.3 million gallons a year. Budget is the primary reason for this aggressive use of the alternative fuel—Metro's 390 buses use about 3.6 million gallons of fuel per year. The biodiesel is manufactured locally from Ohio soybeans and the city saves about \$1 for every gallon of biodiesel purchased through an arrangement with its local fuel supplier.

For more information

- Sallie Hilvers
- Cincinnati Metro
- 513.632.7681

Drive toward Energy Independence

5 Upgrading Traffic Signals and Street Lights

There are literally billions of traffic signals owned and operated by local governments in the United States. These run twenty-four hours a day and consume a significant amount of energy. Historically these signals have used incandescent bulbs, but recently states and cities have taken the initiative and begun replacing incandescent signals with more efficient light-emitting diode (LED) signals, which use 90 percent less power, last ten times longer, and appear brighter than traditional incandescent bulbs.

What Cities are Doing Now

Denver, Colorado was a pioneer in the use of LED traffic signals and continues to have the largest LED traffic signal inventory in the United States, saving nearly \$800,000 annually in energy, materials and labor costs. In terms of emissions reduction and public health, this program reduces pollutants by an amount equivalent to the effects of planting more than 777 acres of trees or the permanent removal of 371 automobiles from local roads.

For more information

- Beth Conover, Advisor to the Mayor
- 720.865.9090
- beth.conover@ci.denver.co.us

Passaic, New Jersey partnered with a private company called Public Energy Systems to replace the incandescent traffic signals at 40 city intersections. By installing LED signals at these locations, Passaic will save over \$65,000 annually in energy and maintenance costs.

For more information

- Robert Lesch
- Public Energy Solutions
- 866.818.1900 ext. 102
- www.publicenergysolutions.com

Saint Paul, Minnesota was the first local government in the state to install LED traffic signals in all colors—red, green, yellow and white. By using state joint power purchasing agreements, St. Paul kept project costs very low.

For more information

- John Maczko
- Department of Public Works
- 651.487.7206

Drive toward Energy Independence

6 Green Infrastructure

One of the best ways cities can help improve their air quality and dependence on foreign oil is to begin building the infrastructure that supports privately-owned biofueled vehicles. A city's residents are unlikely to seek out and purchase alternative-fueled vehicles if they are unsure where they'll be able to fill them up.

Cities can help owners of fueling stations access state and federal funding to help them convert existing pumps to dispense E85, or build new E85 pumps. In addition, cities are exploring the idea of becoming biodiesel producers, with innovating partnerships that collect waste vegetable oil and process it into biodiesel.²⁰

What Cities Counties are Doing Now

The office of **Salt Lake City, Utah** Mayor Ross C. Anderson provides salary and operation funds for Utah Clean Cities Coalition in conjunction with the Utah Energy Office. The Utah Clean Cities Coalition competes for federal funds to support local clean fuel projects, including the construction of alternative fuel infrastructure.

For more information

- Beverly J. Miller, Director
- Utah Clean Cities
- 801.535.7736
- beverly.miller@slcgov.com

Mayor James Brainard helped secure construction of the first E85 pump in **Carmel, Indiana**.²¹ Faced with declining air quality and EPA non-attainment status that restricts federal highway funds, Mayor Brainard issued an executive order requiring that all newly purchased city vehicles be alternative fuel-compatible, and met with local fuel station owners to encourage them to add E85 pumps.

For more information

- Office of Mayor Jim Brainard
- 317.571.2401
- jbrainard@carmel.in.gov

Hamilton County and the city of **Cincinnati, Ohio** are working together to plan a pilot project that would collect waste vegetable oil from local businesses and convert it to biodiesel for use in city and county vehicles. While the project is still in development, it could provide a low-cost, environmentally-friendly fuel for the city and county, while reducing waste.²²

For more information

- | | |
|--|--|
| • Deborah Holston, Assistant City Manager | • Todd Portune, Hamilton County Commissioner |
| • 513.352.5335 | • 513.946.4401 |
| • deborah.holston@cincinnati-oh.gov | • todd.portune@hamilton-co.org |

Policy link

- Minutes from Hamilton Solid Waste Management District Policy Committee Meeting:
<http://www.hcdoes.org/sw/Policy/november%2010/090105Minutes.pdf>

Build High-Performance Cities

As more and more Americans move to cities and suburbs, local governments are faced with the challenge of managing future growth in a way that is environmentally and economically smart. Many of the activities associated with urban growth—new construction, road-building, expansion into former agricultural land—rely on enormous amounts of electricity and fuel. Cities are stuck with the utility bills of many of these buildings and roads for years into the future.

City and town governments that are forward-thinking about future growth can ensure that their ecological footprint is smaller, and their utility bills lower, than if they simply sat back to watch urbanization happen around them. They can also provide their residents with thousands of jobs as they construct smarter urban spaces and transit systems. To this end, many cities have incorporated “smart growth” policies that rely on redeveloping and retrofitting existing buildings and infrastructure, giving incentives for residents to live near transit and jobs, and preserving open space. These policies are truly energy-saving, in they ensure that residents live closer to jobs and transit hubs, and that rural areas are protected from overdevelopment.

What Cities are Doing Now

The best overall model for Smart Growth planning at the local level is **Portland, Oregon**. Portland’s elected regional government entity, Metro, has passed a comprehensive long-term plan (the 2040 Growth Concept) that calls for efficient land use, farm and forest land protection, a balanced transportation system, a healthy economy, and diverse housing options for the region. Metro also manages the city’s existing urban growth boundary, and has instituted a plan to develop a series of interconnected parks and open spaces within the city.

Recently, Metro proposed a \$227 million bond package designed to preserve natural areas and protect water resources at the regional, local, and neighborhood level. The bond would be financed by a small property tax assessment of \$30 per household per year.

For more information

- Metro Land-Use Planning
- 503.797.1939
- 2040@metro-region.org
- www.metro-region.org

Another city that has emerged as a leader on large-scale commitments to smarter growth and better energy planning is **Seattle, Washington**. In early 2005, Seattle Mayor Nickels started a campaign to get cities across the country to commit to reducing their greenhouse gas emissions by 7 percent below 1990 levels by 2012. Since then, over 230 mayors—plus the U.S. Conference of Mayors—have signed onto the campaign, known as the U.S. Mayors Climate Protection Agreement.

At the same time he launched this campaign, Mayor Nickels appointed a Green Ribbon Commission on Climate Protection to develop local policies to help reach the 7 percent goal. The Commission’s report, released in March 2006, identifies a comprehensive suite of key policies for the city, including investments in public transit and bicycle options, channeling development dollars toward high-density, transit-friendly projects, and increasing fuel and energy efficiency throughout the city.

For more information

- Steve Nicholas, Director
- Office of Sustainability & Environment
- 206.615.0829
- steve.nicholas@seattle.gov

Policy Links

- Home page for the U.S. Climate Protection Agreement:
<http://www.ci.seattle.wa.us/mayor/climate/>
- Report and Recommendations from the Green Ribbon Commission:
<http://www9.seattle.gov/climate/PDF/SeattleClimateReport.pdf>

Build High-Performance Cities

1 Rehab Building Codes

One of the most important ways that cities can lower pollution levels and energy bills is to invest in rehabilitation and retrofitting existing neighborhoods rather than abandoning these areas and moving outward. Cities can help make it cost-effective for developers to invest in rehab projects by implementing progressive building codes that set different standards for rehabilitation projects than for costly new construction. Over the past ten years, a number of cities have added such “rehab codes” to their building codes, resulting in significant inner-city redevelopment.

The Apollo Alliance supports rehab codes that lower the bar to inner-city renovation projects, and that also provide incentives (such as shortened permit schedules) for projects that adhere to IECC standards for energy efficiency, or LEED standards for green building. (See create “High-Performance Buildings” section.)

What Cities are Doing Now

In 2001, **Wichita, Kansas** passed the Wichita Existing Buildings Rehabilitation and Change of Use Code, which provides a consistent set of regulations for rehabilitation and redevelopment of existing buildings. Before the code was enacted, rehab projects were regulated at the discretion of the city’s building inspection department, making the permitting process lengthy, costly, and confusing for developers. An example of a project built under the code is the Harvester Lofts in downtown Wichita, built in a vacant 1914 warehouse. The project is successful from both an energy-efficiency and an equity perspective: thirty of the 48 total units are affordable to Wichita residents making less than 60 percent of Area Median Income. Altogether, in the two years after the code went into effect, the city saw 182 downtown renovation and construction projects, accounting for over \$38 million in economic activity in Wichita’s center city.

For more information

- Wichita Office of Central Inspection
- 316.268.4460
- Gary Hassenflu, President
- Garrison Development Company (Developer of Harvester Lofts project)
- 913.362.9816

Policy links

- IBEC (ICC’s International Existing Building Code): <http://www.iccsafe.org/e/prodshow.html?prodid=3551CD03> (available for purchase).
- Excel spreadsheet of IBEC adoption by state and/or local governments: <http://www.iccsafe.org/government/state-local.html>

Seattle, Washington just passed an amendment to its Land Use Code that allows a developer to build at a higher density than is normally allowed under the code, so long as the developer can certify that the building will be rated LEED Silver or its equivalent. The amendment applies only to buildings in downtown commercial districts.

For more information

- Rebecca Herzfeld, Council Central Staff
- Seattle, WA
- 206.684.8888
- rebecca.herzfeld@seattle.gov

Policy link

- Amendment to Seattle Municipal Code 23.49.01, as approved by the Seattle City Council on April 3, 2006: <http://www.seattle.gov/council/attachments/2006cb115524.pdf>
- For more information on rehab codes around the country, see Phil Mattera, *Breaking the Codes: How State and Local Governments are Reforming Building Codes to Encourage Rehabilitation of Existing Structures* (Good Jobs First, 2006), available at www.goodjobsfirst.org.

2 Brownfield Redevelopment

Besides investing in existing buildings, cities can expand more efficiently by building on small pockets of open space in center cities. Some of the last remaining open space within city boundaries is “brownfield” land—land that once housed industrial or commercial facilities, and is often contaminated with toxins. Developers have begun to see the benefits of investing in brownfield land, now that remediation technology has become relatively inexpensive. Buildings erected on these sites can be financially lucrative, due to their easy access to public transportation; proximity to shopping, restaurants and other amenities; available, existing infrastructure and services, and lower property taxes.

What Cities are Doing Now:

In 1996, **Cadillac, Michigan** created the first Brownfield Redevelopment Authority (BRA) in the state. The BRA uses tax increment financing (TIF) revenues generated from specific brownfields to fund environmental clean-up, as well as site preparation and public infrastructure improvements on these sites. There are now BRAs throughout Michigan; these tax incentives are generally used to redevelop decommissioned service stations into office buildings, commercial properties, and parks.

For more information

- Peter Stalker, City Manager
- 231.775.0181 ext. 119

Policy link

- General information about Brownfield Redevelopment Plans in Michigan, including supporting statutes:
<http://www.michigan.org/medc/services/general/cat/guide/index.asp>

3 Location Efficient Mortgages

One complaint about housing near transit hubs is that it is often priced too high for the middle- and lower-income people who most benefit from the proximity to mass transit. A good way for cities to promote affordable housing near transit is to work with local mortgage brokers and affordable housing agencies to implement location-efficient mortgage, or LEM, programs. LEMs allow homebuyers to capitalize on the savings that result from living near transit service (e.g., savings from not owning and operating a car—approximately \$6500 per car per year for the average American household), by calculating these savings into the purchasing power of the homeowner. The result is increased borrowing power of \$30K-\$50K in dense communities that are well-served by transit. LEMs are currently offered in Seattle, San Francisco, Los Angeles, Chicago, and Madison, Wisconsin. Some of these cities combine the LEM program with a free or discounted bus or transit pass.

What Cities are Doing Now

In **Chicago, Illinois**, where the LEM concept originated as a project of the Center for Neighborhood Technology (CNT), the city’s Department of Housing incorporated the LEM concept into its broader CityMortgage initiative, which offers a low interest rate, low down payment, and flexible mortgage terms to Chicago homebuyers. In 2001, the Chicago Department of Environment offered a voucher worth \$900 toward the purchase of an EnergyStar refrigerator or washer/dryer set to the first 100 LEM borrowers under the CityMortgage program.

For more information

- Dave Chandler
- Center for Neighborhood Technology
- 773.278.4800, ext. 123
- david@cnt.org
- Fannie Mae Consumer Resource Center
- 800.732.6643

For more information on Location Efficient Mortgages, see the LEM website at <http://www.locationefficiency.com>

Build High-Performance Cities

4 Transit-Oriented Development (TOD)

Revitalizing central cities, so that construction takes advantage of existing infrastructure and utility networks, is one way to decrease a city's fossil fuel use. Another is to help urban residents spend less time in their cars, by encouraging housing near mass transit hubs such as bus, subway and light rail stations. More and more, cities are encouraging this "transit-oriented development," or TOD, through tax incentives and strategic mortgage policies. Cities can also encourage TOD by allowing developers to build fewer on-site parking spaces in housing near transit, which dramatically lowers the cost of development.

The best TOD policies link tax incentives for new development not only to transit-friendly locations, but also to good jobs. A model Apollo Alliance TOD program would include a requirement that any developer receiving TOD funding or incentives would have to include local hire and/or apprenticeship policies in their development plans.

What Cities are Doing Now

Construction is due to start in 2006 on a TOD project in **Milwaukee, Wisconsin**. When two freeway ramps were torn down on the northern side of downtown Milwaukee, city activists and unions formed a coalition to ensure that any new development incorporate transit access, good jobs, and environmental benefits. The Good Jobs and Livable Neighborhoods Coalition and the city of Milwaukee ultimately signed a Community Benefits Agreement (CBA) that conditions the sale of city land freed up by the freeway demolition on a number of community benefits. Important features of this CBA include access to mass transit, along with:

- Prevailing wage for construction-phase jobs,
- 25 percent of construction-phase jobs in minority- or women-owned firms,
- 25 percent of construction employees to be minorities or women,
- Living wage or market wage (whichever is higher), plus benefits, for post-construction jobs,
- Local hire and training provisions, including first-source hiring,
- Green space and green design incorporated into all proposals,
- Community involvement in proposal review and acceptance.

For more information

- Bob Dennik, Director
- Milwaukee County Economic Development Division
- 414.278.4083
- RDennik@milwcnty.com

Policy link

- Information on the Park East CBA, including the final legislative language, can be found on the Institute for Wisconsin's Future website: <http://www.wisconsinfuture.org/workingfamilies/econdev/index.htm>.
- For more information on the links between TODs and jobs, see Sarah Grady and Greg LeRoy, *Making the Connection: Transit Oriented Development and Jobs* (Good Jobs First, 2006), available at <http://www.goodjobsfirst.org/pdf/makingtheconnection.pdf>.

5 Stop Subsidizing Sprawl

As cities encourage downtown, transit-friendly development, they should also try to limit aggressive suburban sprawl. Limiting sprawl helps cities conserve energy and resources by decreasing commute times and thus improving air quality and community health. It also helps maintain open space such as agricultural and forest land, which allows more groundwater absorption and limits flooding. Finally, managing sprawl helps to keep central city residents closer to regional labor markets, which has overall benefits to the urban economy.

One simple way that cities and regions can act to curb suburban sprawl is to stop subsidizing this kind of development. Policies to accomplish this goal include:

Fees and Charges for Infrastructure Development

One way that cities and, perhaps more important, counties and metro regions can curb sprawl is to actually assess the costs of new development on suburban developers and residents. In most cities, the full cost of building the infrastructure for a new suburban community—building new schools, extending utility and sewer lines, and building roads—is incorporated into the city’s existing budget rather than charged to suburban developers. As a result, the cost of suburban development is artificially low for these developers, while city taxpayers pick up the bill. A way to combat this is to charge new developers impact fees or infrastructure fees for development. This policy does not stop sprawl, but it does make central city development more competitive with suburban development.

What Cities are Doing Now

Lancaster, California has one of the most comprehensive “distance-based” impact fees—fees based not on provision of particular services such as roads, but on the actual distance of the new development from the central city. In 1992, Lancaster modified its original impact fee schedule to include a distance multiplier. The city identified a core urban area with a five mile radius. Beyond that core, the city imposes impact fees on developers which increase with each mile outside the core. Fees are used to offset infrastructure costs including: street improvements, traffic signals, drainage/flood control, water and sewage lines, and park/open space development.

For more information

- Planning and Development Services Division
- 661.723.6000
- <http://www.cityoflancasterca.org/dpt.comdev.pds.php>

Policy link

- Lancaster City Code §15.64:
<http://municipalcodes.lexisnexis.com/codes/lancaster/>

DuPage County, Illinois assesses transportation impact fees based on the type of property (e.g. residential, commercial-industrial, commercial- retail, etc.) being proposed for development. The county then assigns each property a fee based on potential traffic generation, trip length associated with the land use, and the percentage of DuPage County road miles in the impact fee service area. Developers can mitigate or offset their impact fees in a variety of ways, for instance by providing roadway system improvements as part of the development. In an effort to encourage rehabilitation of existing structures, the county also allows impact fee offsets for projects that use all or a portion of an existing building in the new development.

For more information

- DuPage County Division of Transportation
- 630.407.6900

Policy link

- DuPage County Department of Transportation, Transportation Impact Fee Procedures Document: <http://www.dupageco.org/emplibary/ACF26C9.pdf>

Build High-Performance Cities

5 Stop Subsidizing Sprawl cont...

TIF Reform

Tax incremental financing (TIF) is an extremely popular development tool available to local communities in 48 states. TIF works as follows: a municipality designates a specific geographic region where it wants to promote development. At this time, the city determines a base value for all property within the region. As the municipality invests money in the district, the tax revenue on any property value growth above this base value—known as the “increment”—is used to pay off the costs of those improvements

This type of financing was originally intended to help struggling urban areas attract new development. However, it is increasingly used for greenfield, sprawling developments. Because open farmland’s initial property value is so low, TIF projects that include open land generate a great amount of increment, paying themselves off quicker than redevelopment TIF districts. Cities can reform TIF laws to focus the subsidy on infill and redevelopment projects, rather than on projects that eat up productive farmland.

What Cities and States are Doing Now

Wood River, Illinois established a TIF policy which limits the use of TIF funds for greenfield development. The policy requires that if a TIF proposal contains vacant land, it must conform to the City’s plans and programs and serve as a catalyst for further, high quality development or redevelopment. This policy ensures that all TIF-financed development proposals meet the surrounding community’s goals for orderly and paced development.

For more information

- Nancy Schneider, Finance Director
- 618.251.3131

The **State of Missouri** recently passed 2006 Senate Bill 832, which prohibits the use of TIF funds for any greenfield residential development. While the legislation still allows for TIF-subsidized retail, commercial, and industrial greenfield development, it does provide a model for actions to contain sprawling development. Because TIF is a locally administered program, cities can establish their own TIF policies that prevent any TIF funds going to greenfield development.

For more information

- Senator John Greishiemer
- Missouri State Senate
- 573.751.3678

Policy link

- Bill Summary and Links for Missouri 2006 Senate Bill 832: http://www.senate.mo.gov/06info/BTS_Web/Bill.aspx?SessionType=R&BillID=21450

6 Smart Grid Expansion

When it comes to smarter and cheaper energy use, upgrading the utility grid is probably the most important infrastructure investment cities can make. “Smart grids,” a relatively new concept for U.S. cities, use existing digital technology to react in real time to power grid problems or price spikes by sending signals to customer homes and appliances telling them to reduce energy use during these times. Even more advanced grids incorporate distributed generation, meaning that the grid has a variety of power sources feeding into it (e.g. traditional power plants, wind turbines, solar panels, small hydropower) and can moderate the amount of power coming in from each source based on the availability and cost of that power. For example, if one power plant goes offline in a city (because of natural causes or an outside attack), a smart grid with distributed generation would know to switch gears and become more dependent on other, more reliable sources.

Smart grids are key to energy efficiency and cost savings because they direct energy where it is most needed at the time it is most needed, instead of keeping all systems on full power all the time. These systems also provide extensive usage and pricing information to consumers, allowing them to better monitor their own energy use. Finally, in this time of energy instability, smart grids with distributed generation can provide some degree of comfort that an attack on a city’s power systems might

not completely shut that city down.²³

What Cities are Doing Now

The cities of **Yakima, Washington** and **Gresham, Oregon** are currently participating in a pilot smart grid project with the U.S. Department of Energy’s Pacific Northwest National Laboratory (PNNL), Whirlpool, and IBM. Three hundred households are involved in the project, which includes real-time monitoring of consumption and pricing, web-based energy use controls that consumers can access, and “smart appliances” able to respond to price spikes and grid problems. The project also includes a distributed generation system of small wind turbines.

For more information

- Rob Pratt, GridWise Program Manager
- Pacific Northwest National Laboratory
- 509.375.3648
- <http://www.pnl.gov/>

Financing the Clean Energy Future

The policies discussed in this report will nearly all save cities money in the long run. But some of these projects take significant start-up capital—capital cities and their residents do not always have on hand. Cities do have a range of options for ways to raise capital for energy efficiency and renewable energy projects, however. Cities can leverage their bond ratings to get good financing for these projects, and to lower the risk for outside investors. They can invest a small percent of their city employees' pension funds in efficiency and renewable projects with good returns—often better returns than these funds would get from the stock market. And they can dedicate their savings from earlier clean energy projects for investment new programs, as new technology is developed.

1 Clean Energy Funds

One way to develop funding streams for renewable and efficient energy projects is to leverage public and private money to create a dedicated lending institution for clean energy projects. Because energy efficiency upgrades are typically able to pay for themselves over time, setting aside a revolving fund dedicated to efficiency investments makes good sense. Setting aside a dedicated pool of capital for renewable/efficiency projects ensures these important project will benefit from low- or no-interest loans and won't have to compete for funding in the annual budget process.

Loan funds differ in two ways—which types of projects they fund (public or private), and their source of capital (public or private). Some cities have set aside public money for the specific purpose of funding continual efficiency upgrades on their building stock. Others have pursued a mix of public and private money to fund efficiency and renewable projects on public and privately-owned property.

A final way to increase funding for renewable and efficiency projects is to pledge a city's unused assets as collateral for a dedicated renewable/efficiency loan fund. A city's unused assets can include the value of property in parks, foreclosed homes, and vacant lot held by the city. By pledging these assets as collateral, cities can significantly increase the number and dollar size of community and economic development investments, without additional public funding.

What Cities are Doing Now

Duluth, Minnesota maintains a revolving fund to finance local energy-efficiency improvements. Fifty percent of savings from each project is available for future energy-efficiency improvements. The mechanism supports continuous efficiency improvements without having to compete for funding in the annual budget-setting process.

For more information

- Sandy Sweeney, Energy Manager
- 218.730.5182
- ssweeney@ci.duluth.mn.us

Escanaba, Michigan partnered with a local technical college and energy efficiency business to apply for state money to form a revolving efficiency fund. The State of Michigan awarded \$2 million for a set of improvements to Delta County government buildings. One of the first projects was a set of retrofits to Delta County's courthouse, its jail, and a county office building in 2003. Annual cost savings are estimated at \$8,000, and the repayment of the loan—expected within seven years—is coming from the energy cost savings.

For more information

- Douglas Russell
- Bay de Noc Community College
- 906.786.5802 ext.1210

Milwaukee, Wisconsin is working with Wall Street Without Walls to establish a fund that collateralizes unused city assets for dedicated loan funds that will be accessible by minority-owned businesses. Mayor Tom Barrett has pledged to take a leading role in assembling unused city assets and soliciting asset contributions from local companies for the fund. While this is not specifically an energy strategy, it is one that improves the quality of life for Apollo's community partners in Milwaukee.

For more information

- Greg Stanton, Co-Director
- Wall Street without Walls
- New York City, NY
- 212.712.2759
- greg.stanton@wallstreetwithoutwalls.com

Financing the Clean Energy Future

2 Bonding Initiatives

In 2004, local and state governmental bodies financed nearly 9,000 individual projects with about \$230 billion in municipal bonds.²⁴ Public bonds take many forms, but the most common are revenue bonds and general obligation bonds. These bonds are sold to individuals, investors, pension funds and corporations who provide up-front investment money in exchange for a guaranteed rate of return on that investment. Issuing bonds allows governments to fund large-scale renewable and efficient energy projects without raising taxes, or can loan out money to businesses to install renewable energy systems or retrofit their facilities with energy efficient infrastructure.

Revenue bonds are public bonds that incorporate a specific payback mechanism into their design. Often they are paid off through fees or income generated through the project funded. Energy efficiency projects fit this bonding scheme particularly well because the revenue needed to repay the bonds can be recouped in long-term energy cost savings. So long as the money saved from lower energy bills is funneled back into the bond payback program, revenue bond financing of energy efficiency projects allows states or municipalities to reduce energy usage without any actual outlay of city funds.

General obligation bonds are bonds without a specific payback mechanism. These bonds leverage a city's credit rating to secure low-interest financing for public projects and are paid off over time through tax revenues. Because general obligation bonds finance much of the development in cities, some communities are using the bonding process to ensure environmentally-friendly development patterns. An emerging approach in this area is climate neutral bonding. Climate neutral bonding policies require that bond-funded development cause no net increase in greenhouse gas (GHG) emissions within the bond issuing agency's geographical jurisdiction after the project becomes operational.²⁵ Such policies ensure that we consider the environmental effects of development and develop markets for green power purchases, as cities seeks new ways to offset increases in GHG emissions from development.

What Cities are Doing Now

The cities of **Hibbing** and **Virginia, Minnesota** used \$84 million in revenue bonds as the primary financing mechanism to repower two older coal-fired power plants with locally-sourced biomass material. The Laurentian Energy Authority, a joint venture of the two cities' public utilities, seeks to capitalize on the market created by Minnesota's renewable energy requirements. The repowered plants will produce 35 MW of renewable power from biomass, preserve 70 existing jobs and create 60–100 new jobs in the communities. The project will use biomass grown and harvested by local loggers, stored at a separate wood yard between the two cities. These bonds will be repaid by monies generated by the project.

For more information

- Terry Leoni, General Manager
- Virginia Department of Public Utilities
- Virginia, MN
- 218.748.7564
- leonit@vpuc.com
- Jim Kochevar, General Manager
- Hibbing Department of Public Utilities
- Hibbing, MN
- 216.262.7728
- jimk@hpuc.com

Lamar, Colorado's public utility, Lamar Light and Power, is partnering with the Arkansas River Power Authority to build a 6 MW wind farm southeast of the city. The site will consist of four 1.5 MW wind turbines, three of which will be owned by the city of Lamar. The project is being funded by the sale of \$6,000,000 of revenue bonds by the Lamar Utilities Board. The bonded indebtedness is for 20 years with annual payments in excess of \$400,000. The generated cost of the power is estimated to be between \$.04 and \$.045 per kilowatt-hour, which compares favorably with other Light and Power resources; this cost may be reduced if Lamar Light and Power qualifies for Renewable Energy Credits provided by the Department of Energy and/or the sale of environmentally friendly "green tags."

For more information

- Department of Light and Power
- 719.336.4376
- <http://www.ci.lamar.co.us/lightpower/index.html>

Financing the Clean Energy Future

3 Pension Fund Investments

City governments control a remarkable amount of resources in the form of their employees' monthly contributions to pension funds. These funds are administered by city staff or outside fund administrators, who are charged with investing this money to achieve asset growth. One emerging approach is to invest this pension money into energy efficiency and renewable energy programs for government-owned infrastructure. Energy savings resulting from these infrastructure upgrades are then used to repay the capital costs of the programs, plus an investment fee to the pension funds. Once the program has been paid off, the state receives revenue in the form of decreased energy costs.

The Apollo Alliance recommends that city treasurers invest a portion of their pension fund into a comprehensive retrofit of all city-owned buildings. Any excess funds should be directed into private equity investments for environmental technologies. Technologies can include renewable energy, fuel cells, water purification, recycling technologies and waste reuse technologies.

What Cities are Doing Now

The **Los Angeles Apollo Alliance** has proposed creating a \$100 million SustainLA fund to finance green building projects, job training and job creation. The fund would be established by diverting 0.5 percent of the city's investment portfolios and pension funds into large public works projects that could help shape the regional economy and provide training and employment for thousands of city residents. Since the rate of return on energy efficiency investments is often higher than that of the stock market, such a fund would benefit the city financially as well.

For more information

- SCOPE/Los Angeles Apollo Alliance
- 323.789.7920

What States are Doing Now

The only existing pension fund investment in clean energy is at the state level: California's Green Wave program. The program directs California's two largest pension funds, the California Public Employees' Retirement System (CalPERS) and the California State Teachers' Retirement System (CalSTRS) to invest roughly \$1.5 billion into the clean energy industry, including \$200 million in investments for Real Estate audits and energy efficiency retrofitting. These investments should save an estimated \$40 million dollars annually in the aggregate, equating to an Internal Rate of Return (IRR) of 14.16% over ten years, with a 5-year payback period.

For more information

- Office of Treasurer Phil Angelides
- Sacramento, CA
- 916.653.2995
- <http://www.treasurer.ca.gov/greenwave>

4 Energy Savings Performance Contracts

Energy Savings Performance Contracts enable governments, industrial firms and property managers to contract with companies specializing in energy efficiency, called Energy Service Companies (ESCO). ESCOs provide customers with detailed assessments of guaranteed energy savings. ESCOs then perform the efficiency retrofits requiring no up-front costs and assuming all risks; they recoup these costs through energy savings. If energy savings goals fall short, the ESCO will provide the customer with a check for the difference, although savings typically exceed projected amounts within two to ten years.²⁶ Departments should see additional savings beyond the amount needed to repay the financing from utility rebates, lower oil surcharges, and reductions of utility demand charges.

ESCO projects have a long history of generating significant energy cost savings, much of which is realized through lighting and HVAC work. Retrofits of lighting alone typically achieve a median 47 percent savings over the existing lighting costs. Projects that target energy savings both in lighting and non-lighting improvements reduce total electric bills significantly, with a median savings of 23 percent.²⁷ ESCOs are not just a cost-effective method of achieving energy savings; they are also a job creation tool. A 2002 analysis by the National Association of Energy Service Companies and Lawrence Berkeley National Laboratory suggest that ESCOs provide between \$1.9 billion and \$2.1 billion in energy efficiency services annually.²⁸ Approximately one third of this money goes directly to labor costs.²⁹

What Cities are Doing Now

Redlands, California contracted with a private company, Honeywell, to conduct upgrades on city's HVAC equipment, wastewater pumps, lighting systems, irrigation systems, and sensors. In all, the company conducted upgrades on twelve buildings that save the city over \$450,000 per year in energy costs. Honeywell fronted the capital investment for these upgrades and was repaid through the energy savings over a seven year period.

For more information

- Ron Mutter
- Department of Public Works
- 909.798.7655

Little Rock, Arkansas administers a performance contract between the city and a private contractor to perform energy efficient retrofits funded by energy savings. The current program guarantees an annual savings of \$320,316 from efficiency retrofits such as installation of efficient lighting systems, conversion of traffic signal lights from incandescent to LEDs computerized control of heating and cooling systems (HVAC), installation of a geothermal HVAC system.

For more information

- Jessie Tringleth, Manager
- Building Services Division
- 501.918.3664
- jtringleth@littlerock.org
- www.littlerock.org/CityDepartments/PublicWorks/BuildingServices

Building a Workforce for the Clean Energy Future

Many of the financing mechanisms that we recommend involve some sort of government subsidy or tax break to private companies that produce, buy, sell or distribute energy efficient or clean energy products. Cities can and should attach job quality and job training standards to these types of subsidies to achieve greater public benefit. Essentially, these standards require that any business receiving a government subsidy or tax credit must provide employees decent, family-supporting wages and/or benefits. These standards ensure that new jobs created will be “high road” jobs: providing a decent income and health benefits, and helping residents avoid the “hidden taxpayer costs” that occur when working families rely on government subsidies like food stamps, Medicare, and the Earned Income Tax Credit.

High-Priority Job Quality and Training Standards for Local Energy Projects

- Prevailing wage or self-sufficiency wage plus adequate health benefits
- County-wide local-hire commitment
- Ties to state-approved apprenticeship programs
- Job preparation training in coordination with community-based job training programs (pre-apprenticeship) prior to staffing
- Commitment to compliance with state and federal labor laws
- Commitment to safe and healthy work environments
- Appropriate level of workers compensation

1 Job Training Standards

A key component of the Apollo Alliance clean energy/good jobs strategy is developing a workforce that is trained to fill those jobs. Because many jobs associated with energy efficiency and renewable energy are relatively new, communities may have to develop new strategies and policies to help workers access these jobs—or at least they will have to integrate existing workforce development and training opportunities more fully into the emerging green economy. How communities approach workforce development for green jobs is crucial, as these programs can make the difference between a “high-road” economy with good, family-supporting jobs filled by local workers, and a “low-road” economy with imported, low-wage labor.

Regional Energy Industry Partnerships

One way that cities can approach the workforce development challenge of the new energy future is to facilitate regional industry partnerships made up of the industries involved in the energy economy—manufacturers, installers, and operations specialists—along with representatives from local government, labor, and regional technical colleges or other training institutions. These partnerships can work together to identify the energy industry’s major workforce needs, and can design a training curriculum best suited to meet those needs. Involving labor representatives ensures that training does not just happen for new employees, but also on the job throughout each worker’s time in the industry.

What Cities are Doing Now

In 2005, **Milwaukee, Wisconsin** Mayor Tom Barrett brought together a “Green Team” made up of government, non-profit, utility, business and university representatives to recommend strategies for greening the city. The Green Team’s report included a specific recommendation to work with the **Wisconsin Apollo Alliance** to create an “energy technology cluster” for the city. This cluster would bring together Milwaukee’s many energy technology companies with local workforce development agencies to “ensure that Milwaukee has a well-trained workforce that can support the green economy” and help to “locate job opportunities in the communities in most need of expanded opportunities.”

For more information

- Bill Holland, Midwest Regional Field Director
- Apollo Alliance
- holland@apolloalliance.org

Building a Workforce for the Clean Energy Future

1 Job Training Standards cont...

Job Training and Weatherization Assistance Programs

The federal government allocates millions of dollars each year through its Weatherization Assistance Program. This money flows to state agencies which then disburse the funds to local community action agencies, who actually perform the energy retrofits. This outlay of public money provides an opportunity to incorporate job training opportunities for community members. By doing so, cities can reap dual gains—both a more efficiency building stock and also helping community members access the construction industry.

What Communities are Doing Now

In 2001, the Inter Tribal Council of Arizona (ITCA) Weatherization Program, which coordinates weatherization work on reservations in the state, gave a grant to the **Cocopah Indian Tribe**, based in **Yuma County, Arizona**, to provide weatherization services to Cocopah families. The ITCA provided on-site technical training to the Tribe, and helped send two tribal crew members to a DOE-sponsored National Weatherization Training Conference. Crew members then contacted a solar screen manufacturer in Yuma, Arizona, to teach the crew how to manufacture these screens on-site, to reduce cooling loads in the reservation's very hot climate near the Sonoran Desert. The Cocopah Tribe ultimately developed the first self-sustaining tribal weatherization program in Arizona—a program that simultaneously reduces energy bills and creates good local jobs on the reservation.

For more information

- Cocopah Indian Tribe
- 928.627.2102
- www.cocopah.com

Building a Workforce for the Clean Energy Future

1 Job Training Standards cont...

Apprenticeship Utilization

Cities and states that are serious about energy efficiency and domestic production of clean energy must have a supply of workers who are well-trained in modern energy technologies. To ensure that this workforce is well-qualified and paid family-supporting wages, cities should add requirements or incentives for employing workers trained through state-approved apprenticeship programs to any energy legislation. To date, these requirements have been most successfully integrated into Project Labor Agreements (PLAs), or the agreements between units of government and contractors carrying out publicly funded projects. For example, PLAs can require contractors to use apprentices for a specified percentage of all hours worked.

State-approved apprenticeship programs tie together economic and workforce development, and offer benefits directly to the community, existing workers and employers. Existing workers utilize the programs to update and broaden their skills in technologies necessary for new positions in expanding fields. For new workers coming from a variety of backgrounds, apprenticeship programs offer training for and placements into good, family-supporting jobs. Employers and emerging industries rely on apprenticeships programs to provide a reliable supply of workers skilled in the latest industry technologies.

What Cities are Doing Now

Located in **Oakland, California**, The Cypress Mandela Pre-Apprenticeship Training Program was initiated in 1993 to provide local residents with training and employment opportunities in repairing damaged freeways (resulting from the 1989 Loma Prieta earthquake). The Women in Skilled Trades (WIST) Program began in 1988 as a means of preparing women to enter the male-dominated construction industry. Today, the two programs work together to train men and women to enter the skilled trades and other occupations with employers across the San Francisco Bay Area.

This free pre-apprenticeship program, endorsed by the Building and Construction Trades Council, offers classroom instruction and on-the-job experience in construction-related jobs including electrical work, hazardous materials training, and construction. The program works in conjunction with a number of public agencies, including the city of Oakland, the California Department of Transportation, the Environmental Protection Agency, and the United States Department of Labor. Instructors from the Building Trades unions and local colleges ensure that curriculum and training is relevant to current industry needs. The Cypress Mandela/WIST program channels well-prepared graduates to jobs in Building Trades such as Carpenters, Ironworkers, Glaziers, Laborers, and Electricians.

For more information

- Art Shanks, Project Director
- Cypress WIST
- 510.768.4473
- artshanks@yahoo.com

Building a Workforce for the Clean Energy Future

1 Job Training Standards cont...

Solar energy plays a dual role at the IBEW-NECA Technical Institute in **Alsip, Illinois**. This vocational high school has introduced a photovoltaic system that will provide both electricity to the school and education for the students. The solar powered system will generate 5 kW of energy. Students will also benefit from the system by learning about the latest technology in photovoltaics. As a school that educates future electricians, solar energy is quickly coming to the forefront of their energy studies, where standard electrical training is being supplemented by the latest in solar advances. The project was partially funded by the Illinois Department of Commerce and Community Affairs, which chipped in \$19,188, while the International Brotherhood of Electrical Workers Local 134 and the Electrical Contractors Association also contributed their services.

For more information

- IBEW-NECA Technical Institute
- 708.389.1340
- info@in-techonline.org
- <http://www.in-techonline.org/home.cfm>

Policy link

- The Center for Policy Alternatives model apprenticeship utilization requirement legislation:
www.stateaction.org/issues/legislation.cfm?issue=HighRoad.xml

Building a Workforce for the Clean Energy Future

2 Job Quality Standards

Job Quality Standards most commonly take two forms: wage standards and mandates for employer-provided healthcare. Other job quality issues that can be addressed include requirements that new jobs created by the business be permanent and full-time jobs, that new jobs offer opportunities for training and career advancement, that workers be allowed sick leave and/or paid vacation, and/or that a percentage of the new jobs go to “local hire,” meaning that they given to local residents.

Under wage standards, employers must pay the going market rate to employees. The rate can be tied to the state or regional median or average wage, or to the prevailing wage in a particular geographical area and industry.

Employer-provided benefit standards can require businesses to provide health benefits to employees, to pay for a specific percentage (50–80 percent) of employees’ health care costs, or require that businesses either meet the wage standards discussed above, or provide health benefits

Studies show public projects in states with such laws save taxpayer dollars.³¹ In contrast, contractors in states with no prevailing wage laws tend to hire inexperienced workers in an attempt to keep down payroll costs. However, occupational injuries soar on these projects and the use of low-wage workers routinely results in increased supervision, maintenance and cost overruns.

What Cities are Doing Now

The city of **Eau Claire, Wisconsin** has a prevailing wage ordinance to preserve local area wages and labor standards by requiring contractors engaged in publicly funded construction projects to pay construction workers wages that are at least comparable to those earned for similar work in the same county. The ordinance applies to all building or construction work that is financed in whole or in part with city financial assistance.

For more information

- Mike Schatz, Director of City Development
- 715.839.4914
- mike.schatz@ci.eau-claire.wi.us
- <http://www.eauclaireddevelopment.com/PrevailingWage.pdf>

Milwaukee, Wisconsin recently incorporated job quality standards into a downtown development deal. When two freeway ramps were torn down on the northern side of downtown Milwaukee, city activists and unions formed a coalition to ensure that any new development incorporate transit access, good jobs, and environmental benefits. The Good Jobs and Livable Neighborhoods Coalition and the city of Milwaukee ultimately signed a Community Benefits Agreement (CBA) that conditions the sale of city land freed up by the freeway demolition on a number of community benefits. Important job quality features of this CBA include:

- Prevailing wage for construction-phase jobs,
- 25 percent of construction-phase jobs in minority- or women-owned firms,
- 25 percent of construction employees to be minorities or women,
- Living wage or market wage (whichever is higher), plus benefits, for post-construction jobs,
- Local hire and training provisions, including first-source hiring,

For more information

- Bob Dennik, Director
- Milwaukee County Economic Development Division
- 414.278.4083
- RDennik@milwcnty.com

Policy link

- Information on the Park East CBA, including the final legislative language, can be found on the Institute for Wisconsin’s Future website: <http://www.wisconsinfuture.org/workingfamilies/econdev/index.htm>.
- For more information on the links between TODs and jobs, see Sarah Grady and Greg LeRoy, Making the Connection: Transit Oriented Development and Jobs (Good Jobs First, 2006), available at <http://www.goodjobsfirst.org/pdf/makingtheconnection.pdf>.

Building a Workforce for the Clean Energy Future

3 Best Value Contracting

Best Value Contracting (BVC), also known as “negotiated contracting” and “competitive sealed proposal contracting,” is a procurement method that provides an alternative to the traditional lowest-bid method of contracting. As a competitive contracting process increasingly used in the public sector, BVC requires contracts to be awarded to the contractor offering the best combination of price and qualifications, including the use of skilled, high-quality workers, past performance, and the ability to complete projects in a safe, timely, and cost-effective manner.

In addition to the potential benefits of BVC for labor, including contractor participation in registered apprenticeship programs, on-job safety and health programs, and the sufficiency/reliability of craft labor supply sources and project staffing plans, BVC can also be used to promote environmentally sustainable development. To this end, environmental groups can push to have such criteria as past environmental performance of the bidder, plans for protection of flora/fauna and construction/demolition of waste disposal, contractor certification in LEED construction, contractor/subcontractor experience with green building design and construction, a work scheduling plan, including environmental impact on existing tenants, and the ability to host training programs on energy saving for facilities managers and janitors, included in the criteria for awarding contracts.

What Cities are Doing Now

In 2002, the city of **Portland, Oregon** used a version of Best Value Contracting to screen contractors for two major affordable housing projects. In the RFPs for these projects, the city assigned 25 points out of a possible 100 points to “Green Design.” The normally dominant categories of “Market Potential” and “Team Qualifications” were assigned only ten and 20 points, respectively.

For more information

- Dan Saltzman, Commissioner
- Office of Sustainable Development
- Green Building Division
- 503.823.7725
- <http://www.green-rated.org/>

Policy link

- RFP for 2002 “Innovations in Affordable Housing:” http://www.aia.org/SiteObjects/files/RFP-Portland_OR_affordable_housing_grants.pdf

About the Apollo Alliance

The Apollo Alliance for Good Jobs and Clean Energy

The Apollo Alliance aims to improve America's security, technological leadership, economic strength, and shared prosperity by achieving sustainable American energy independence through efforts at the national, state and local level. Named after President Kennedy's challenge in the 1960s to land a man on the moon within a decade, our new Apollo Alliance has a bold strategy to direct \$300 billion in targeted investments towards achieving sustainable energy independence within a decade. Our plan is supported by key national leaders in the labor, environmental, and business sectors, as well as by communities of color who are traditionally most harmed by existing energy policies.

Some of Apollo's most exciting work takes place at the state and local level, where we bring together labor, environmentalists, business, civil rights activists, elected officials and their constituents to implement high-performance policies. These state and local Apollo groups work on specific job-generating policies and projects to increase energy efficiency and renewable energy use, and build the transportation, utility, and other infrastructure needed to support sustainable efficient energy practice. Over the past two years, state and local Apollo Alliances have been built in cities from Los Angeles to New York and states from Hawaii to Massachusetts. These state and local alliances pursue specific legislative and administrative reforms to increase investment in energy efficiency, renewable power, and other clean energy strategies.

Investment at all levels of our economy creates high quality jobs and increased income, as well as improving the environment and public health. It also more than pays for itself, offering fiscally strapped states, cities, and for-profit investors a better than competitive real rate of return (often as high as 15–20 percent annually). To learn more about how your city can start an Apollo project, and to find information on existing coalitions and projects, visit our State and Local Apollo Strategy Center at http://www.apolloalliance.org/state_and_local/ or contact one of the Apollo Alliance regional organizers.

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1. David Owen, "Why New York is the Greenest City in the U.S." *New Yorker* (October 18, 2004).
2. Combined Heat and Power Association. "How does CHPO work?" available at www.chpa.co.uk/aboutchp.htm (accessed September 22, 2005).
3. National Renewable Energy Laboratory. "Combined Heat and Power: Waste Heat Recycling: Onsite and National Energy Impact Analysis" available at www.nrel.gov/dtet/heat_power.html (last update July 8, 2005); see also United States Combined Heat and Power Association, "CHP BASICS," available at uschpa.admgt.com/CHPbasics.htm (last access April 30, 2006).
4. "US DOE, 2004 Buildings Energy Databook," available at buildingsdatabook.eren.doe.gov/ (last update Jan. 6, 2006).
5. "US DOE National Energy Policy Report" (May 2001), available at <http://www.whitehouse.gov/energy/National-Energy-Policy.pdf>.
6. For a discussion of potential jobs created through energy efficiency projects see: http://www.apolloalliance.org/about_the_alliance/benefits_of_apollo_s_plan/examples.cfm.
7. U.S. Department of Energy, Energy Efficiency and Renewable Energy, Federal Energy Management Program, "The Business Case for Sustainable Design in Federal Facilities" (August 2003), available at www.eere.energy.gov/femp/pdfs/bcsddoc.pdf.
8. Id.
9. Greg Kats, "The Costs and Financial Benefits of Green Buildings: A Report to California's Sustainable Building Task Force" (Capital E: October 2003), available at www.cap-e.com/ewebeditpro/items/059F3259.pdf.
10. Id.
11. Apollo Alliance, "New Energy for America—The Apollo Jobs Report: Good Jobs and Energy Independence" (Jan. 2004), available at www.apolloalliance.org/jobs/index.cfm.
12. Energy Star's purchasing and procurement policies are available on the Energy Star website, at www.energystar.gov/index.cfm?c=bulk_purchasing.bus_purchasing (last viewed April 30, 2006).
13. National Pollution Prevention Roundtable, "Environmentally Preferable Purchasing," available at www.p2.org/workgroup/epp/ (last viewed April 30, 2006).
14. State University of New York at Buffalo—UB Green, "Campus Energy Policies," available at wings.buffalo.edu/ubgreen/content/programs/energyconservation/energypolicies.html (last viewed April 30, 2006).
15. Green Home NYC, "Lessons from Green Universities" (March 16, 2005), available at www.greenhomenyc.org/page/forum0503.
16. Learn more about Austin Energy's programs at www.austinenergy.com.
17. Andrew Aulisi and Craig Hanson, "Developing 'Next Generation' Green Power Products for Corporate Markets in North America" (World Resources Institute: Dec. 2004), available at <http://www.thegreenpowergroup.org/pdf/Installment6.pdf>.
18. American Council for an Energy Efficient Economy, "A Federal System Benefits Fund: Assisting States to Establish Energy Efficiency and Other System Benefit Programs" available at: <http://www.aceee.org/energy/pbf.htm> (last viewed April 30, 2006).
19. Apollo Alliance, "Energy Independence: the Facts," available at http://www.apolloalliance.org/strategy_center/reports_and_resources/independenefacts.cfm (last viewed May 20, 2006).
20. As plug-in hybrid vehicle technology matures, cities—possibly in partnership with local utilities—should also play a leading role in helping their residents build the electric infrastructure needed for these vehicles.
21. Lesley Rogers Barrett, "Metro Area gets Another E85 Pump," *Indianapolis Star* (May 9, 2006).
22. Hamilton County Solid Waste County Management District. Minutes of 'Policy Committee Meeting', November 11th, 2005. Available at www.hcdoes.org/sw/Policy/01122006/111005minutes.pdf.

Endnotes

23. Patrick Mazza, "Powering the Smart Grid: A Northwest Initiative for Job Creation, Energy Security and Clean, Affordable Electricity" (Climate Solutions: July 2005), available at <http://www.climatesolutions.org/pubs/pdfs/PoweringtheSmartGrid.pdf>.
24. SustainableBusiness.com, "Climate Neutral Bonds: A Local Global Warming Solution" (Feb. 2006), available at http://www.sustainablebusiness.com/features/feature_template.cfm?ID=1305 (last viewed April 30, 2006).
25. John Bailey, "Climate Neutral Bonding: Building Global Warming Solutions at the State and Local Level" (February 2006), available at <http://www.newrules.org/de/climateneutralbonding.pdf>.
26. Apollo Alliance, "Energy Service Companies (ESCOs) and Energy Savings Performance Contracts (ESPCs)," available at www.apolloalliance.org/strategy_center/model_financing_strategies/espcs.cfm (last viewed April 30, 2006).
27. National Association of Energy Service Companies, "New Report Documents \$2 Billion Annual Investment in Energy Efficiency by ESCOs" (May 2002), available at www.naesco.org/industry/press020530.htm.
28. Id.
29. National Association of Energy Service Companies, "What is an ESCO?" available at www.naesco.org/about/esco.htm (last viewed April 30, 2006).
30. For a very comprehensive paper on the range of job quality standards that exist in the US today, see Anna Purinton, "The Policy Shift to Good Jobs" (Good Jobs First: 2003), available at www.goodjobsfirst.org.
31. Dan Gardner, "The Truth about Prevailing Wage," available at www.boli.state.or.us/BOLI/WHDPWR/docs/pwrtruth.pdf (last viewed April 30, 2006); see also Dale Belman and Paula B. Voos, "Prevailing Wage Laws in Construction: The Cost of Repeal to Wisconsin," (UW-Milwaukee: Oct. 1995).