

Coal Plants and the Wealth of Cities

What Texas Cities Can Do To Stop Coal Plants and Global Warming



Texas cities are threatened by air pollution, skyrocketing electric costs, and climate change. Texas currently burns 10% of all the coal in the U.S. This results in 1,310 premature deaths, 32,000 asthma attacks, and 274,000 lost work days annually. Fifteen *new* coal plants proposed for Texas would increase the death toll by 4,147 people over a 30-year period, with \$25 billion in damages from shorter lifetimes.

Cities in non-attainment of federal air safety standards will be hurt as their economic development is restricted. Large metropolitan regions including Dallas/Ft. Worth and Houston may face elimination of federal highway funds as sanctions for non-compliance. These sanctions would result in as much as \$587 billion in losses to the state's economy and a 2.8 million loss in jobs in a 10-year period. Avoiding sanctions will require expensive remediation. New coal plants will add to the remediation costs.

These new coal plants will cost at least \$16 billion plus interest! Operating them over their 30-year life will cost an additional \$40 billion. This is almost \$7,000 for every household in Texas. This locks up investment capital that Texas needs to create in-state jobs with clean energy technologies that protect the environment.

Climate change threatens Texas with torrential rains, devastating droughts and crop losses, hotter summers and higher energy costs, eroding coastlines, and in-migration of tropical diseases. Coal creates more carbon emissions than any other conventional fuel. If Texas were a separate country, it would rank 7th in the world for carbon emissions, and a primary reason is its existing coal plants. *New coal plants will increase the carbon Texas emits from coal by almost 50%.*

If Texans have a mind to, they can solve these problems. *And our cities play a vital role.* Our state's home rule cities do not have to wait for a state plan. They can launch a set of clean energy initiatives that can improve air quality and mitigate global warming. And they can create jobs in the process by installing clean energy solutions and preventing energy dollars from leaving the local economy.

Six strategies Texas cities can employ include:

- 1) Energy-efficiency retrofits in existing buildings;
- 2) Energy-efficiency on new building codes;
- 3) Energy-efficiency mandates for rental buildings;
- 4) Urban heat island mitigation with light-colored roofs, streets, and shade trees;
- 5) Combined Heat & Power utilities;
- 6) Green power purchasing and marketing.

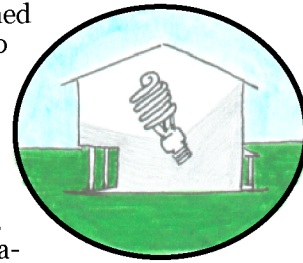
Energy Efficiency Programs & Texas Cities

Energy efficiency retrofits of buildings, appliances, and equipment are usually cheaper than the cost of any new power source, and do not create environmental problems. The potential for savings is huge: as much as 75% in lighting; 50-75% in heating and air conditioning. A report by the American Council for an Energy Efficient Economy (last page) states that efficiency can defer most of the state's projected electric load growth over the next 15 years.

Implementing energy efficiency on a regional level has been pursued by some utilities since the 1970s. But with exceptions, programs in Texas have not been very aggressive. Programs in other states such as Vermont and California receive up to 12 times more funding per person. Efficiency advocates hope that state officials will increase funding. But cities do not have to wait for the state to act.

The City of Austin's municipal utility spent 2% of its gross electric revenues on efficiency programs in 2005. Austin

also requires the privately owned natural gas utility in the region to fund efficiency programs. This is mandated in the company's franchise, and budgets are adjusted on a yearly basis. In 2008, about \$1.3 million will be spent on these programs, which are the only gas conservation programs in Texas. Cities do not need to wait for franchise renewals; more aggressive conservation can also be funded through rate cases.



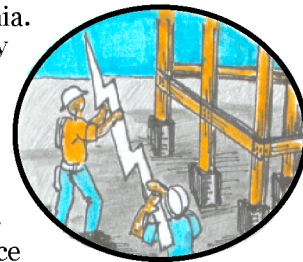
Vermont tops the nation in efficiency investment. In 2008, it will spend 5% of electric revenue on efficiency programs. And unlike most other places, the programs are administered by an "efficiency utility" that is not owned or directly associated with electric utilities. In a similar vein, Texas cities can consider using new-found efficiency money to fund their own independent programs. These programs will create thousands of jobs while saving consumers money.

Energy-Efficient Building Codes

While energy efficiency retrofits are cheaper than a new power plant, a building employing efficient construction from the start is even less expensive. New homes with radiant-barrier roofs, ductwork on the inside of buildings, better heat-reflecting windows, and less air leakage can save 30% compared with the existing building code and 65% compared to older homes. New commercial buildings can save 50% and more using techniques and equipment such as natural daylighting, efficient lighting and cooling, better heat-reflective glass and insulation, and controls to turn off air conditioning and lighting when not in use.

In 2006, the U.S. Conference of Mayors adopted a position that by the year 2030 all new buildings will incorporate energy efficiency and renewable energy to the point that they will not use any fossil fuel. But some cities are already on their way there. Frisco, TX has mandatory requirements for green building, as do Boulder and Aspen, CO, and

several small cities in California. Boston has become the first city in the country to mandate green building standards in large commercial buildings.



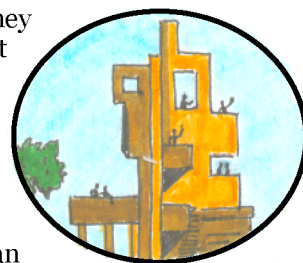
The City of Austin's Green Building Program uses a voluntary approach of design assistance to help builders achieve results that are better than the current code. Every building participating in the program is rated for energy use, water use, building materials, and waste management. Higher ratings are used to market buildings to buyers and renters and to attain a positive public image. Some of the energy measures promoted in the program are eventually made part of the building code as builders and buyers become more accustomed to them. Other local governments that offer design assistance include Portland, OR, and San Jose and San Francisco, CA.

Mandatory Retrofits in Rental Buildings

Nationally, some 34% of residential dwellings and 44% of commercial buildings are rental properties. In some major urban areas in Texas, such as Dallas and Austin, almost half of all residences are rentals. Landlords are reluctant to upgrade buildings for energy efficiency because they commonly do not pay the utility bill, and tenants do not want to pay for the upgrade because they do not own the structures. In the case of rental buildings, the invisible hand of the market has vanished.

The state of Wisconsin has had a law in effect since 1985 requiring the upgrade of rented single family and multi-family dwellings with energy efficiency measures at the time they are sold. The law requires minimum levels of insulation, weatherstripping, and storm windows. In 2005, the state oversaw the efficiency certification of 6,000 buildings. Residential upgrade requirements also exist in the California cities of San Francisco, Berkeley, and Davis. In Berkeley, CA, a similar rule requires the upgrade of com-

mercial buildings at the time they are sold or remodeled with about 30 measures, including duct sealing and efficient lighting. About 30 buildings were upgraded through this program in 2006.



The 27 countries in the European Union have started a program for mandatory energy ratings called Energy Performance Certification. Almost all new buildings, buildings accessible to the public, and commercial and residential rental buildings must undergo an energy audit to rate their predicted consumption. Buildings are rated for both energy use and carbon dioxide emissions, and the ratings are either displayed in public or available to prospective tenants. The program uses market forces to motivate owners to upgrade structures. And commercial buildings above 1,000 square meters must be retrofitted with all cost-effective measures.

Cooling the Urban Heat Island

Cities are much hotter than the surrounding countryside due to the retention of the sun's heat in streets and buildings. The Environmental Protection Agency has found that Houston temperatures on roofs and roads can be 149° F, compared to 77° F in cooler areas of the city. This results in an average air temperature rise of 3° F regionwide and limits natural cooling at night.

Heat retention is compounded by the removal of trees and shrubs that provide shade. This widely recognized phenomenon is called the *heat island effect*. It drives the need for air conditioners and the energy to run them. And the added heat contributes to smog formation on hot days.

A few places in the country are beginning to take action.

- Georgia requires all new roofs and roof replacements to use heat-rejecting materials or have adequate insulation. California requires low-sloped roofs to have a certain

Combined Heat & Power

Energy does not need to be produced in large centralized plants hundreds of miles from its customers. Combined heat and power (CHP) generates power on site and uses the waste heat for space heating, hot water, absorption cooling and refrigeration, and industrial process heat. Large, centralized heating and cooling plants, known as district heating and cooling, provide space and water temperature control to clusters of buildings through underground pipes.

About 8% of the building space in the U.S. is served by CHP and district heating and cooling. Distributed generation using CHP saves up to 60% of the energy per square foot and reduces need for equipment, labor, and maintenance.

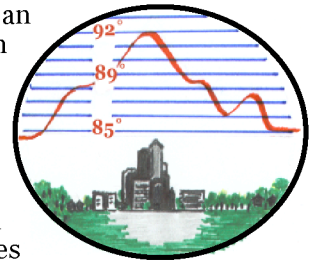
Large systems exist in at least 60 American cities. The largest, in New York City, generates 839 Megawatts of electricity while providing heat for 1,800 buildings. Other cities with large systems include Baltimore, Detroit, Los Angeles, Milwaukee, Minneapolis, Philadelphia, Seattle, St. Louis,

Cities & Green Power

Local governments are prodigious users of electric power. Water service alone uses more than 2% of all the electricity in the country. Building loads and street lighting use even more. Electricity from renewable energy, including wind power, biomass (biogas from landfills and wood waste), and solar energy can be purchased by local governments both to create demand for clean energy and to stabilize costs for municipal operations. In the near future, geothermal power from Texas oil wells may also be available.

The City of Houston is pursuing bids for green power for up to 25% of its needs, and is applying for low-interest federal bonds to build its own wind facility to get even more. The City of Dallas now gets 40% of its electricity from wind. In 2009, the City of Austin will become the first major city in the country to purchase green power for 100% of its needs. School districts in Austin and Round Rock get 30% of their electricity from renewables, while Portland, OR, is planning for 100% of its electricity from green energy.

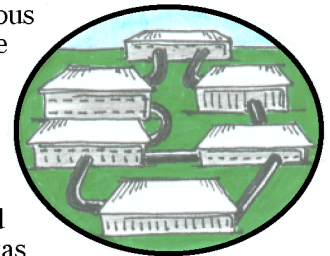
reflectance and emittance for an annual savings of \$107 million in energy and equipment. In Chicago, low-sloped roofs must also have a minimum heat rejection rate.



- In Houston, \$23 million in federal funds will plant trees near highways. The Sacramento Municipal Utility District paid for the planting of 21,000 trees in 2004. The budget (currently about \$1.5 million) is cost-justified through electric utility savings. Since its program began in 1990, the utility has planted 350,000 trees. Los Angeles requires trees in its building code: one tree for every 25 feet of wall exposure.

- Cities in North Central Texas, including Ft. Worth, Grand Prairie, McKinney, and Wichita Falls, have preferences for concrete streets. Reasons include aesthetics, lower maintenance, better reflectance and durability in clay soils.

St. Paul, and Trenton. Numerous universities in the U.S. operate these CHP systems, including eight in Texas.



CHP is used extensively in Texas industry. But industrial potential is not exhausted, and CHP use in commercial Texas buildings is barely tapped. Buildings particularly suited for distributed generation include hospitals, hotels, and schools and office campuses. Texas has about 3,800 Megawatts of CHP potential in the near future enough to displace 6 proposed coal plants.

Cities can take the lead with low-cost funding, operating CHP and district systems as a new revenue source. They can also encourage them in new developments. Building complexes of local governments can also employ these strategies to lower their own energy and maintenance costs.

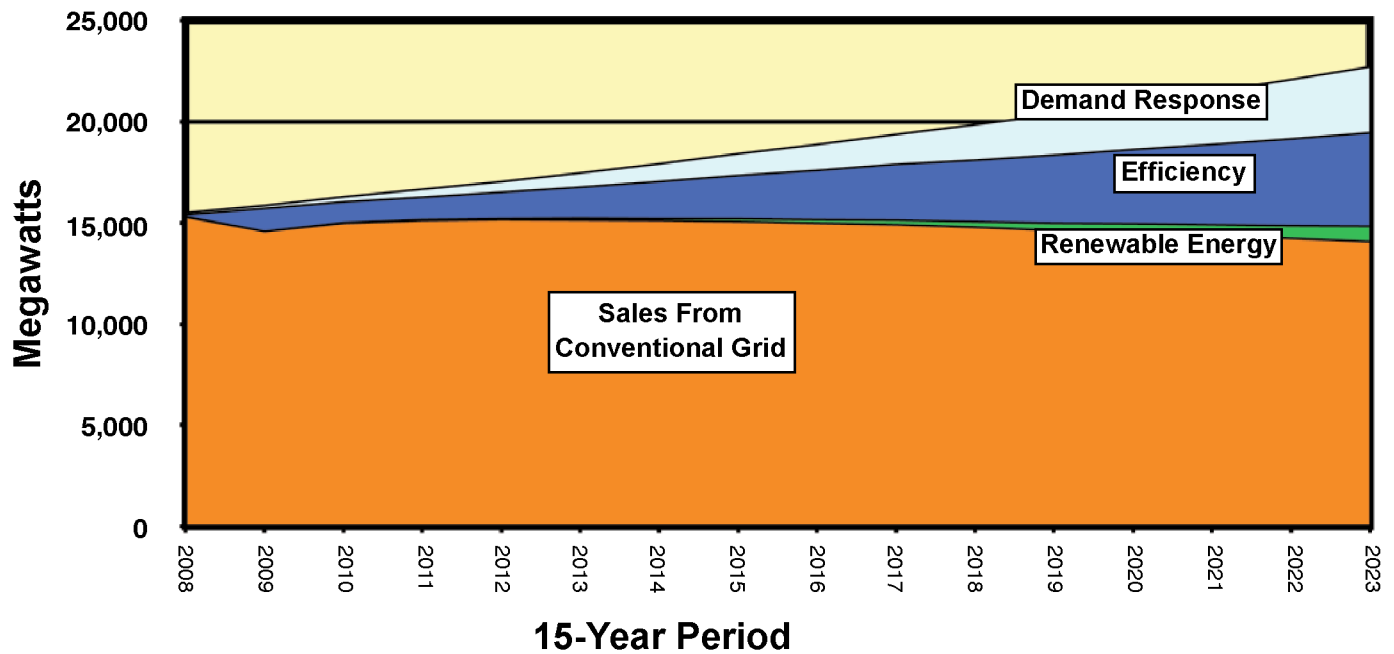
Some governments are banding together to make volume purchases of green power to lower the cost. Successful efforts at "power aggregation" were accomplished in New York state, where 56 cities collaborated to purchase wind power.



In Montgomery County, MD, 16 local government agencies combined to purchase green power, and this effort became part of the region's plan to comply with federal air quality laws.

Another strategy to foster green power is for local governments to aggregate it for their citizens. The Cape Light Compact is a purchasing consortium comprising 23 local governments in Massachusetts representing about 200,000 electric customers. The compact buys both conventional and green power at a volume discount. About 11 local governments in California are considering this idea, including the City of San Francisco and Los Angeles County.

A Comprehensive Clean Energy Plan for Dallas/Ft. Worth



The graph above is from a recent report by the American Council for an Energy Efficient Economy. It shows the effects of energy efficiency and new building codes, peak shaving from Demand Response, and renewable energy on the electric demand of the Dallas/Ft. Worth area. The region can meet projected electric demand while maintaining population and economic growth without new power plants.

Texas cities don't have to wait for the state or federal government to act on these clean energy strategies. They can show their independence and self-reliance by starting the shift to clean energy now. And they can do this while reducing pollution and increasing economic growth.

Read more about this clean energy plan for Dallas/Ft. Worth at www.aceee.org/pubs/eo78.htm.

For more information on energy efficiency and building codes, contact the American Council for an Energy Efficient Economy at www.aceee.org. For more information on the greenbuilding code in Frisco, TX, contact www.ci.frisco.tx.us.

For more information about what can be done to mitigate heat islands in cities, contact the Environmental Protection Agency's Heat Island Reduction Initiative at www.epa.gov/heatisland. For more information about the heat island mitigation program for Houston, contact the Houston Advanced Research Center at www.harc.edu/Projects/CoolHouston.

For more information on Combined Heat & Power and district heating and cooling, contact the International District Heating and Cooling Association at www.districtenergy.org. For more information on CHP potential in Texas, contact the Gulf Coast CHP Application Center at www.gulfcoastchp.org.

For more information on Green Power programs throughout the U.S., contact the Environmental Protection Agency's Green Power Partnership at www.epa.gov/greenpower.



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