



DISTRICT OF COLUMBIA
ENERGY OFFICE

COMPREHENSIVE ENERGY PLAN

2003-2007



**Collaboration
& Security**



**Innovation
& Efficiency**



**Affordable
& Available**



GOVERNMENT OF THE
DISTRICT OF COLUMBIA
Anthony A. Williams, Mayor

COMPREHENSIVE ENERGY PLAN

2003 - 2007



*DISTRICT OF COLUMBIA
ENERGY OFFICE*
Chuck Clinton, Director



**GOVERNMENT OF THE
DISTRICT OF COLUMBIA**
Anthony A. Williams, Mayor

“Making D.C. Energy Efficient”

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MAYOR'S STATEMENT



Dear Fellow Citizen:

As much now as ever, all of us in the District of Columbia need to recommit our efforts to using energy wisely. Collectively, residents, employees, businesses, organizations, visitors and government spend more than \$1.3 billion a year on energy, with the District Government comprising almost 4% of that amount. Working together, we can influence how much energy we consume, thereby improving our air quality, our comfort, and yes - our pocketbooks.

With redoubled efforts, it is possible to slow the rate at which our energy consumption grows while population, housing, commercial space, employment, production of goods and services, and number of visitors expand. In addition, money that would have been spent on energy can stay in the local economy. Furthermore, the more energy efficient we are as a city the more secure we will become, since we can better buffer the swings in global energy politics and markets.

Still, there may come times when we face an energy supply or other emergency. We can enhance our energy security by developing contingency plans and the capacity to implement those plans when needed.

This District of Columbia Comprehensive Energy Plan outlines steps the city can take to become more energy efficient, while at the same time providing for a more secure tomorrow. It presents actions for everyone - the young and not so young, private businesses and government agencies, apartment dwellers and homeowners - and offers a guidepost toward a bright energy tomorrow.

Come join me on that path as we become One City, One Future.

Sincerely,

A handwritten signature in black ink that reads "Anthony A. Williams".

Anthony A. Williams
Mayor

COUNCILMEMBER STATEMENT



Phil Mendelson
Councilmember-At-Large

COUNCIL OF THE DISTRICT OF COLUMBIA
WASHINGTON, D.C. 20001

Office: (202) 724-8064

Fax: (202) 724-8099

October 15, 2002

Dear Citizen,

I am very pleased with this third Comprehensive Energy Plan, or CEP. It contains many excellent recommendations for every energy consumer in the District of Columbia.

Through my work on the committee overseeing the District of Columbia Energy Office I worked to promote and fund the creation of a new Comprehensive Energy Plan. I did this because we know that greater energy efficiency results in a cleaner city, better air quality, and lower energy bills for everyone in the District of Columbia.

Each year over \$1 billion is spent on energy in the District. The 43 recommendations contained in the CEP can help reduce costs to the government, business and industrial sectors, as well as to individual residents. Implementation of prior energy plans has resulted in millions of dollars in energy savings over the last fifteen years.

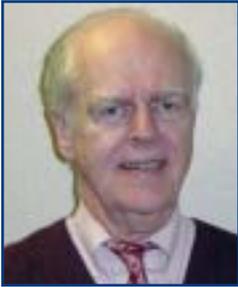
I will continue to do what I can to promote the creation and implementation of sound energy policies across the DC Metro area. The District of Columbia's third Comprehensive Energy Plan is a significant step toward achieving greater energy efficiency. I look forward to working with the Mayor and my colleagues on the Council to implement its recommendations in the years to come.

Sincerely,

A handwritten signature in blue ink that reads "Phil Mendelson".

Phil Mendelson
Councilmember At-Large

DIRECTOR'S STATEMENT



Nearly all the energy used in the District of Columbia comes from outside our boundaries. Because we are so dependent on imported energy, we are also subject to demand/supply pressures and cost realities that influence the availability and price of energy.

Recent US Department of Energy data reveal that the District spent \$1.3 billion on energy in 1999. The non-independent agencies of the DC Government alone spend approximately \$55 million each year to purchase the energy required to operate. Households in the District spend an average of \$1,180 per year on energy for residential uses, and the amount expended on gasoline each year in the District is \$213 million.

As much as 85% of the money spent on energy leaves the District's economy. This outflow is dramatic, but it is something that can be slowed down. We can become more energy independent, and we have the resources to make the District more energy efficient.

In general, this Comprehensive Energy Plan indicates that we need to use non-renewable energy more efficiently, use renewable resources more aggressively, and ensure that the appropriate legislative, administrative and regulatory mechanisms are in place to support wiser use of energy in the city. The Plan also acknowledges that in the District of Columbia, according to the 2000 census, approximately 52,000 households, or 23% of the total, are at or below the poverty level. Special efforts must continue to assist these citizens in keeping up with the cost of energy, at least until their homes can be made energy efficient and they become energy-smart consumers.

The Plan is comprehensive. It proposes 43 interconnected and mutually supportive measures in many different areas of our lives - where we live, work and play, and how we get from one place to another. In order for the Plan to be successfully implemented, collaborative efforts must be made by the DC Government, energy suppliers, regulatory officials, and, most importantly, by the citizens of the District.

The 43 recommendations contained in this document are attainable. This Plan is not an exercise in zero-based planning, nor a peek into a utopia of the future. It is, instead, a set of incremental measures that can be implemented in addition to current DC energy initiatives aimed at energy efficiency. The Plan recognizes, and to some extent codifies for the benefit of the reader, many local and federal laws, regulations and policy statements on energy that are already in place. This document builds on that foundation and has been written in the context of the policy framework already in place. Taking the steps outlined in this Plan, together we can make great strides toward making the District of Columbia energy efficient.

All the best,

A handwritten signature in black ink that reads "Chuck Clinton". The signature is written in a cursive, flowing style.

Charles J. Clinton
Director

EXECUTIVE SUMMARY

In a society that values productivity and conservation of limited resources, energy efficiency is a major factor in building and sustaining healthy neighborhoods, promoting economic development, making government work and enhancing the unity and purpose of our way of life. This Comprehensive Energy Plan is designed to guide the District of Columbia toward developing sound energy practices, protecting energy security and preserving the natural environment.

Much has been achieved during the twenty-five years that the DC Energy Office began helping citizens focus their attention on energy. Economic indicators point toward significant achievement in maintaining energy efficiency in the District:

- DC produced more goods and services with decreasing energy
- DC employed more workers with declining per-employee energy cost
- DC's overall energy expenditures remained relatively flat for the last ten years
- DC's total energy expenditures increased less than the rate of inflation.

In other words, the District of Columbia has been able to expand the rate of increase in housing, employment, and output faster than it has expanded its use in energy. But at the same time that the District experienced a period of economic prosperity and increasing gross domestic product, it has also faced the challenge of regionalization as some of its population shifted from the city to surrounding jurisdictions. The combined impact of suburban and city energy consumption continues to affect the cost and availability of finite energy resources and influences our lives and our environment, especially the air we breathe. The region continues to be a non-attainment area for ozone and related pollution, and gasoline and diesel use and its attendant consequences will continue to challenge the District as traffic congestion hampers commuters, visitors and residents alike. Residential demand will be challenged by competitive sales for electricity and natural gas, a projected increase in population and the needs of lower income consumers. The demand for energy in the commercial and institutional sectors will grow as more companies and organizations expand or locate to the District.

This suggests that the District must continue to improve energy efficiency in order to handle the potential expansion of energy consumption and to improve environmental quality. It can do this through actions taken inside the city as well as in cooperation with neighboring jurisdictions. Furthermore, the District is no less vulnerable than others to petroleum fuel problems caused by

political instability outside of the United States. The continued efficient use of energy is relatively inexpensive protection against energy security problems.

The principal goal of this Comprehensive Energy Plan, then, is to guide the District Government, and equally important, its citizens, in meeting its energy challenges over the next five years and beyond, thus helping the District maintain and ensure its ability to provide a dynamic and desirable environment in which to live and work. As an aid in providing such guidance, this Plan suggests three major energy themes with attendant sub-themes. These themes and sub-themes guide the distribution of recommendations among various energy-consuming sectors. They also point to the relationships among sectors, as many of the recommendations affect energy consumption on more than one level.

The theme "Increasing Energy Efficiency and Innovation" focuses on reducing energy consumption, while "Enhancing Energy Availability and Affordability" concentrates on reducing the effects of the rising costs of energy. Lastly, the theme "Promoting Energy Collaboration and Security" deals with developing productive partnerships that will help the city continue to become energy efficient and create a framework for preparing and responding to energy emergencies.

The Recommendations

Forty-three recommendations form the core of this Plan. There are 21 recommendations that address the major energy end-use sectors - DC Government, Residential, Commercial/Industrial, Institutional and Transportation. The Plan also identifies 22 recommendations that address several special strategies - Energy Assistance, Public Information/Education, Regulatory Intervention, Research and Development, and Emergency Planning. The following is a brief overview of the recommendations.

DC Government Sector: The District Government spends approximately \$55 million per year on energy. The recommendations in this sector focus on reducing the energy consumption and costs in DC-owned and leased facilities and implementing at least one innovative energy project per year over the same period. Holding District agencies accountable to clearly stated energy goals, conducting energy audits of District facilities, and easing procurement requirements to allow for performance contracting or other alternative financing mechanisms in order to finance energy efficiency improvements will enable the District to improve its energy management.

Residential Sector: These recommendations focus on expanding the adoption of energy efficiency technologies and practices as a way to reduce the impact of energy costs on household budgets. Expanding energy

awareness, endorsing time-of-sale audits, promoting renewable resources and providing enhanced weatherization for the most vulnerable will improve the outlook for this sector.

Commercial/Industrial Sector: This sector drives energy consumption in the District. Building code enhancements and developing partnerships are two effective ways in which the District Government can guide the use of energy in the city. Thus, the recommendations call for stimulating energy conservation and efficiency through various incentives, conducting awareness campaigns and educational forums, and encouraging owners and operators of commercial buildings to set targets for reducing their energy consumption.

Institutional Sector: The recommendations here are similar to those in the Commercial Sector. It is suggested that we need to identify the major players, create strategic partnerships, and to establish a win-win framework to encourage greater efficiency. Providing matching grants to reduce the costs of adopting energy efficient technologies, implementing a "Green Faith" initiative to assist congregations in ensuring that their facilities operate at peak performance, and collaborating with institutional organizations to facilitate the dissemination of energy efficiency technologies are steps that can be taken to improve energy performance in the Institutional Sector.

Transportation Sector: These recommendations focus on increasing the use of alternative fuels, reducing the number of vehicle miles traveled and improving the flow of traffic. A high degree of cooperation among all sectors of government in the region, and among major employers, is required for success. Less traffic congestion and improved air quality are benefits that can be derived from the enhanced use of mass transit and technological improvements now available for traffic management and intelligent traveler choice.

Energy Assistance: The District is rightly concerned about those least able to help themselves. These recommendations include expanding the ability to serve the eligible population, increasing the number of services to that population, improving on service delivery and educating consumers as to how best to manage their resources.

Public Information/Education: These recommendations concentrate on improving energy information services offered by DCEO, using the latest media to get out the energy message, developing school-based curriculum and programs, implementing an awards program to acknowledge those who are good energy citizens, and providing a showcase for energy-efficient and environment-friendly technologies.

Regulatory Intervention: Regulatory recommendations focus on the DCEO sustaining a presence before the DC Public Service Commission, advocating a regional approach to some regulatory issues, assessing the effects of the

changes in the regulatory environment and in energy markets, and mitigating the influence of energy prices on low-income consumers.

Research and Development: This group of recommendations deals with exploring ways in which DCEO can accelerate the implementation of cutting-edge energy efficiency technologies in the District, assess the effectiveness of these newly adopted technologies, and foster a research and funding environment to promote energy efficiency.

Emergency Planning: These recommendations ensure the development of appropriate response plans, the coordination among affected groups, and an understanding of the interdependencies among public and private sector consumers as well as energy providers.

Toward the Future

No plan would be complete without a discussion of who is responsible for implementing the recommendations. The overlapping roles of DC taxpayers, utility ratepayers, federal grants and energy efficiency cost savings reinforce each other. Performance-based planning and coordination among responsible parties are key behavioral factors required for maintaining energy efficiency. On-going program evaluation will provide feedback and enhance awareness and accountability. Fiscal support for current and future initiatives is recommended. In the regulatory arena alone, funds are needed to allow the Energy Office to continue helping the District Government make the case for the most cost effective rates for electricity and natural gas in a changing utility landscape, advocating initiatives such as Utility Discount Programs, the Reliable Energy Trust Fund and the DC Municipal Aggregation Program, and advancing issues critical to end-users such as deregulation, net metering and distributed generation, thus providing significant cost savings to the government, businesses, and residences. Activities such as the acquisition of alternative fuel vehicles, strengthening building codes, consumer education, municipal building efficiency, technical training, assistance for low-income energy users, and emergency planning will require the support of a variety of stakeholders.

The purpose of any plan is to offer guidance for the future. This Comprehensive Energy Plan is constructed upon the achievements of the District Government, its citizens and workers. The key to its success will be found in the commitment of District leaders, residents, and all those who do business here to place energy efficiency high among their priorities. Energy efficiency and security can be attained through conservation, cooperation and planning. The recommendations in this Plan will guide the District's energy future and lead the city toward becoming more energy efficient, affordable, innovative and - fitting for the Nation's Capital - a model for other jurisdictions to emulate.

CHAPTER I

INTRODUCTION

This Comprehensive Energy Plan represents the next step in the evolution of the District's efforts to become energy efficient. Much has been accomplished so far by the DC Government and in the residential, commercial, institutional and transportation sectors of the economy. The Plan embodies a series of practical, cost-effective actions that can be undertaken over the next five years to further the goals of becoming more energy independent, using energy more efficiently, protecting our energy security, and preserving the environment for generations yet to come.

Shortly before federal legislation was signed that allowed the District of Columbia to adopt a home rule charter, the OPEC oil embargo threw the nation into a new energy era. This was a time of escalating energy prices, changing energy supply sources, the failure of the promise of nuclear power, and an increase in energy-related environmental concerns. In 1975, with the return of limited home rule for the first time in more than a century, the District entered a new political era to go along with the new energy era.

Under the Home Rule Charter, the DC Council enacted legislation, signed into law in January 1981, to establish the DC Energy Office. Although the District Government was already developing state energy plans and helping manage serious petroleum shortages, this legislation (DC Law 3-132) established the DC Energy Office as the statutorily created lead agency on energy plans, policies and programs for the District. It also mandated the development of a Comprehensive Energy Plan (CEP) that would propose measures to conserve energy, favorably impact on the DC budget, improve the local economy, create jobs and help the environment.



CEP Preparation Task Force Consultants celebrate with a horse ride after completing the DC Comprehensive Energy Plan. They compared their exciting experience of creating such a powerful document to the famous Notre Dame Four Horsemen. Left to right are Pedro Alfonso, Don Milsten, Lenmeal Henderson and Jerome Paige.

A CEP preparation task force, composed of four members from DCEO staff plus one member from the center for Applied Research and Urban Policy of the University of the District of Columbia, and one member from the Metropolitan Washington Council of Governments (COG), was established to produce the document.

In January 1987, CEP I, spanning the time frame 1986-

1990, was completed. It represented the efforts of the entire DCEO organization, and was reviewed by many DC Government officials, energy suppliers and members of the Citizen's Energy Advisory Committee.

For the purposes of that Plan, the District was divided into five sectors: DC Government, residential, commercial/industrial, institutional and transportation. In addition, five other categories were created: fuel assistance, education/public information, regulatory intervention, research and development, and contingency plans. A series of 48 practical and cost-effective measures was proposed, the successful implementation of which would enable the District to make progress toward becoming more energy efficient. These 48 strategies were categorized by type: those that pertained to specific end-use sectors and those that crossed sector boundaries, categorized as special strategies.

In general, the CEP indicated that we needed to use nonrenewable energy more efficiently, use renewable resources more aggressively, and ensure that the appropriate legislative, administrative and regulatory mechanisms were in place to support wiser utilization of energy in the District. It also recognized that special efforts should be continued to assist those citizens most in need in keeping up with the cost of energy, at least until their homes could be made more energy efficient through the installation of energy-saving measures and the adoption of common sense conservation strategies.

**This plan was divided
into five sectors: DC
Government, Residential,
Commercial/Industrial,
Institutional and
Transportation**

With the successful implementation of the 48 recommended measures over the five-year period of 1986-1990, it was estimated that over 10 trillion Btu, or 6% of the total amount of energy consumed in DC in 1982, would be saved. This figure translated into more than \$100 million or 72 million gallons of fuel oil, enough to heat, for one full year, all homes in the District of Columbia that were categorized at or below the poverty level in the 1980 census.

The original Comprehensive Energy Plan represented the first coordinated strategy for the District to become energy efficient. In 1990, another CEP was prepared (CEP II), this time for the period 1991-1996. However, due to personnel and budget constraints, it was neither completed nor published.

This new Plan (CEP III) covers the years 2003-2007. In the 25 years that the DC Energy Office has been in existence, much has been achieved, but much remains to be done and new challenges must be faced. CEP III, following a

format similar to that of CEP I, is built upon that foundation and will take us well into the new millennium.

CEP III contains 43 recommendations - 21 sector strategy recommendations and 22 special strategy recommendations. In addition to providing a sector-by-sector division of the recommendations, they are arrayed across three broad themes and nine sub-themes:

Increasing Energy Awareness and Innovation

- Increasing Energy efficiency Awareness
- Promoting Renewable Energy Use
- Stimulating Innovation
- Improving Air Quality

Enhancing Energy Availability and Affordability

- Expanding Energy Affordability
- Aggregating Energy Purchases
- Using the Regulatory Process to Implement Change

Promoting Energy Collaboration and Security

- Enhancing Collaborations and Partnerships
- Ensuring Energy Security

These two approaches - by sector/special strategy and by theme/sub-theme - provide convenient tools to grasp, implement and monitor the effectiveness of the 43 recommendations.

CHAPTER V

MATRIX OF THE RECOMMENDATIONS

Introduction

A matrix of the 43 recommendations in this Plan is included in this chapter, differentiated by sector and special strategy. Each recommendation is identified by theme, sub-theme and topic. In addition, the sector and special strategy goals are delineated. A quick overview of the recommendations is thus provided in a series of matrices.

Energy Themes and Sub-Themes

Several key themes, initiatives and approaches emerge that suggest a future energy focus for the DC Government as a whole, the DC Energy Office in particular, and all the various stakeholders in the city. These themes highlight the interrelationships among the 43 recommendations and provide a focus for collective action on the part of the public, private and non-profit sectors to work to reach the goals of CEP III. Table V-1 lists these themes and sub-themes:

CEP III THEMES & SUB-THEMES		
Themes	Sub-Themes	
Increasing Energy Efficiency & Innovation	Increasing energy efficiency awareness	Awareness
	Promoting renewable energy use	Renewables
	Stimulating innovation	Innovation
	Improving air quality	Air Quality
Enhancing Energy Affordability & Availability	Expanding energy affordability	Affordability
	Aggregating energy purchases	Availability
	Using the regulatory process to implement change	Regulation
Promoting Energy Collaboration & Security	Enhancing collaborations and partnerships	Collaboration
	Ensuring energy security	Security

Table V-1

ENERGY THEMES FOR THE FUTURE

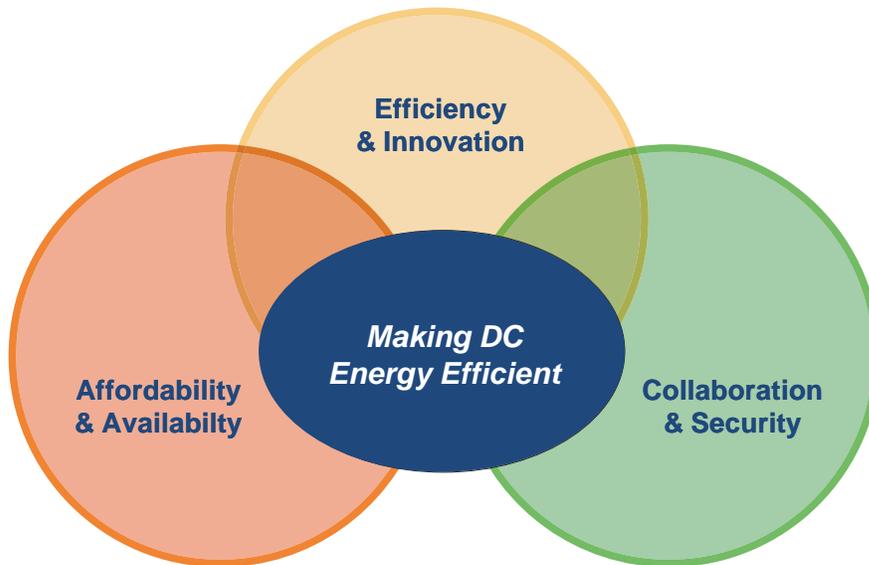


Figure V-1

Theme: Increasing Energy Efficiency and Innovation

This theme focuses on the reduction in consumption through expanding energy efficiency awareness, facilitating the adoption of energy efficiency practices and technologies, and using alternative fuels. Innovation relates to technologies, programs and practices.

Increasing Energy Efficiency Awareness: Increased energy efficiency awareness expands the knowledge of benefits, some which include reduced energy consumption, lower energy costs, improved air quality, and increased energy independence. Energy awareness is the first step to actions that will lead to the desired result of a more energy efficient city. Increasing energy awareness in the Government Sector covers the adoption of best energy practices (GS-4 and GS-5) for the DC Government. For the Residential Sector, steps proposed include expanding the awareness of opportunities to improve energy efficiency in public housing (RS-5). For the Commercial/Industrial Sector, keeping building planners, builders and managers up-to-date on the latest provisions of the DC Building Code will guide the city toward better energy use as new construction and renovation takes place. One area where the benefits of energy efficiency can reduce operating costs is in buildings of our faith community; IS-2 calls for such a "Green Faith" initiative. EA-8 calls for the expansion of the Residential Energy Assistance Challenge Program to enhance energy efficiency outreach to

LIHEAP and UDP clients. Public information and education play a major role in promoting energy awareness. PI-1 focuses on future energy decision-makers by calling for the expansion of the DCEO energy curriculum for grades K-12. An enhanced energy hotline (PI-2) becomes an important channel to communicate information. PI-5 calls for an energy awards program for outstanding efforts in areas such as energy efficiency, renewables and innovation, providing an opportunity to publicize efforts that are being taken to help the city become energy efficient.

Promoting Renewable Energy Use: The DC Government can play a major role in promoting renewable and other alternative energy sources by working with public, non-profit and private organizations to increase overall awareness of the part that these energy sources can play in improving energy efficiency and air quality. RS-4 promotes the establishment of a grants program for residential electric customers to subsidize the incremental costs of Green Power. RD-1 calls for supporting an increase in the development and application of renewable energy technologies such as active, passive, and photovoltaic solar energy. As noted in the recommendations under Regulatory Intervention, using the regulatory process to promote the expanded use of renewable energy in the District is a strategy that DCEO promotes.

Stimulating Innovation: Energy innovation comes in several forms - creating new or improving existing programs and adopting new technologies to promote energy efficiency. Improved planning by District Government agencies (GS-1), better real-time data to better manage energy use (GS-2), and an alternative procurement process (GS-3) will enhance the ability of agencies to install energy efficiency technologies. RS-1 calls for the implementation of a Home Energy Rating System to help homebuyers reduce their energy costs of ownership. TS-3 encourages the promotion of the use of "station cars" as a way to improve the energy efficient movement of people around the city. An improved DCEO website (PI-5), an enhanced media production capability (PI-4), and the establishment of a model "Zero Energy House" (PI-6) provide alternative ways to disseminate information to energy consumers to encourage them to adopt energy efficient technologies and practices. EA-5, EA-6 and EA-7 promote the use of technology to improve service delivery to LIHEAP customers. RD-2 calls for the establishment of an energy transfer program to facilitate the speed at which new technologies are adopted throughout the city.

Improving Air Quality: In the DC metropolitan area, the major source of air pollution comes from automobile exhaust. While TS-1 and TS-2 directly addresses air quality by an increased use in alternative fuels, throughout the Transportation Sector it is noted that the extent to which the District can reduce the number of cars, improve traffic congestion, promote mass transit and increase the number of opportunities for alternative fuel vehicles, the cleaner will be the city's air. TS-5 highlights the benefits of using Intelligent

Transportation Systems to facilitate traffic flow, thereby having the effects of reducing energy consumption, improving air quality, and increasing motorist satisfaction. Beyond the reduction of gasoline consumption, the lessening of use of any fossil fuel - by promoting energy efficiency, expanding conservation, and increasing the use of renewable sources energy - will improve air quality.

Theme: Enhancing Energy Affordability and Availability

The focus of this theme is on mitigating the effects of rising energy prices and energy expenditures. It highlights measures to promote affordability and to increase the traditional and non-traditional supplies of energy.

Expanding Energy Affordability: Local tax incentives to encourage investment in residential renewable systems for both single- and multi-family dwellings (RS-3), business tax incentives and attractive loan programs to promote energy efficiency (CI-2), institutional matching grants to help underwrite the costs of energy improvements (IS-1), and enhancing LIHEAP program options (EA-1, EA-2, EA-3) present an array of options to improve the affordability of investing in energy efficiency to reduce energy consumption across the board in the District and to mitigate against the effect of rising energy prices. In addition, the Residential Conservation Assistance Program (RCAP) should be expanded to incorporate a new, comprehensive whole-house approach called "Weatherization Plus" (RS-2).

Aggregating Energy Purchasers: The District of Columbia Government can play an increasingly significant role in ensuring the adequacy of energy supplies and the best price given constantly fluctuating market conditions, especially in the new era of utility deregulation. RI-2 calls for the District Government to proceed with its Municipal Aggregation Program and for extending that program to independent government agencies. As noted under the Regulatory Intervention section, the Reliable Energy Trust Fund has provisions for the Residential Aid Discount (RAD) Aggregation Program that the city should pursue.

Using the Regulatory Process to Implement Change: Given the changes in the regulatory and legislative landscapes, the uncertainty about energy prices and availability, and the possible effects of climate change and other ramifications of living in a carbon-based economy, the CEP III calls for DCEO to use its mandate to continue its intervention before the Public Service Commission, the DC Council, and the U.S. Congress where appropriate, to protect low-income ratepayers, promote energy efficiency, and encourage the use of renewable energy resources. RI-1 calls for a five-year strategic plan to fully address all the provisions of the legislation that established the Reliable Energy Trust Fund. In addition, DCEO will pursue the creation of long-term rate-based initiatives for the gas and telecommunication industries similar to the RETF for electricity that will benefit all end-use sectors of the District of Columbia. These activities may be expanded to operate on a regional basis

as well. Assessment authority (RI-4) would provide funding necessary for DCEO to represent low-income consumers and the DC Government before the PSC to help ensure the city continues to use energy wisely and that support is provided for those residents who need financial assistance. RI-3 seeks the expansion of distributive generation - for example, renewable energy, small power production, and net metering.

Theme: Promoting Energy Collaboration and Security

This theme focuses on encouraging partnerships and getting stakeholder buy-in. It emphasized that the government cannot by itself make the city energy efficient. Also, it highlights the importance of collective action in responding to energy emergencies.

Enhancing Collaboration and Partnerships: One of the major roles that DCEO plays is ensuring that programs and policies are in place and that information is disseminated. The real energy action is with the agency heads, residents, building operators and energy suppliers. In order for DC to become increasingly energy efficient, DCEO will have to rely on its "partners." As noted previously in the Government Sector discussion of energy efficiency awareness, improvements will come as DC agencies plan and make use of energy audits. CI-3 notes the importance of the DC Government working with the Commercial/Industrial Sector. IS-3 focuses on linking the Institutional Sector to citywide energy goals. The Transportation Sector highlights the importance of working with WMATA and COG (TS-4).

Ensuring Energy Security: In addition to having formalized plans to respond to energy emergencies, the expansion of energy conservation, renewable energy, alternative fuels, distributed generation and aggregate fuel purchases will all lead to improving the energy security of the District. The CEP III provides a framework for this two-fold approach to energy security - emergency response and energy independence. EP-1 and EP-2 outline steps to enhance the District's emergency planning and improve its response to emergency situations.

Conclusion

The following pages contain each of the 43 recommendations presented in the same sequence as in Chapter IV - by sector and special strategy. The strategy goals are delineated, and each recommendation is categorized by theme, sub-theme and topic. These matrices provide a handy guide for the District to continue on its journey toward an energy efficient future.

DC Government Sector				
GOALS: <ul style="list-style-type: none"> • To reduce District Government energy consumption by 1% per year; • To improve District Government energy program effectiveness; • To increase District Government energy innovativeness by implementing creative energy projects. 				
Number	Theme	Sub-Theme	Topic	Recommendation
GS-1	Efficiency & Innovation	Innovation	Agency Energy Management Plans	Each District Government agency should submit an Energy Management Plan by March 31, 2004, and implement Project SAVE (Save Agencies Valuable Energy) beginning Oct. 1, 2004.
GS-2	Efficiency & Innovation	Innovation	Monitoring Energy Use	The District Government should adopt BACnet (<u>B</u> uilding <u>A</u> utomation and <u>C</u> ontrol <u>n</u> etwork) for the monitoring, control and reporting of its energy use.
GS-3	Efficiency & Innovation	Innovation	Cost Sharing to Promote Agency Energy Conservation	Procurement barriers should be removed to allow the utilization of performance contracting and other alternative financing options to increase the adoption of energy efficiency measures by the DC Government.
GS-4	Efficiency & Innovation	Awareness	Energy Star Program	The District of Columbia Government should become a partner of EPA's Energy Star program to encourage agencies to procure Energy Star labeled products.
GS-5	Efficiency & Innovation	Awareness	Energy Audits of DC Government Facilities	Energy audits of all District Government-owned buildings should be conducted and owners of leased facilities in excess of 10,000 square feet should be required to conduct an energy audit prior to the signing or renewal of a lease.

Residential Sector				
GOALS:				
<ul style="list-style-type: none"> • To reduce residential energy consumption by 1% per year; • To improve residential energy program effectiveness; • To ensure that market transformation benefits residential energy consumers. 				
Number	Theme	Sub-Theme	Topic	Recommendation
RS-1	Efficiency & Innovation	Innovation	Home Energy Rating System	A Home Energy Rating System (HERS) should be established, along with a residential loan program meeting the requirements of Fannie Mae's Energy Efficiency Mortgage (EEM) and Energy Efficient Loan (EEL) programs, allowing homebuyers to more easily purchase energy efficient homes or improve existing ones.
RS-2	Affordability & Availability	Affordability	Weatherization Plus	The Residential Conservation Assistance Program (RCAP) for low-income residential households should be expanded to incorporate a new, comprehensive whole-house approach called Weatherization Plus that uses advanced, cost-effective technologies.
RS-3	Affordability & Availability	Affordability	Local Tax Incentives	Local tax incentives should be established to encourage investment in residential renewable energy systems for both single- and multi-family dwellings.
RS-4	Efficiency & Innovation	Renewables	Green Power	A grants program for residential electric customers should be established to help subsidize the incremental cost of green power.
RS-5	Efficiency & Innovation	Awareness	Public Housing	A catalog of resources should be compiled to assist in identifying and accessing programs that offer incentives for the installation of energy efficiency measures in public housing.

Commercial/Industrial Sector				
GOALS:				
<ul style="list-style-type: none"> • To reduce commercial/industrial energy consumption by 1% per year; • To improve commercial/industrial energy program effectiveness; • To ensure that market transformation benefits commercial/industrial energy consumers. 				
Number	Theme	Sub-Theme	Topic	Recommendation
CI-1	Efficiency & Innovation	Awareness	Training	Training should be provided to the members of the building code community (designers, builders, plan reviewers and inspectors) to ensure awareness, compliance and enforcement of the latest provisions of the energy codes.
CI-2	Affordability & Availability	Affordability	Tax & Financial Incentives	Tax incentives and attractive loan rates should be offered for new and existing buildings that qualify at the Silver or above Leadership in Energy and Environmental Design (LEED) level or buildings that earn the Energy Star building performance label, and free energy audits should be provided to small businesses and rebates offered for using alternative energy sources.
CI-3	Collaboration & Security	Collaboration	Partnerships	Partnerships with key commercial and industrial associations and support groups should be forged to collectively sponsor educational seminars/workshops, provide and disseminate energy information, promote the benefits of energy conservation and efficiency, and provide assistance to local businesses to develop markets for recycled products.

Institutional Sector				
GOALS:				
<ul style="list-style-type: none"> • To reduce institutional energy consumption by 1% per year; • To improve institutional energy program effectiveness; • To ensure that market transformation benefits institutional energy consumers. 				
Number	Theme	Sub-Theme	Topic	Recommendation
IS-1	Affordability & Availability	Affordability	Matching Grants	The Institutional Conservation Program, which focused on energy efficiency in schools and hospitals by providing matching grants to schools and hospitals for engineering, acquisition and installation of energy efficient capital improvements, should be resurrected.
IS-2	Efficiency & Innovation	Innovation	Green Faith	A Green Faith drive should be launched, aimed at reducing energy usage in faith congregations in the District of Columbia.
IS-3	Collaboration & Security	Collaboration	Conference	A conference for the Institutional Sector should be convened whose objectives would include both an identification of energy efficient best practices and the cooperative development of collective institutional strategies for achieving energy efficiency.

Transportation Sector				
GOALS:				
<ul style="list-style-type: none"> • To reduce transportation energy consumption by 1% per year; • To improve transportation energy program effectiveness and system efficiency. 				
Number	Theme	Sub-Theme	Topic	Recommendation
TS-1	Efficiency & Innovation	Air Quality	Alternative Fuels & Air Quality	The District should encourage the use of AFV fuels by both public and private sector individual motorists and fleets, and enhance efforts to place associated refueling and recharging equipment at facilities accessible for public use.
TS-2	Efficiency & Innovation	Air Quality	Alternative Fuels & Air Quality	DCEO should collaborate with WMATA to enhance progress in AFV transit bus acquisition in order to reduce the District's dependency on foreign petroleum, mitigate its exposure to high petroleum fuel prices and reduce air pollution.
TS-3	Efficiency & Innovation	Innovation	"Station Cars"	The District should explore opportunities for the use of station cars and similar means of moving from transit stop to workplace, work closely with WMATA to foster public use of transit, and accelerate employer and worker acceptance of non-traditional modes for work including telecommuting.
TS-4	Collaboration & Security	Collaboration	Parking Subsidies	The District should coordinate with COG to identify private sector, local government and institutions employers in both the District and the region who could reduce or eliminate parking subsidies and initiate, expand, encourage and underwrite alternative transportation choices for drive-alone employees.
TS-5	Efficiency & Innovation	Air Quality	Traffic & Intelligent Transportation Systems	The District Department of Transportation should expand the use of Intelligent Transportation Systems such as closed-circuit TV, variable message signs and highway advisory radio to improve traffic flow, and investigate several additional, emerging, systems for driver and passenger use.

Energy Assistance				
GOALS: <ul style="list-style-type: none"> • To enhance the delivery of energy assistance services to the eligible population; • To inform clients through counseling and workshops so that they can better manage their energy budgets. 				
Number	Theme	Sub-Theme	Topic	Recommendation
EA-1	Affordability & Availability	Affordability	Percentage of Income Payment Plan (PIPP)	DCEO, in concert with Washington Gas, PEPSCO and the DC Public Service Commission should explore the development and implementation of a Percentage of Income Payment Plan (PIPP) for the low-income residents of the District of Columbia.
EA-2	Affordability & Availability	Affordability	Energy efficiency Workshops for LIHEAP Customers	DCEO should resume energy conservation education for all low-income customers applying for energy assistance, as well as for other interested District of Columbia energy consumers.
EA-3	Affordability & Availability	Affordability	Counseling for LIHEAP Customers	Individualized counseling, including household budgeting, utilization of other energy services, and referrals for upward mobility and employment should be made available to LIHEAP and UDP customers.
EA-4	Affordability & Availability	Regulation	RETF Funding	DCEO should petition the Public Service Commission to request that Reliable Energy Trust Funds be made available to the LIHEAP so that more needy low-income households can be served, thereby lessening tremendous energy burdens and improving the quality of life for many.
EA-5	Efficiency & Innovation	Innovation	Wireless Technology for Homebound Outreach	Wireless technology should be adapted and implemented for use in the LIHEAP homebound component to better and more expeditiously serve the needy customers of the District of Columbia.
EA-6	Efficiency & Innovation	Innovation	Electronic Processing of Utility Payments	Electronic payment of LIHEAP utility benefits should be designed and implemented so that utilities can apply benefits to customer accounts more expeditiously.
EA-7	Efficiency & Innovation	Innovation	Electronic Benefits Transfer (EBT)	The Capital Access Electronic Benefits Transfer (EBT) capability should be designed and implemented for LIHEAP customers whose heat is included in the rent, thus providing for a more cost-effective operation while allowing needed cash to be more readily available to customers.
EA-8	Affordability & Availability	Awareness	Residential Energy Assistance Challenge Program	DCEO should utilize the Residential Energy Assistance Challenge (REACH) as part of its marketing campaign for LIHEAP and UDP programs.

Education/Public Information				
GOALS: <ul style="list-style-type: none"> • To expand public awareness about energy efficient living; • To enhance energy education within public and private schools; • To increase knowledge of and access to DCEO programs. 				
Number	Theme	Sub-Theme	Topic	Recommendation
PI-1	Efficiency & Innovation	Awareness	Energy Curriculum	Interactive computer activities should be incorporated into the public school energy curriculum for grades K-12.
PI-2	Efficiency & Innovation	Awareness	DC Energy Hotline	The DC Energy Hotline should provide information that would promote green choices for energy efficiency for all DC consumers, especially in the residential sector.
PI-3	Efficiency & Innovation	Innovation	DCEO Website	The DCEO website should be redesigned to be more consumer friendly and to allow for interactive participation of people visiting the site.
PI-4	Efficiency & Innovation	Innovation	Media Production	A media production capability should be established to produce short videos specific to each DCEO program.
PI-5	Efficiency & Innovation	Awareness	Energy Awards Programs	A Mayor's awards program for energy efficiency should be created using established energy efficiency standards as benchmarks to be reached or surpassed.
PI-6	Efficiency & Innovation	Innovation	Zero Energy Home	An existing residential structure in DC should be rehabilitated as a model "Zero Energy Home" to showcase energy efficiency and alternative energy sources.

Regulatory Intervention				
<p>GOALS:</p> <ul style="list-style-type: none"> • To sustain an effective presence before the Public Service Commission and the DC Council to promote energy efficiency and renewables and to ensure fair utility rates and practices; • To assess the effects of the changes in the regulatory environment and energy markets on energy consumers; • To mitigate the effects of utility prices on low-income consumers and the DC Government. 				
Number	Theme	Sub-Theme	Topic	Recommendation
RI-1	Affordability & Availability	Regulation	Reliable Energy Trust Fund (RETF)	A five-year strategic plan should be implemented to address the areas of focus of the legislation governing the RETF, which are energy efficiency, renewable energy and low-income electric customers.
RI-2	Affordability & Availability	Availability	Municipal Aggregation Program (DC MAP)	A District of Columbia Municipal Aggregation Program should be developed and implemented.
RI-3	Affordability & Availability	Regulation	Distributive Generation	Innovative distributed generation options should be advocated before the PSC, including renewable energy options, small power production and net metering.
RI-4	Affordability & Availability	Regulation	Assessment Authority	DCEO should be given the authority to assess the costs of intervening on behalf of low-income residents and the DC Government before the PSC to the utilities and energy suppliers operating within the District of Columbia.

Research and Development				
GOALS: <ul style="list-style-type: none"> • To accelerate the implementation of new energy efficiency technologies; • To assess the effectiveness of newly adopted energy efficiency technologies; • To foster an energy research and development environment in the District. 				
Number	Theme	Sub-Theme	Topic	Recommendation
RD-1	Efficiency & Innovation	Renewables	Development & Application of Renewables	Support should be provided to increase the development and application of renewable energy technologies such as active, passive and photovoltaic solar energy, fuel cells, and other sustainable sources of energy.
RD-2	Efficiency & Innovation	Innovation	Energy Technology Transfer Program	DCEO should establish an energy technology transfer program with local public, educational, research, business and civic/community-based organizations to support the development and commercialization of promising and existing energy efficiency technologies for District of Columbia households, businesses and institutions.

Emergency Planning				
GOALS: <ul style="list-style-type: none"> • To ensure the development of appropriate plans to sustain the availability of energy in case of an emergency; • To ensure the coordination among groups involved in emergency planning, preparedness and response. 				
Number	Theme	Sub-Theme	Topic	Recommendation
EP-1	Collaboration & Security	Security	Regional Energy Emergency Response Planning	Regional coordination should be included in any energy emergency planning or plan revisions, and DC should participate in any regional exercises that may be undertaken by COG.
EP-2	Collaboration & Security	Security	Local Energy Emergency Response Planning	An Energy Emergency Response Plan should be prepared by updating and consolidating existing District of Columbia energy emergency preparedness plans, and appropriate training should be provided to DCEO staff and other relevant personnel.

CHAPTER IV

RECOMMENDATIONS

Introduction

This Comprehensive Energy Plan presents a series of recommendations to continue to make the District an energy efficient city during the period 2003-2007. The sector strategies cover the major end-use sectors - Government, Residential, Commercial/Industrial, Institutional and Transportation. The special strategies influence the end-use sectors and cover areas related to Energy Assistance, Education/Public Information, Regulatory Intervention, Research and Development, and Emergency Planning. Table IV-1 distributes the recommendations among the strategies.

Breakdown of Recommendations

Sector Strategies	
Government	5
Residential	5
Commercial/Industrial	3
Institutional	3
Transportation	5
Subtotal	21
Special Strategies	
Energy Assistance	8
Education/Public Information	6
Regulatory Intervention	4
Research and Development	2
Emergency Planning	2
Subtotal	22
Total # of CEP III Recommendations	43

Table IV-1

The District has an evolving energy policy, legal and regulatory framework that will serve the city in the new energy environment of utility deregulation. Programs that are a part of this evolving framework cut across all five end-use sectors and across the special strategies. Many of the framework's parts are already in place - for example, some legislation, regulatory guidelines and programs; others need to be addressed, such as expanded funding.

To make the District of Columbia more energy efficient, the city needs to adopt a three-fold approach - to continue the reduction in energy consumption, to militate against the increases in energy prices and expenditures, and to promote collaboration and energy security. To that end, DCEO has proposed 43 recommendations that address various end-use sector and special strategies.

Setting the Context

As outlined in Chapter II, several economic, demographic, market, policy and energy trends are transforming the energy landscape for the District and creating new energy challenges. Table IV-2 summarizes some of the key economic and energy trends, highlighting both the District's energy gains in the 1990s and its energy challenges in the 2000s.

For the five-year period 1995-1999, the District experienced a drop in energy consumption of about 1% per year - or 5% for the period. If the trends for this period were to continue to 2007, then in that year the District would be producing 23.55% more goods and services while using 6.20% less energy than in 1999.

SELECTED KEY DISTRICT-WIDE ENERGY TRENDS						
Trend	Units	Actual			Projected	
		5-Year Average 1995-1999	Average Annual % Change	Actual 1999	Trend 2007	% Change 2000-2007
Gross State Product (GSP) (Economic Activity)	Million \$	51,093.20	3.07%	55,832.00	68,980.82	23.55%
Consumer Price Index (CPI-U)	NA	159.88	1.70%	166.60	187.53	12.56%
Energy Consumption	Million Btu	174.92	-0.91%	169.80	159.27	-6.20%
Energy Prices	\$ Per Million Btu	12.91	0.57%	13.23	13.77	4.09%
Energy Expenditures	Million \$	1,314.74	2.87%	1,311.20	1,598.58	21.92%
Real Energy Prices	\$ Per Million Btu	8.08	-0.44%	7.94	7.70	-3.06%
Real Energy Expenditures	Million \$	823.02	-1.25%	787.03	720.53	-8.45%

Table IV-2

While the District witnessed average annual percentage decreases in consumption in the second half of the 1990s, it experienced average annual increases in energy prices and energy expenditures. Energy prices rose on average a little more than 0.5% per year, while total energy expenditures increased on average 2.87% a year. Looking forward to 2007, although energy consumption would be lower in that year than in 1999, energy prices (4.09%) and total energy expenditures (21.92%) would be higher as well.

However, without the downward trend in energy consumption, the upward trend in energy expenditures would be even higher in 2007 than the projected late-1990 trends. Thus the various energy efficiency measures that end-use sectors adopted in the 1990s will reduce energy consumption and avoid unnecessary increases in energy expenditures.

Another bright spot is related to the energy price and expenditure data. In 2007, inflation-adjusted energy prices would be 3.06% lower and inflation-adjusted energy expenditures would be 8.45% lower than in 1999, if the late-1990 trends continue.

Energy Themes

These trends suggest a set of three broad themes and nine sub-themes:

CEP III THEMES & SUB-THEMES	
THEMES	SUB-THEMES
Increasing Energy Efficiency & Innovation	<ul style="list-style-type: none"> Increasing energy efficiency awareness Promoting renewable energy use Stimulating innovation Improving air quality
Enhancing Energy Affordability & Availability	<ul style="list-style-type: none"> Expanding energy affordability Aggregating energy purchases Using the regulatory process to implement change
Promoting Energy Collaboration & Security	<ul style="list-style-type: none"> Enhancing collaborations and partnerships Ensuring energy security

Table IV-3

Increasing Energy Efficiency and Innovation

The theme "Increasing Energy Efficiency and Innovation" focuses on reducing consumption. The citywide goal would be to continue the downward trend in energy consumption at a rate of 1% per year. However, that desired goal might be difficult to reach with the projected increases in population, residential and commercial construction and employment. Although this historical downward trend will not be easy to sustain, the District can continue toward a more energy efficient city if there is collective action on the part of residents, businesses and government to keep:

- The rate of residential energy growth below the rate of growth of population, of households, and new residential construction;
- The rate of commercial/industrial energy growth below the rate of growth of overall economic activity, of employment, and of new construction;
- The rate of institutional energy growth below the rate of growth of goods and services that organizations in the Institutional Sector provide;
- The rate of transportation energy growth below the rate of growth of vehicle miles traveled.

If the District were to meet these goals, the city would reap several benefits:

- Increased energy efficiency;
- Reduced dependence on energy and effects of fluctuations in energy markets;
- Increased avoidance of unnecessary energy expenses;
- Improved air and water quality.

Enhancing Energy Availability and Affordability

The theme "Enhancing Energy Availability and Affordability" focuses on price and expenditure goals. These goals set direction toward increasing energy affordability and providing buffers, to the extent possible, from the fluctuations in energy markets. Affordability and availability efforts will become particularly important in the new energy era of deregulation and consumer choice. Five broad price and expenditure goals are:

- To develop and expand energy aggregation programs;
- To use the regulatory process to ensure that local energy markets are operating efficiently;
- To promote the transformation of markets to expand the availability of energy efficiency technologies;
- To expand the use of alternative fuels, distributive generation and "green power";
- To provide financial assistance where appropriate.

If the District were to meet these goals, the city would reap several benefits:

- Expanded sources of energy supply;
- Increased opportunities to reduce the cost of energy;
- Increased financial stability for those who are economically vulnerable.

Promoting Energy Collaboration and Security

The theme "Promoting Energy Collaboration and Security" focuses on creating productive partnerships and other collaborative efforts to create a framework for collective action and on creating a framework to respond to energy emergencies due to interruptions in supply. Two broad goals are:

- To create and sustain partnerships to promote joint action to achieve citywide energy goals;
- To create a framework for collective preparation and response to energy emergencies.

If the District were to meet these goals, the city would reap several benefits:

- Coordinated efforts to meet citywide energy initiatives;
- Coordinated responses to energy emergencies.

In sum, energy efficiency and security in the District can be attained through conservation, cooperation, and planning. Part of the implementation process will be for DCEO to work with various constituencies to review the goals and to make them operational. The recommendations in this Plan will guide the District's energy future and lead the city toward becoming more energy efficient, affordable, innovative and - fitting for the nation's capital - a model for other jurisdictions.

SECTOR STRATEGIES

DC Government Sector



John Wilson Building houses DC government agencies and District Council.

Goals

- To reduce District Government energy consumption by 1% per year;
- To improve District Government energy program effectiveness;
- To increase District Government energy innovativeness by implementing creative energy projects.

Overview

Under the Home Rule Charter, the DC Council enacted legislation, signed into law in January 1981, to establish the DC Energy Office. Although the District Government was already developing state energy plans and helping manage serious petroleum shortages, this legislation (DC Law 3-132) established the DC Energy Office as the statutorily created lead agency on energy plans, policies and programs for the District. It also mandates the development of a Comprehensive Energy Plan that would propose measures to conserve energy, have a favorable impact on the DC budget, improve the local economy, create jobs and help the environment. Since its inception, recognizing the importance of focusing on energy conservation and efficiency for the District Government Sector, DCEO has been:

- A major player in the evolving legislative, policy and regulatory energy landscape;
- The driving force behind the creation of plans and programs that curbed the growth of energy costs and usage;
- The educational vehicle for raising public and private awareness on the importance of energy conservation and efficiency and ways to achieve both.

Expenditures for energy were a major factor in the overall cost of government services. Twenty-five years ago, the District Government spent \$39.5 million on energy use, which represented 12% of the total energy dollars spent in the District of Columbia. As shown in Figure GS-1, a peak expenditure of \$91 million occurred in 1994, and by 2001, energy expense had decreased to \$51 million due to a number of factors: labor force reductions, energy rate decreases, the transfer to the DC Housing Authority at the end of 2000 responsibility for its own utility bills, the implementation of energy efficiency and conservation measures recommended in DCEO's initial and subsequent Comprehensive Energy Plans, and the promotion of energy savings activities in the District-owned buildings under the direct purview of the DC Office of Property Management through contracts as well as teaming with other agencies, such as the Office of the Chief Technology Officer (OCTO) and the DC Public Schools.

The overall decrease in energy costs for the District Government is down 45% from the 1994 level and 38% from 1990. Nevertheless, the approximately \$55 million spent by the District Government annually on energy still represents 4% of the \$1.3 billion spent on energy by all sectors in the District of Columbia each year, a significant expense item in the District Government's budget. Clearly, energy expenditures continue to represent a ripe opportunity for cost reduction in the District Government's budget that can be achieved through continued conservation and efficient use.

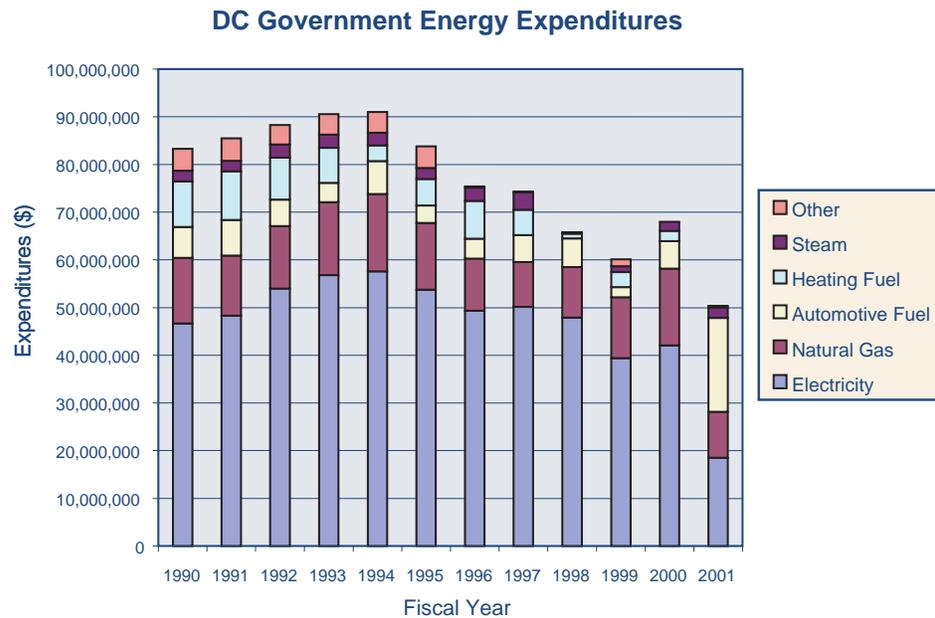


Figure GS-1

In the first CEP, covering the period 1986-1990, nine major energy efficiency and conservation initiatives were identified for implementation in the DC Government. Many of these programs were implemented in full or in part; in some cases, efforts were re-directed due to regulatory or organizational changes. Although it is difficult to calculate the energy savings resulting from each of the initiatives, savings are conservatively estimated at \$2.5 million per year. Earlier CEPs placed emphasis on educating consumers/decision-makers, assessing and planning energy conservation and efficiency programs and implementing technology improvements in key areas. DCEO, through its Energy Extension Service, conducted hundreds of workshops on low-cost/no-cost techniques for lowering fuel bills. Prime examples of the conservation and efficiency initiatives implemented under earlier CEPs are the thousands of residential energy audits and weatherization programs in public housing units. In the area of technology, DCEO funded the development of an automated energy consumption and cost-monitoring system for all DC Government agencies. Of particular note in the technology arena is the District's plan to implement a state-of-the-art building automation system. After several years of extensive assessment and planning, the Office of the Chief Technology Officer selected BACnet (Building Automation and Control network), a tried and proven system for central management of building energy, utilities and security utilizing the new citywide fiber-optic network, DC-NET, for interconnection of all building automation systems. The DC Housing Authority, an independent agency of the District Government, is already proceeding with its Energy and Environmental Master Plan employing these technologies.

DCHA, which is responsible for 55 sites and spends an estimated \$16 million for energy costs each year, developed its Master Plan with 12 tasks that, when implemented, will provide DCHA with:

- Reductions in construction, operational and capital costs;
- Reductions in utility billing administration;
- Aggregate energy commodity purchasing and distribution.

In addition, DCHA plans to establish and champion the Capital City Rebuild Initiative in conjunction with DCEO as the premier community-based sustainable energy and environmental program, utilizing DOE's Rebuild America, which focuses on improving the quality of life in communities by using energy savings to modernize buildings, as the gateway program.

Even though the District Government and independent authorities such as DCHA have made considerable progress in more efficient and conservative use of energy since DCEO's first CEP, the energy landscape is constantly changing and energy challenges continue to mount. It is imperative to continue many of the programs identified in earlier CEPs, collaborate with independent authorities/associations, and add supplemental programs in order to achieve a sustainable energy position for the District Government Sector. This CEP continues to emphasize these areas and include measures to gauge performance of recommended energy initiatives.

A review of the labor force plans of the agencies comprising the District Government reveals no significant growth through 2007. Even though there may be organizational changes over this CEP planning period (2003-2007), no major change is anticipated in the number of workers or the number of buildings owned or leased by the District Government. There are expected changes in the location of some of the space driven by the relocation of District Government employees to buildings with improved working conditions. Office relocation provides an attractive opportunity to ensure that personnel moves are made to energy efficient buildings. Table GS-1 shows the energy forecast for the District Government by type of energy used and total energy expense. In 2003, electricity (39%) and natural gas (32%) will constitute 71% of the energy sources used, and it is anticipated will continue to be the primary energy sources. The overall annual increase is 1.4%, which tracks with EIA's forecasted increase in annual energy consumption. However, energy rates are not expected to remain stable given the national and world energy picture, which could limit the supply of energy in the short term as well as the continuation of an economic slowdown. EIA, in its Annual Energy Outlook for 2020, focuses on long-term events that will impact energy such as the supplies and prices of fossil fuels, the development of the U.S. electricity markets, technology improvements and the impact of economic growth. To a large extent, these events are not within the control of the District Government, thereby making energy conservation and efficiency the key venues to sustainable energy for the District Government Sector.

DC Government Energy Expenditure Forecast

Energy Source	FY 2002	FY 2003
Electricity	\$ 23,520,175	\$ 23,854,265
Natural Gas	19,149,293	19,302,932
Diesel - Fuel	8,414,088	8,327,687
Steam	902,877	1,212,362
Total	\$ 51,988,435	\$ 52,699,249

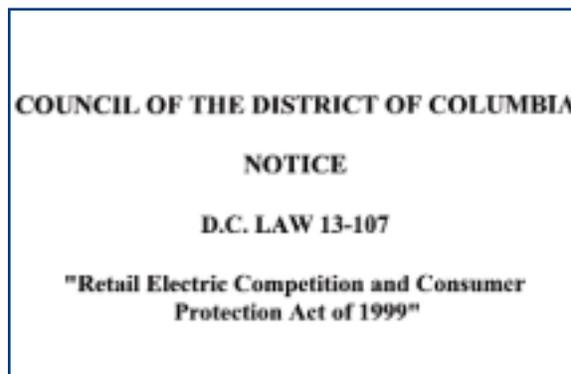
Source: DC Office of Property Management

Table GS-1

Another dimension of the District Government's energy landscape is its almost total dependence on outside energy services. Further, 85% of the dollars spent on energy do not turn over once in the District. The District imports 90% of its electricity and all of its natural gas. Unlike most states, the District does not have natural resources that could be used to generate energy; it can only rely on using renewable energy sources. This condition leaves the District more vulnerable to energy source supply and demand dynamics, further reinforcing a sustainable energy position for the District Government via the efficient and conservative use of energy.

Needs and Challenges of the DC Government Sector

The District Government estimates that it will spend \$53 million on energy in 2003, a modest increase of 1.4% over 2002. Over the same period, the government's inventory of owned and leased square feet of space under its



The Retail Electric Competition and Consumer Protection Act of 1999 opened the door for DC residents to purchase electricity from other suppliers.

management will remain about the same. Many organizations tend to de-emphasize or place less focus on expenditure areas when expenses from one year to the next increase modestly or remain about the same. However, this is a luxury that the District Government cannot afford. This is especially true since most of its energy is imported and the District may be faced with financing new production and distribution facilities through increased rates as the nation's energy service companies look to modernize a system of deteriorating infrastructures and add capacity to an already strained energy infrastructure. This expected rise in prices, coupled with an economic recession, may reduce the amount of

energy used, but per unit rates may increase. Without concerted, deliberate efforts to conserve and reduce energy, energy costs will consume an even greater portion of the government's budget, draining dollars from other much-needed public services.

Regulatory changes, organizational alignments and financial resources represent the greatest challenges as the District Government seeks to continue current energy programs and establish new ones to conserve energy and reduce consumption. At the regulatory level, the Federal Anti-Deficiency Act, 31 USC §1341 (1998) prohibits the implementation of projects that entail a multi-year commitment associated with financing options available through energy service companies for the renovation of facilities to make them more energy efficient. With few exceptions, the District's organizational infrastructure is not designed to hold agencies accountable for energy consumption in their owned or leased buildings. Energy conservation planning and implementation are not a compulsory part of the budget review and approval process as it is in other states and jurisdictions. Further, energy management information systems in place in the District's owned/leased buildings are inadequate or not sufficiently integrated to monitor, record and alter the use of energy. However, there are plans to address this situation as BACnet is implemented in all buildings owned and leased by the District Government, where the District Government pays the utilities. At the financial resource level, the District Government is already challenged with the lack of funds to implement many of the public assistance and educational programs needed, placing even greater emphasis on not just maintaining energy expenses, but on reducing this expense item.

One of the major changes in the energy landscape that affects the District Government was the passage of the Retail Electric Competition and Consumer Protection Act of 1999, which essentially restructured the electricity market in the District. While PEPSCO will still manage and distribute electricity, customers now have the choice of a company other than PEPSCO to supply their electricity. In order to take advantage of this opportunity, the DC Government is pursuing a Municipal Aggregation Program whereby it will act as an agent for creating a pool of consumers to purchase electricity, and thus able to negotiate better prices by buying in bulk. All residential consumers, small businesses and DC Government agencies are included in this program.

The tenets of a sustainable energy position for the District Government Sector are assessment and planning, education and awareness, conservation measures implementation and performance measurement. The recommendations are based on the following overarching premises for continued improvements in this Sector's use and conservation of energy:

- The DC Energy Office is the best vehicle for energy program direction and technical oversight and for establishing partnerships among the District agencies, energy service providers, elected officials/other government groups, residents, and public and private entities;

- The DC Office of Property Management is an integral part of the process for energy acquisition, management and conservation, and has a strategic role in implementing energy cost reduction measures in District-owned facilities;
- Customer (stakeholder) participation is critical to energy consumption and conservation;
- A "best practices" approach will be used to mitigate and limit program costs and schedule risks.

In 1987 and 1989, DCEO assessed earlier CEP initiatives and conservatively estimated that approximately 0.75 trillion Btu were saved in the five-year period between 1985 and 1989. While this is impressive, there is no system in place to more completely and accurately capture the savings flowing from energy conservation measures and practices. Annual performance measurements by agency eliminate the need to conduct special studies to determine compliance with energy conservation goals, provide more comprehensive and complete coverage of the actual savings realized, and identify areas for more or less emphasis, while simultaneously providing lessons learned from projects under way or completed.

DC Government Sector Recommendations

Recommendation GS-1

Each District Government agency should submit an Energy Management Plan by March 31, 2004, and implement Project SAVE (Save Agencies Valuable Energy) beginning Oct. 1, 2004.



A good candidate for Project SAVE is the Recorder of Deeds building.

Background

Project SAVE was initially conceived in 1993 but not implemented due to administration changes and regulatory issues that precluded implementation of the concept that provided the financial resources for the SAVE program.

Each agency has its own database of building information and energy consumption, has firsthand knowledge on organizational changes within the agency that could increase/decrease energy use, and is in the ideal position to forecast its needs for the future. The 2003 Energy Plan submission establishes the baseline for subsequent submittals and the implementation of Project SAVE. The Oct. 1, 2004 target date does not interfere with the budget planning process currently underway and provides ample opportunity to plan and forecast energy use for the next fiscal year(s).

The key components of the program should include:

- Mandatory submission of an Energy Management Plan by each District Government agency as part of the budget review and approval process. The Energy Management Plan would be the baseline for assessing an agency's energy initiatives, expected results, and the metrics used to determine performance to the intended energy goals/plans;
- Establishment and use of a formalized rating consideration for the Energy Management Plan in establishing an agency's operating budget, and for assessing the monetary impact of the savings;
- Oversight and support such as training, technical assistance and guidance of the program by DCEO;
- Establishment of an Energy Management Advisory Committee (EMAC) charged with the coordination and collection of consumption and expenditure data, setting of energy targets, and the monitoring of the District Government's energy efficiency performance. EMAC would be headed by DCEO and consist of representatives from the District Government Sector, as follows:
 1. Department of Consumer and Regulatory Affairs
 2. Department of Human Services
 3. Office of Planning
 4. Office of Property Management
 5. Department of Housing and Community Development
 6. Office of Contracts and Procurement
 7. Office of the Chief Financial Officer (Office of Budget and Planning)
 8. Office of the Chief Technology Officer
 9. Department of Employment Services
 10. District Department of Transportation
 11. Metropolitan Police Department
 12. Department of Public Works

and representatives from the following independent authorities:

1. DC Housing Authority
 2. DC Public Schools
 3. DC Sports Commission
 4. University of the District of Columbia
 5. Water and Sewer Authority
 6. Washington Convention Center Authority
- A recommended distribution, by the Office of Budget and Planning, of the saved costs for each energy conservation project would be as follows: 50% to the General Fund; 25% for agency discretionary use and 25% to DCEO to fund additional energy-specific initiatives;
 - Updating of the District of Columbia Government Facilities Energy

Management Plan after the submission of all agency plans (last plan dated May 1982).

Many municipalities have made energy plans and performance an integral part of their budgeting process and either used a performance contracting approach or direct funding to achieve an integrated energy plan. Making the plan submissions mandatory fulfills the dual purpose placing importance on this significant cost factor while simultaneously providing a built-in motivation to assure compliance and reward performance. One of the often-cited best practices that parallels this recommendation was launched by the State of New York under Executive Order No. 132. All state agencies, in cooperation with the Division of Budget, were required to submit an annual Facilities Energy Conservation Plan with the first submission containing goals over a five-year period, energy usage information, and identification of technical assistance and/or energy audits planned/underway with completion schedules and energy efficiency projects planned/under way and associated schedules. Each subsequent plan shows progress toward the goals, realized savings, original plan changes and any employee/facility awards given for energy conservation. New York State provided both technical and financial assistance to agencies for studies/audits and demonstration projects. Although the District Government may not have the funds to finance agency studies/audits, it can provide technical assistance.

Recommendation GS-2

The District Government should adopt BACnet (Building Automation and Control network) for the monitoring, control and reporting of its energy use.



Many DC Government buildings have automated temperature control systems.

Background

In the late 1980s, DCEO funded the development and implementation of an automated energy cost and consumption system that tracked this data by agency. This system made it easier to gather energy use and cost information and to do so more frequently. While this was a key step, energy conservation

can be maximized if there is a system that flags problems and controls the use of energy within a building in a dynamic (real time) mode. Most of the District Government's owned/leased buildings have equipment with control devices, some automated and some not, from various manufacturers. In most cases, control devices from varying manufacturers are not inter-operable and do not share data, and therefore monitoring energy use to more efficiently flag problems cannot be performed in a dynamic mode, thus precluding real-time

modifications and solutions. Further, energy information is not readily available for analysis. BACnet is a non-proprietary, open protocol communication standard that makes inter-operability and data sharing possible among various building equipment manufacturers. BACnet was conceived by a consortium of building management, equipment manufacturers and systems users and developed by Alerton Technologies Inc. The system was adopted by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) in 1995 as the new standard for the industry.

Since its adoption, BACnet has been implemented on a number of projects at airports, commercial office buildings, educational facilities, mixed-use buildings and government buildings. Some examples of the more recent project implementations at government facilities are:

- U.S. Department of Commerce in Washington, DC;
- Arizona State Courts Building;
- Edward A. Garmatz Federal Courthouse in Baltimore;
- Field Museum in Chicago;
- U.S. Courthouse and Federal Building in Las Vegas;
- 450 Golden Gate in San Francisco.

The Office of the Chief Technology Officer has completed an assessment of BACnet and recommended its adoption.

In order to make procurement, operations and maintenance more efficient, as well as lower overall life-cycle costs, the District of Columbia should implement its plans to consolidate the management and control of building automation systems, including energy usage for heating, ventilating and air conditioning, as well as lighting, security and life safety. Uniform specifications and the consolidation of procurement of these systems will allow the District to benefit from both economies of scale and standardized technologies.

Central supervisory control will allow organization of the data flowing from the above systems. Such aggregation will allow bulk purchases, and enable the District to modulate its peak energy and utility usage by leveling across all of its assets. The District should physically interconnect all of its building facilities systems on the District's new fiber-optic citywide private network, known as DC-NET.

All new projects constructed by or on behalf of the District should satisfy the new BACnet-based standards developed by OCTO. With the necessary resources and executive or legislative mandate, OCTO can provide 1) standard building automation system specifications, 2) the RFP for selection of native BACnet vendor with unit prices and assistance with award, 3) standard building automation system sequences of operation, 4) standard communication protocols, and 5) common network infrastructure.

Recommendation GS-3

Procurement barriers should be removed to allow the utilization of performance contracting and other alternative financing options to increase the adoption of energy efficiency measures by the DC Government.



Energy efficiency improvements were done in the Wilson building. Building management has requested Energy Star certification.

Background

Financing options exist that allow agencies to make energy-related improvements with minimum to no investment. The most popular financing mechanisms are the lease-purchase option and the energy-savings performance contract. The former makes possible the acquisition of energy-saving equipment via a monthly payment over multiple years with ownership transferring at the end of the contract, while under an energy-savings performance contract an energy service company makes and finances the necessary improvements and is paid back over multiple years from the utility bill savings the project generates. The Federal Anti-Deficiency Act prohibits the use of multi-year contract commitments, as does the DC Procurement Practices Act of 1985. The Energy and Operational Efficiency Performance-Based Contracting Amendment Act of 2002 (Bill 14-720), if approved, will provide relief by amending the Procurement Practices Act to allow District agencies to enter into energy performance-based contracts of up to 15 years.

In the early 1990s, an exception was made to these barriers and two energy savings performance contracts were entered between the District Government and PEPCO. PEPCO made energy conservation retrofits to the Municipal Center and Fourth District Police Headquarters and, under the "Experimental Conservation Service Rider" approved by the Public Service Commission, PEPCO was allowed to recover the cost of these retrofits on the monthly electric bill over a multi-year period, although ultimately DPW covered the cost of the projects. Nevertheless, collectively, these projects resulted in energy savings in excess of 26% in the first year and 25% the second year. Once Bill 14-720 becomes law, a minimum of 10 projects should be identified and scheduled for energy conservation improvements using the financing option that is the most appropriate for the particular agency. To help ensure this opportunity becomes a success, Reliable Energy Trust Funds (RETF) could minimize any real or perceived risks, as well as support a champion for energy efficiency within each such agency knowledgeable in the ways of performance contracting and possibly having experience working with DOE's Federal Energy Management Program.

Recommendation GS-4

The District of Columbia Government should become a partner of EPA's Energy Star program to encourage agencies to procure Energy Star labeled products.



The Energy Star Rating is the US Department of Energy's stamp of approval for appliances and equipment with high energy efficiency.

Background

The District's Procurement Practices Act of 1985 requires the use of energy efficient products/equipment wherever practical. In an effort to meet this requirement, the District should enter into a voluntary partnership agreement with the Environmental Protection Agency (EPA) to participate in its Energy Star program, which

helps promote efficient products such as computers, monitors, copiers and lighting by labeling them with the Energy Star logo and educating users about the benefits of energy efficiency, thereby not only saving money but protecting the environment for future generations. The program provides tools to measure current energy performance and estimate the potential for improvement, as well as providing management resources and technical assistance. As EPA studies have shown, more than 50% of projected energy use and carbon dioxide emissions in 2010 will come from use of equipment purchased between 2000 and 2010. A number of years ago the District of Columbia was a member of EPA's Green Lights Program, the goal of which was to prevent pollution by encouraging public and private institutions to use cost-effective, energy efficient lighting technologies.

Choosing an energy efficient solution at purchase points during the 2000 to 2010 time frame has the potential to reduce the nation's energy bill by approximately 9%. According to EPA, many homeowners and businesses could use 30% less energy, without sacrificing services or comfort, by investing in energy efficiency. District procurement decision-makers need to be made aware of the benefits of Energy Star labeled products and of the need to work with the delivery chain to assure easy access and procurement of these products. An excellent example of such a partnership is the New York State Energy Research and Development Authority (NYSERDA). NYSERDA collaborated with EPA and DOE in November 1998 and is using the Energy Star logo, name and energy efficiency messages to promote the economic benefits of energy efficient purchases/investments. NYSERDA's strategy is to create real consumer demand through public awareness and marketing while building a substantial infrastructure to deliver Energy Star products and services.

Recommendation GS-5

Energy audits of all District Government-owned buildings should be conducted and owners of leased facilities in excess of 10,000 square feet should be required to conduct an energy audit prior to the signing or renewal of a lease.

Background

Energy audits are the precursor to energy conservation/consumption planning. In the 1980s, all DC Government buildings received an energy audit under the now-defunct federally funded Institutional Conservation Program. Each District Government-owned building that has not had a comprehensive energy audit completed within the past 10 years should be required to conduct an audit within the next two years. The Energy Conservation Plan that is generated from the audit should be incorporated in the agency's Energy Management Plan discussed in Recommendation GS-1. District Government-leased facilities in excess of 10,000 square feet should be required to conduct an audit and submit its Energy Conservation Plan the year before the lease renewal.

In both cases (owned and leased facilities), the building energy management plan could target as its ultimate objective attaining the Silver Level - the halfway mark of the rating scale - of the Leadership in Energy and Environmental Design (LEED) Program for Existing Buildings. The LEED Green Building Rating System is a proprietary program of the U.S. Green Building Council. It is a voluntary, consensus-based, market-driven building rating system based on existing, proven technology. It is a self-assessing system designed for rating new and existing commercial, institutional and high-rise residential buildings. Although the system is comprehensive in scope, it is simple in operation. Registration forms and instructions are on the Internet and support is available through the headquarters office located in the District. Alternatively, Energy Star criteria could be used to benchmark energy performance and obtain an Energy Star label for the building; Web-based support is available.

Residential Sector

Goals

- To reduce residential energy consumption by 1% per year;
- To improve residential energy program effectiveness;
- To ensure that market transformation benefits residential energy consumers.

Overview

Energy consumption in the Residential Sector, which includes single-family as well as multi-family dwelling units and public housing units, represents one-fifth of the aggregate energy consumption in the District of Columbia. According to the U.S. Census Bureau, there are 572,059 residents of the District of Columbia with 248,338 households, 274,845 housing units, and 131,111 households living in building structures with five or more units.

Given both national and DC energy consumption and expenditure trends, significant levels of poverty in the District of Columbia and anticipated increases in both population and associated demands for housing, electricity, natural gas and other energy sources, the goals, objectives, strategies and effectiveness of the Residential Sector are essential.

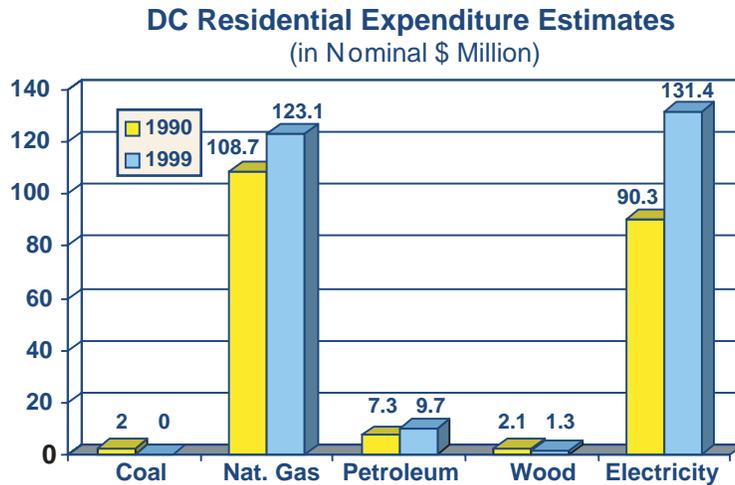
**19,365 families and
109,500 individuals in the
District of Columbia are
at or below the federal
poverty line**

Taking into account the projected increases in District of Columbia housing construction and renovation, notably in higher density multi-family dwellings, and projected increases in population through 2007, residential energy consumer demand, particularly for electricity and natural gas, is projected to increase.

Residential consumers are also projected to increase both the absolute aggregate amount of energy-related household expenditures and the proportion of household income spent on electricity, natural gas and other fuels. Based on data points for 1990 and 1999 (see Figures RS-1 and RS-2), it is clear that the Residential Sector consumes far more natural gas and electricity than any other fuel type.

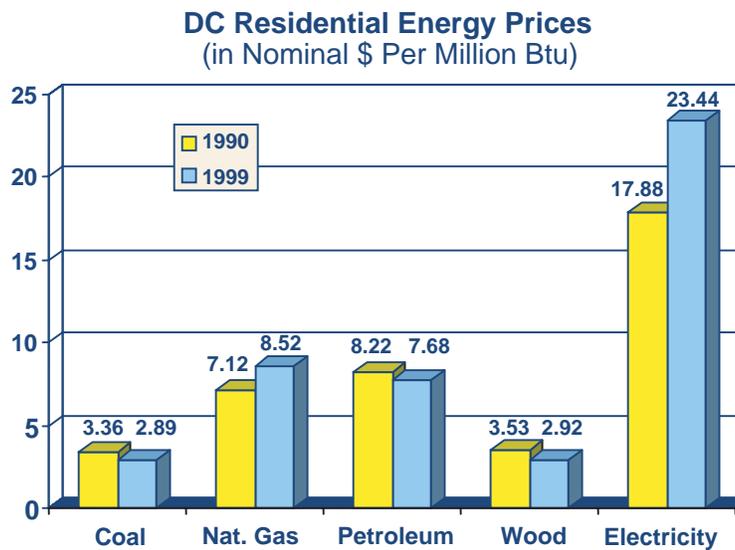
Moreover, according to the 2000 census data, 162,467 households (65.4%) used natural gas and 60,016 households (24.2%) use electricity for their primary heating source. Only 17,047 (6.9%) households use fuel oil, kerosene or other liquid fuel. All other fuel sources, including solar energy, are minimal.

In addition, 49.1% of the District's 274,845 total housing stock consist of five or more units and 30.9% have 20 or more units. Given that new residential housing construction is projected to increase more in the multi-family housing segment than for single-family, electricity and natural gas consumption is also likely to increase in the CEP III planning period.



Source: Energy Information Administration - State Energy Price and Expenditure Report 1999

Figure RS-1



Source: Energy Information Administration - State Energy Price and Expenditure Report 1999

Figure RS-2

The changing utility environment is expected to have a major effect on the Residential Sector. In 1995, the DC Public Service Commission initiated Formal Case No. 945 to investigate whether opening the retail electric market to competition would be in the best interest of the District and its ratepayers. In December 1998, the PSC requested Potomac Electric Power Company (PEPCO) to file a restructuring plan with stranded costs and unbundled rates studies. PEPCO filed a plan with the PSC in February 1999 to allow retail competition in its service territory in DC and suburban Maryland. The plan allowed retail choice in the District by January 2001, included an estimate of stranded costs and a method for recovery, proposed unbundled rates, and a rate freeze through January 2005. PEPCO planned to recoup its stranded costs by selling its DC power plants.

At the same time that the Commission was adjudicating the divestiture of PEPCO's plants, the DC Council adopted new legislation entitled "The Retail Electric Competition and Consumer Protection Act of 1999." As part of the implementation of that law, the Commission issued orders that allowed all residential and commercial electricity customers in DC, effective Jan. 1, 2001, to choose their generation and transmission supplier, while PEPCO continued to provide electric distribution services. Order No. 11796, issued by the Commission in September 2000, included licensing requirements for alternative electric generation and transmission suppliers. In December 2000, the PSC issued Order No. 11845, unbundling retail rates into three separate categories: generation, transmission and distribution. Unbundling allowed customers to compare prices among electricity suppliers and helped the Commission to determine "shopping credits" or "price to compare."

In light of these decisions to pursue competitive markets for electricity and natural gas, all DC residential consumers can now choose their electric generation and transmission supplier and commodity gas supplier. Although the future of the competitive marketplace is still not clear, the increased need for residential utility consumer education and information is at an all-time high.

Projected Increases in Population and Housing

From the 1970 through year 2000 census, aggregate District of Columbia residential population declined from 756,000 to 572,059, a loss of 24% in 30 years. However, demographers expect that the return to the city of middle-income residents, combined with foreign immigration and an increased birth rate among current DC residents will result in a steady increase in population.

Beginning in 1990, housing construction in the District of Columbia revived. According to the National Home Builders Association, some 12,000-15,000 new units of housing will be generated between 2000 and 2010, much of it to accommodate projected population increases. Moreover, the DC Government is committed to reducing the more than 26,000 units of vacant housing within its boundaries.

Consequently, the combined effect of both population and housing increases is likely to increase energy demand, particularly for electricity and natural gas. Although improvements in housing envelope construction and design, increases in appliance efficiency and weatherization and retrofitting of existing housing stock with energy conserving technology is likely to offset some of these increases, demand is projected to grow in the CEP III planning period.

The Increasing Challenge of Poverty in the Residential Sector

Although 19,365 families and 109,500 individuals in the District of Columbia are at or below the federal poverty line, 52,234 households are at or below 150% of the federal poverty level. As energy costs continue to rise - witness the winter of 2001 - many low-income households will be less able to pay their utility bills. The National Center for Appropriate Technology estimates that up to 30% of the annual incomes of low-income families and the elderly are spent on direct and indirect energy costs.

The National Center for Appropriate Technology estimates that up to 30% of the annual incomes of low-income families and the elderly are spent on direct and indirect energy costs.

In addition, the 2000 Census indicates that 21.8% of DC's population is at, or over, the age of 55, that 21.9% of the population between the ages of 21 and 64, and 42.5% of those over the age of 65 have identified disabilities. Along with the low-income households, these populations may be referred to as energy vulnerable populations (EVP).

According to files maintained by the Low-Income Home Energy Assistance Program, some 65% of applicants reapply annually for assistance in paying their energy bills. The severe winter of 2000/2001 and the economic downturn following the Sept. 11th disaster resulted in a record number of low-income households applying for energy assistance.

In addition to direct financial assistance in paying utility bills, low-income households frequently reside in single- or multi-family dwellings that are energy inefficient. Because many of these dwellings are not properly insulated, have poor plumbing and aging or malfunctioning appliances, energy is wasted and the household pays more for heating, cooling, hot water, cooking and refrigeration than it should. A key component to moderating, if not reducing, aggregate DC residential energy demand will be education, weatherization and financial assistance strategies that not only enable low-income and EVPs among DC households to afford rising energy costs but also to participate fully in overall energy conservation and efficiency strategies. Thus, EVPs require the support of the public sector, utilities and non-profit service providers to both make their homes energy efficient and to enhance their ability to control increasing energy costs.

Given the needs and challenges facing the Residential Sector in the District of Columbia, there are notable best practices in other states and localities that may be adapted to promote "Be Green or Pay Green" initiatives in Washington, DC. For example, the City of Portland, Oregon works with the HVAC industry to offer improved training to contractors providing heat pump and air-conditioning services to residential customers to address problems such as improper refrigerant charging, inadequate airflow across the coils, excessive duct leakage and other system problems. The city assists contractors in marketing their services and offers a rebate to each homeowner who receives full system services. Using Energy Star standards, the city also supports residential consumers in improving lighting efficiency and design in residential and multi-family new construction through simplified lighting guidelines and layouts, directing owners and renters to catalogs of energy efficient products in the local community, and providing a variety of marketing materials oriented to builders and the homebuying/remodeling public, such as point-of-purchase materials.

The State of California provides assistance to local governments in the design and use of Green Hotlines for residential energy consumers. These hotlines provide information and referral services to residential consumers seeking more energy efficient household appliances, construction materials, lighting, HVAC services and repairs.

To assist low-income residential consumers, the Boston Edison Settlement Board provides residential consumers with support to pay utility arrearages from \$1 to \$469 per participating household. All participants are enrolled in the company's Residential Aid Discount Program and are informed about energy saving programs and options.

Given the dynamics of the supply and demand of energy, it is incumbent for DCEO to apply its resources to "push" (force) and "pull" (assist) household energy efficiency strategies and tactics. Regulatory measures can be used to push households to conserve more energy, particularly electricity and natural gas. Financial incentives and special acknowledgments and awards are required to pull households into energy-efficiency and cost-savings modes of operation. Consequently, recommendations for the Residential Sector embody both "push and pull" approaches.

Residential Sector Recommendations

Recommendation RS-1

A Home Energy Rating System (HERS) should be established, along with a residential loan program meeting the requirements of Fannie Mae's Energy Efficiency Mortgage (EEM) and Energy Efficient Loan (EEL) programs, allowing homebuyers to more easily purchase energy efficient homes or improve existing ones.



Fannie Mae provides energy efficient mortgages to DC residents.

Background

Getting information on the relative energy efficiency of washers, dryers, heating systems, computers and cars is easy - just check the product efficiency label on the product. Ironically, when buying a home, the largest single purchase and by far the biggest source of energy bills for most families, consumers

do not have such a reference. A home energy rating, comparable to checking the miles per gallon sticker on a new car, fills that need. It is a standard measurement of a home's energy efficiency, allowing a homebuyer to easily compare the energy costs for the homes being considered. A homeowner who wants to upgrade the home's energy efficiency can use the energy rating to evaluate and pinpoint specific, cost-effective improvements. Home energy ratings are also used to finance energy improvements to a home at the time of sale or refinancing through the mortgage loan, and can also transform the new housing market by incorporating energy efficiency.

The premise of an energy efficient mortgage is simple: because an efficient home will be less expensive to operate, that additional monthly savings can be allocated toward the mortgage payment. This increased purchasing capability can thus help a buyer qualify to buy "more home," or can even make the difference in being able to qualify at all. An energy efficient loan can help pay for energy efficiency upgrades that could be used to reduce monthly utility bills on a house. Participating lenders would agree to set interest and qualifying rules for loans based on Fannie Mae standards. The programs would be available to all residential households, with income-based interest subsidies limited to those with no more than 100% of the DC median income, but eventually extending to households up to 150% of median income. Possibly supported by RETF funds, 300 to 500 families could be assisted in the first year, gradually increasing to 1,000 families by the third year. It would encourage the use of loans for green choices, including energy efficient building materials, lighting fixtures, water heaters, furnaces and boilers, and other appliances.

Home energy ratings and energy mortgages and loans provide an opportunity to increase homeownership while fostering housing that is more comfortable, of higher quality and more affordable to own. This program will have natural allies such as builders of Energy Star labeled homes, lenders that offer energy efficient mortgages, home energy raters that can verify the energy efficiency of a home, local contractors and home improvement providers.

Energy Rated Homes of America (EHRA) and the Residential Energy Services

Network (RESNET) are both sources of credible information on both HERS and EEMs, and could assist in the development of a rating system to DC circumstances, the training and certification of raters, and creating a campaign to promote ratings and EEM to real estate professionals. Ongoing affordable homeownership programs could promote home ratings as a means to lower homeownership costs.

Recommendation RS-2

The Residential Conservation Assistance Program (RCAP) for low-income residential households should be expanded to incorporate a new, comprehensive whole-house approach called Weatherization Plus that uses advanced, cost-effective technologies.



A Community Based Organization worker is preparing insulation to be installed in a resident's attic.

Background

A house is a dynamic structure, a system of interconnected components. The performance of each component affects the operation of many others. To successfully address the energy, comfort, health and safety needs of a dwelling, the house must be evaluated from top to bottom, including the building envelope, mechanical systems, base loads, indoor air quality and occupants, as well as the interaction of these components. This constitutes a whole-house approach to energy efficiency, known as Weatherization Plus.

Oak Ridge National Laboratory (ORNL) conducted a meta-evaluation in 2002, one of a series of updates of a thorough program evaluation conducted in 1990. Because of the increased number and effectiveness of the weatherization measures in use today, ORNL researchers concluded the average energy savings per dwelling has increased substantially in the last decade. This is due in large measure to Weatherization Plus, which incorporates advanced energy efficiency technologies into the traditional weatherization services provided to low-income households. Crews will be able to use enhanced energy audit tools to help evaluate whole-house energy savings opportunities, to employ advanced technologies such as aerosol duct sealing when these are deemed cost-effective, to identify potential health and safety problems by testing for gas and carbon monoxide leaks, and to install Energy Star rated replacement air conditioners in the homes of the disabled and the elderly to promote better health among these vulnerable populations.

The U.S. Department of Energy recently updated the regulations governing the Weatherization Assistance Program and added certain base-load measures, including refrigerator replacement, to the traditional heating and cooling measures installed under the program. Effective metering strategies and bulk refrigerator purchasing can make this program cost-beneficial, and

old units can be taken out of circulation in an environmentally responsible manner. Over the past decade, many refrigerator manufacturers have improved the energy efficiency of their products by a factor of three or more. Refrigerators manufactured after 1990 present lower peak loads to the grid and have much higher power factors than those manufactured in previous decades. Accordingly, replacing energy-wasteful refrigerators with new units can be very cost-effective, even when the older, wasteful units are still functional. A refrigerator replacement program can save electric energy, lower peak demand, improve power quality, and help the environment. It can also serve low-income households in a most visible and welcome way.

Through this approach, possibly funded by RETF, 500-1,000 low-income households per year could benefit. Energy savings and leverage of program funds would increase, emissions of pollutants would decrease, and other benefits, such as lead poisoning risk assessment, disaster mitigation, and consumer education would be delivered.

Recommendation RS-3

Local tax incentives should be established to encourage investment in residential renewable energy systems for both single- and multi-family dwellings.



The solar powered street sign was placed in a residential neighborhood to encourage the use of alternative energy.

Background

In order to accelerate the use of renewable energy sources and technologies, thereby improving the air, generating economic activity and reducing electric demand, there are a variety of financial incentives that can be deployed for individuals who invest in, or purchase, solar, wind, geothermal, fuel cells and other renewable energy equipment for residential applications. These incentives include income tax credits, property tax exemptions and sales tax exemptions, and should include provisions for net metering of the equipment, thereby providing a double benefit to the homeowner. This recommendation might also include tying in promotions with local home improvement outlets to promote the purchase of renewables, and possibly include a rebate to generate more interest. Some East Coast stores are selling photovoltaic systems on an installed basis in partnership with a Delaware solar manufacturer, along with financing options.

The income tax credit would be based on a percentage of the cost of equipment and installation, and capped at an established price per watt of rated capacity. Property tax exemptions ensure property owners that their real

property taxes will not increase as a result of the installation of a solar or other renewable energy system; the amount of the exemption would be equal to the increase in assessed value attributable to the energy system. The sales tax exemption would apply to renewable energy systems whether or not they are connected to the grid. An eligibility limit on system capacity would be advisable; DC Law 13-107 allows residential and commercial utility customers in the District of Columbia to net meter renewables, fuel cells, and microturbines up to 100 kw in capacity.

Electric utilities in many states are required to offer net metering and billing programs. These programs allow owners of qualifying renewable energy power systems to connect their systems to an electric utility. The basic idea is to allow the electric utility's customers to offset their electricity consumption with a qualifying generator. The customer is only billed for the net amount of electricity that is consumed over the billing cycle. Thus the system owner effectively obtains the same value for the output from the renewable energy system as he/she pays for electricity from the utility, up to the point where excess power is produced. Any excess power produced may be bought by the utility at a rate determined by the Public Service Commission.

Recommendation RS-4

A grants program for residential electric customers should be established to help subsidize the incremental cost of green power.

Background

Green power is electricity that is generated from resources such as solar, wind, geothermal, biomass and low-impact hydro facilities. Conventional electricity generation, based on the combustion of fossil fuels, is the nation's single largest industrial source of air pollution. The increasing availability of green power enables electricity customers to accelerate installation of renewable energy technologies. As more green power sources are developed - displacing conventional generation - the overall environmental impacts associated with electricity generation will be significantly reduced.

Grant programs are offered in some states to encourage the use and development of renewable energy technologies. Most of these programs offer support for a broad range of renewable energy technologies, while some focus on promoting a particular type of renewable energy technology.

As a result of the restructuring of the District's electric industry, customers are being encouraged to reduce their electric bills by shopping for an energy supplier. But what many residents don't know is that they can also choose to decrease their impact on the environment by purchasing cleaner, or green, electricity. In some cases, green energy can cost more than what is being paid for now. This program, which could be funded by RETF, would encourage residential customers to add renewable energy to their energy supply mix, allowing them to be personally responsible for eliminating hundreds of pounds of pollutants from our air, water and soil.

Recommendation RS-5

A catalog of resources should be compiled to assist in identifying and accessing programs that offer incentives for the installation of energy efficiency measures in public housing.

Background

The District of Columbia Housing Authority manages 10,460 public housing apartments, many of which offer the potential for considerable improvement in energy performance. With public housing typically in the quandary of having high energy costs but few resources to do anything about it, there is a great need address this issue. According to the U.S. Department of Housing and Urban Development (HUD), a 15% reduction in fuel consumption could save as much as \$128 per unit annually. Space heating, which accounts for 43% of annual consumption per unit, provides a significant opportunity for energy savings.

HUD has determined that there is a need for requirements and incentives to encourage lower energy consumption, incentives to use innovative funding mechanisms and reduce utility rates, and technical assistance to increase the application of cost-effective energy conservation. This is especially true in the era of deregulation of the electric and natural gas utility industries, which present a variety of challenges as well as opportunities.

Energy efficiency and conservation are continuous processes. There always will be opportunities to become more energy efficient as new policies and technologies are developed. Because energy costs account for such a large portion of DCHA's operating expenses, cutting waste can significantly reduce its operating expenses through cost-effective conservation improvements and an aggressive energy management plan. Elements of energy management may include energy procurement, utility allowances, equipment, efficiency, operations and maintenance, tracking, and staff/resident education. The EPA Energy Star program addresses the cost-effectiveness of energy efficient products.

One of the barriers to implementing such a program may be a lack of access to relevant information. NYSERDA had a catalog prepared entitled "Resources for Energy Efficiency Rehabilitation of Multi-Family Publicly Assisted Housing," essentially a guide for public housing officials, managers, and technical assistance providers that outlined incentives to incorporating energy efficiency in the rehabilitation or new construction of public housing. It addresses such issues as sources of technical assistance, general capital improvement financing, energy efficiency incentives and financing, and post-installation incentives and financing. A similar effort, funded by RETF, could assist DC housing officials in conserving costly energy resources, free up funds that might be better used elsewhere in their operations, improve the comfort level and livability for residents, have a positive impact on the environment, and promote economic activity.

Commercial/Industrial Sector

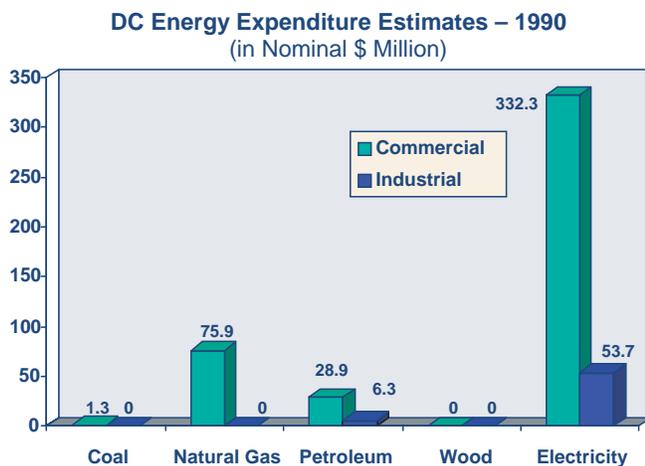
Goals

- To reduce commercial/industrial energy consumption by 1% per year;
- To improve commercial/industrial energy program effectiveness;
- To ensure that market transformation benefits commercial/industrial energy consumers.

Overview

In DCEO's first Comprehensive Energy Plan, particular attention was focused on the Commercial/Industrial Sector and establishing energy conservation targets for these end-users. Primary emphasis was placed on increased training for construction industry professionals, keeping the District's building codes updated and promoting resource recovery programs. There has been progress, but a great deal more is needed to further curb the growth in costs and usage. These sectors remain as prime targets for energy conservation initiatives since the Commercial Sector is experiencing growth and the Industrial Sector buildings are aging. The procurement of Energy Star labeled products and deployment of green building design concepts/materials will need to become the rule vs. the exception if these sectors are going to make significant improvements in energy use and expenditures. Influencing the Commercial/Industrial Sector will be a challenge, especially if no incentives are offered that encourage and promote less use and more conservation measures.

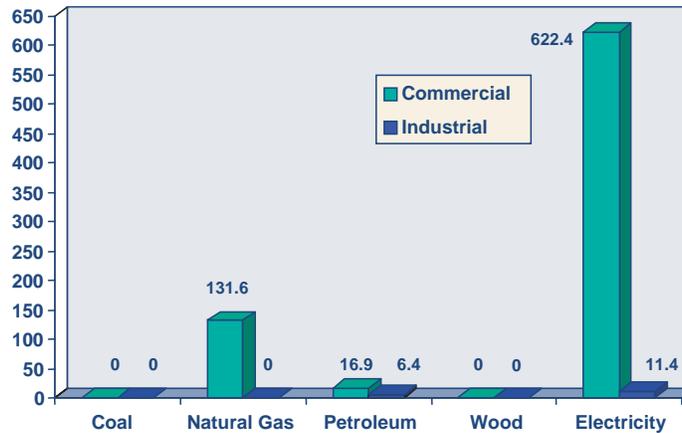
As can be seen in Figures CI-1 and CI-2, the Commercial/Industrial Sector accounts for 65% of the total usage in the District of Columbia, with the Commercial Sector being the single largest user of energy. Electricity consumption is the dominant energy source for the Commercial/Industrial Sector, representing 80% of the dollars spent on all energy sources. While Industrial Sector expenditures for electricity have declined dramatically over the 10-year period, Commercial Sector expenditures have almost doubled.



Source: Energy Information Administration - State Energy Price and Expenditure Report 1999

Figure CI-1

DC Energy Expenditure Estimates – 1999
(in Nominal \$ Million)



Source: Energy Information Administration - State Energy Price and Expenditure Report 1999

Figure CI-2

The District witnessed unprecedented growth in commercial office space over the past 17 years. Based upon data provided by the DC Marketing Center, more than 42 million square feet of office space has been added to the District's commercial real estate inventory, bringing the total to 110 million square feet. In 2002 alone, 3.7 million square feet of commercial office space was added, 2.7 million square feet are scheduled for 2003 and 3.7 million square feet are already planned for 2004.

Table CI-1 identifies the types of businesses, the number of establishments and the work force size for the businesses that comprised the Commercial/Industrial Sector in 1997.

District of Columbia Businesses, 1997

Category	Establishments	Employees
Utilities	33	3,250
Construction	310	6,356
Manufacturing	200	2,858
Wholesale Trade	348	5,008
Retail Trade	2,075	19,608
Transportation & Warehousing	215	3,356
Information	632	23,787
Finance & Insurance	908	16,481
Real Estate, Rental & Leasing	934	7,725
Professional, Scientific & Technical Services	4,023	68,168
Management of Companies & Enterprises	241	7,230
Administrative Support, Waste Management & Remediation Services	1,096	27,970
Educational Services	280	3,652
Health Care & Social Assistance	2,119	59,529
Arts, Entertainment & Recreation	235	2,249
Accommodations & Food Services	1,700	42,650
Other Services (except Public Administration)	2,924	42,634
Auxiliary Establishments	74	4,901
Totals	18,347	347,412

Source: U.S. Census Bureau

Table CI-1

There are not many businesses that make up the Industrial Sector, and little to no growth is anticipated in this group. Nevertheless, energy usage is expected to increase as production equipment ages and energy conservation measures for older structures and equipment become more cost prohibitive. On the other hand, four business categories represent 52% of the total establishments and 61% of the employees in the service areas that include:

- Professional, scientific and technical services;
- Accommodations and food services;
- Health care and social assistance;
- Other services.

At the national and District level, these are all growth business areas that increase the demand for energy resources. The pattern of a service-oriented economy in the District is not expected to change and will remain the case, driven largely by the addition of more office buildings, hotels and apartments already on the drawing boards. The DC Marketing Center promotes the District of Columbia as "Your Gateway to the World" because it is a center of world power. Nearly every country operates an embassy and trade office in the District, global financial institutions have headquarters here, three international airports are located close by and there are excellent universities that boast the best curricula in foreign trade and international studies. There are all indications that Commercial Sector growth will be significant and the demand for energy, specifically electricity, will soar.

One of the key metrics used by the DOE's Energy Information Administration is intensity of energy use, the amount of energy consumed per unit of service or activity. The most commonly used measure of energy intensity is energy consumption per square foot. According to EIA, commercial establishments use 90.5 Btu per square foot but in the health care, food service/sales and hospitality industries, energy intensity is higher. Since the largest business segments in the District are in one of these categories, even greater emphasis needs to be placed on energy consumption and efficiency.

Needs and Challenges of the Commercial/Industrial Sector

From 1989 to 1999, the dollars spent on electricity by the Commercial/Industrial Sector went up by 35%, while the amount spent on natural gas rose by 57%. The growth forecast in construction implies that double-digit increases in both of these energy sources will continue over the planning period if "business as usual" energy conservation and consumption approaches are followed. This sector is the largest user of electricity and natural gas in the District of Columbia and, as such, represents a major opportunity for helping the District achieve a sustainable energy position over

the long term. Education and motivation are the key requirements, and support and oversight are the key challenges to achieving a sustainable energy footing. Building professionals, tenants and property managers of owned/leased space need to be well-versed on the advantages of energy conservation and usage in order to become proponents of such measures. Building developers/owners and large corporations need to be motivated to renovate, construct and maintain energy efficient buildings and to adhere to energy-related building codes and products. At present, DCEO does not have the resources (funds or staffing) to provide support and oversight to 18,000 establishments that should become active, committed partners to implementing programs that conserve energy and reduce consumption. Consequently, the recommendations that follow are focused on the areas where DCEO can use existing resources to achieve the greatest impact.

Commercial/Industrial Sector Recommendations

Recommendation CI-1

Training should be provided to the members of the building code community (designers, builders, plan reviewers and inspectors) to ensure awareness, compliance and enforcement of the latest provisions of the energy codes.



DC Department of Consumer and Regulatory Affairs oversees the creation and updating of the District's energy building code.

Background

Energy codes are proven to be one of the most cost-effective means by which to effect environmental savings, provide energy efficiency provisions that would be difficult or impossible to capture after construction, and help save energy and stretch present energy resources into the future. Builders, architects and engineers gain from having a single set of rules and sophisticated yet simple-to-use software for energy code compliance, and consumers will appreciate safer, more comfortable and more efficient buildings in which to live and work.

The Building Code Advisory Committee advises the Department of Consumer and Regulatory Affairs and the Mayor on methods that keep the DC Energy Conservation Code current with state-of-the-art practices. The Energy Conservation Code, which forms part of the Construction Codes, establishes minimum prescriptive and performance-based regulations for the design of energy efficient buildings for public assembly, educational, business, mercantile, institutional, storage and residential occupancies, as well as those portions of factory and industrial occupancies designed primarily for human

occupancy. The code addresses the design of building envelopes and the selection and installation of mechanical, hot water, electrical distribution and illumination systems and equipment for the effective use of energy in new and renovated buildings.

The current code is based on the 1995 Model Energy Code for residential construction and ASHRAE/IESNA Standard 90.1-1989 for commercial construction. After a six-year effort to make building codes consistent throughout the United States, the nation's three regional model code-writing organizations (BOCA, ICBO and SBCCI) have developed a national code package - the International Construction Codes - that includes 11 compatible codes that complement each other. Supplements are issued annually, and new editions are published at three-year intervals. The DC Building Code Advisory Committee has reviewed the 2000 ICC family of codes, of which the International Energy Conservation Code is a part, for adoption by the District of Columbia. Chief among scope changes is the updating of interior lighting power allowances to be equivalent to values in ASHRAE/IESNA Standard 90.1-1999, and greater flexibility that will encourage innovative design and construction techniques. Benefits include ready availability of training and other support materials, as well as regular updating to reflect new technologies.

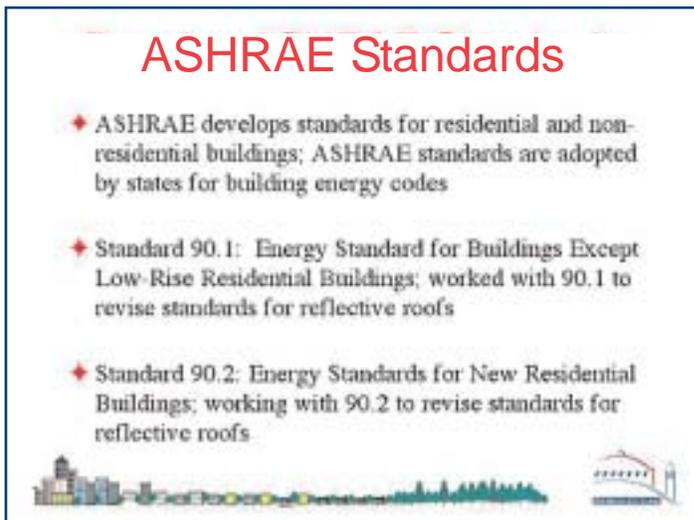
Working with current energy conservation codes is crucial to pushing adaptation of conservation measures and practices. Without an element of frequent monitoring to assure adherence, enforcement becomes difficult at best. The ideal time to begin the enforcement process is the building design stage and before construction starts. The DC Energy Office has a proven track record in obtaining code-related grants for DOE under the auspices of the State Energy Program. The cities of Chicago and Dallas, both with some funding from DOE, offer technical assistance and code training to firms to facilitate code adherence. Guidelines should be developed to also facilitate adherence to building codes, and could be modeled after those used by New York's Department of Design and Construction.

Recommendation CI-2

Tax incentives and attractive loan rates should be offered for new and existing buildings that qualify at the Silver or above Leadership in Energy and Environmental Design (LEED) level or buildings that earn the Energy Star building performance label, and free energy audits should be provided to small businesses and rebates offered for using alternative energy sources.

Background

Although some commercial establishments are already energy conscious citizens and adhere to energy conservation measures and practices, others are not as conscientious, particularly small business with less than 20 employees or \$1 million in annual sales. Tax incentives and lower than prevailing loan interest rates reward the conscientious for their sound energy position and practices and motivate others to action. A "best practice" policy in the incentive area is the one established by the State of Wisconsin. Wisconsin specified Energy Star as the commercial delivery platform for the state's public benefit programs. Additionally, energy related tax incentives that provide either exemptions or reductions on tax obligations are offered in seven states (Hawaii, Indiana, Maryland, Montana, New York, Oregon and South Carolina). While many of these do not focus on the Commercial/Industrial



Sector, two are applicable to this sector. The states of New York and Oregon offer incentives for businesses. New York allows developers of commercial and apartment buildings to receive a tax credit of up to \$3.75 per square foot for interior energy-related work and \$7.50 per square foot

for exterior energy-related work. Oregon offers businesses a 35% tax credit over five years for investments in energy conservation, renewable resources, recycling and alternative fuels, as well as a one-time cash payment through investor-owned utilities. In addition to tax incentives, 16 states offer a grant or loan program, and six of these states offer the programs described below for commercial and industrial firms. Recommended state models for incentives for energy efficiency include the following that were identified in the Energy Project of the National Conference of State Legislatures:

- California provides grants for re-coating roofs, replacing commercial refrigerators and HVAC systems and installing computer energy management control systems;
- Missouri offers grants to small businesses and energy-using sectors for design and renovation/construction conservation projects;
- Ohio provides loans at below-market rates for energy and solid waste conversion or thermal efficiency improvements;

- Oregon's low interest rate, long-term loans cover conservation, renewable energy resources, alternative fuels and recycling projects. Of particular note is a loan made for the construction of a small office building in Portland that features use of recycled and environmentally friendly materials and is at least 25% more efficient than the building code requires;
- Texas' LoanSTAR Program ("Saving Taxes and Resources") monitors energy use and recommends to building owners energy-saving retrofits. Funding for this program is provided by the U.S. DOE;
- Arkansas passed a law in that allows municipalities or counties to issue bonds to help provide financing for facility improvements to reduce energy consumption or make use of renewable energy resources. Commercial, industrial, residential and agricultural entities are eligible for this facility bond-financing program. The bonds are exempt from all state, county, municipal and school district taxes.

The basis for tax incentives, grants or any low interest loans could be either the Energy Star national building energy performance rating system or the LEED certification system. EPA introduced the national building energy performance rating system in 1999. The rating system compares the energy performance of an individual building against the national stock of similar buildings. By the end of year 2000, 330 office buildings had earned the Energy Star building performance label out of the 2,500 benchmarked. In 2001, EPA introduced an Energy Star measure for the industrial sector that consists of energy and related productivity benchmarks for industrial plant performance. The LEED Green Building Rating System is a proprietary program of the U.S. Green Building Council. It is a voluntary, consensus-based, market-driven building rating system that considers proven, vs. evolving, technology. It is a self-assessing system for new and existing buildings and though comprehensive in scope, it is simple in operation. Registration, assessment forms and instructions are all available on the Internet and support is available through the headquarters office located in the District of Columbia.

Either one of these rating systems could be used as the basis for determining business participation in District-offered energy incentives. Lighting could be a targeted measure using case studies of successful lighting retrofits offered by lighting designers and/or installers, and marketed through local small business associations. Consideration could also be given to including extra incentives for using energy efficiency measures in capital projects that qualify for the District's Enterprise Zone incentive package.

With more than 16,000 businesses of less than 20 employees in the District of Columbia, DCEO could also assist these small businesses by providing free energy audits, encourage participation in DOE's Energy Star for Small Business program, and making available rebates for the installation of alternative energy systems. These measures could be funded through the RETF.

Recommendation CI-3

Partnerships with key commercial and industrial associations and support groups should be forged to collectively sponsor educational seminars/workshops, provide and disseminate energy information, promote the benefits of energy conservation and efficiency, and provide assistance to local businesses to develop markets for recycled products.

Background

Many commercial and industrial associations and support groups have offices located in the District of Columbia. DCEO should establish partnerships at the local and national level. At the local level, several associations are recommended: the Washington Building Congress (WBC), the District of Columbia Building Industry Association (DCBIA), and the Apartment and Office Building Association (AOBA). WBC is a group of companies and individuals dedicated to high standards of building design and construction, has in excess of 900 members, and is the largest association representing all facets of real estate, design and construction within the greater Washington area. DCBIA is a non-profit trade association representing the commercial and residential real estate industry in DC; among its membership are commercial developers, architects, engineers, general contractors, interior designers, utilities and other real estate-related businesses. AOBA is composed of organizations that own and/or manage commercial and multi-family residential properties, as well as companies who provide products and services to the real estate industry. Last, but most obvious, is collaborating with the local utility companies (PEPCO and Washington Gas).

Working with these various partners, DCEO could offer energy related educational workshops and seminars focusing on the need for conservation measures.

It is also important for DCEO to collaborate with national groups such as the National Association of Real Estate Investment Trusts (NAREIT), the Society of Industrial and Office Realtors (SIOR), and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), all of which promote Energy Star products to their members. Another important national affiliation is the National Institute of Building Sciences (NIBS). Congress, recognizing the need for an

organization that could serve as an interface between government and the private sector, authorized NIBS under the Housing and Community Act of 1974. NIBS's primarily focuses on improving the building regulatory environment, facilitating the introduction of new and existing products and

technology into the building process and disseminating nationally recognized technical and regulatory information. It is headquartered in the District and is directed by a 21-member Board of Directors (15 elected and six appointed by the U.S. President). If lobbying for a board position is not plausible, consideration should be given to collaborating on a special project that brings the federal government and the commercial sector together for an energy forum.

Working with these various partners, DCEO could offer energy related educational workshops and seminars focusing on the need for conservation measures, guidelines for conducting energy audits, and technical assistance in developing energy plans. The partnerships also could make available printed information (such as case studies) and a hotline. DCEO could assume the lead role for this effort and consideration also could be given to marketing Energy Star labeled building equipment/materials and green building design concepts using endorsements from EPA and DOE.

In addition, DCEO should expand its website (www.energy.dc.gov) by providing links to key energy related research, building codes, energy standards (LEED, EPA Energy Star, etc.), associations and financing options for conservation projects. The website should have a "chat room" capability for energy queries and the sharing of best practices/lessons learned. DCEO can look to the U.S. Department of Energy or other sources for potential underwriting of the website development.

Using recycled materials in manufacturing usually requires much less energy than virgin material, and an added benefit is a reduction in waste that extends the life of landfills and lowers associated greenhouse gas emissions. DCEO should work with the Department of Public Works to assist in spurring recycling programs in private-sector buildings throughout the city. In 2001, Portland's recycling program was rated as the highest of any of the 30 largest cities. The District's program for commercial and industrial customers could be patterned after Portland's plan.

Institutional Sector

Goals

- To reduce institutional energy consumption by 1% per year;
- To improve institutional energy program effectiveness;
- To ensure that market transformation benefits institutional energy consumers.

Overview

The Institutional Sector includes schools, hospitals, institutions of higher learning, non-profit organizations, religious institutions and nursing homes.



DC Children's Hospital will be one of several hospitals that could benefit from energy efficiency programs to reduce consumption.

The types of uses span office space, classrooms, medical uses, laboratories, food preparation and public assembly, just to name a few.

These institutions own, lease, rent or otherwise manage buildings and make many of the decisions affecting energy usage. In addition, many of these institutions own or

manage one or more motor vehicles. Consequently, many of the recommendations presented in the Commercial, District Government and Transportation Sectors related to these kinds of institutional energy decisions are also applicable to the Institutional Sector.

Education, health care, faith and non-profit institutions will undoubtedly experience changes in their missions, operations and clientele during the period 2002-2007, and this will have an impact on energy costs and consumption. For example, of the largest institutions in the District of Columbia is the DC Public School system (DCPS). According to the National Association of State Energy Officials' report, *Energy Efficiency in Our Schools*, relatively high levels of school project financing and program funding have been reported by state and territory energy offices. In 2000, states reported spending \$2,062,285 in federal funds for energy efficient schools, \$66,757,521 in state funds (approximately \$48 million in state general funds and \$18 million in state oil overcharge funds) and \$170,130,466 in private sector funds. Much of this money supported energy efficient building renovation and construction, as well as the purchase of energy efficient office equipment, lighting fixtures and HVAC systems.

Serving more than 70,000 elementary, middle and high school students in 146 schools, the DCPS owns and manages nearly 200 buildings and their associated heating, cooling, lighting, hot water and cooking facilities. In December 2000, the DC Board of Education approved a facility master plan to rebuild and update the District's public schools. The plan requires the modernization of 10 schools annually over a 10- to 15-year period. Based on this plan, a \$1.3 billion capital budget to modernize the public schools was approved in June 2001. Some of these schools will be completely renovated, others replaced with new structures. New HVAC, lighting, laboratory, cafeteria and other facilities will be installed in both new and modernized buildings. The DCPS capital improvement plan provides significant opportunity to include Energy Star rated appliances, equipment and building materials.

In addition, the DC Hospital Association indicates that its 18 member hospitals are experiencing significant increases in operating costs and are actively

seeking effective means of addressing the energy components of those costs. New building construction provides some opportunity to install energy efficient facilities and materials, but renovation of existing buildings offer the most likely candidates when offices, laboratories, hospital rooms, cafeterias and auditorium equipment, lighting and HVAC systems are replaced.

The Washington Council on Agencies (WCA), the largest membership organization of non-profit organizations in the metropolitan area, is encouraging its 930 members (more than 450 in the District of Columbia) to energy-wise decisions regarding building management, equipment and appliances. These non-profits represent a variety of constituents and may own, lease or rent the facilities they use.

WCA reports that the number of non-profit organizations in the District of Columbia increases about 2% annually. This trend will result in the addition of some 45-50 new non-profit organizations in the District of Columbia between 2003 and 2007, and will be seeking suitable space to own, rent or lease and appropriate equipment and appliances to purchase or lease. These decisions provide significant opportunity for DCEO and other government agencies to encourage choices that make sense not only in the short term, but the long term as well.

Although there are more than 100 colleges and universities licensed to operate in the District of Columbia, the six largest - George Washington University, American University, Howard University, the University of the District of Columbia, Catholic University and Georgetown University - have all experienced growth in new building construction and renovation and the purchase of computer, laboratory, heating, cooling, lighting and cooking equipment. Serving more than 80,000 students, these institutions are seeking effective means of controlling energy costs by pursuing energy efficient building design and equipment.

As indicated in the Commercial Sector analysis, one of the key metrics used by EIA is intensity of energy use, the amount of energy consumed per unit of service or activity, with the most commonly used measure being Btu per square foot. EIA data indicate that schools and hospitals and the food service/sales sectors of these facilities use well over the average of 90.5 Btu per square foot. Thus, there are significant opportunities for improving energy efficiency in these institutions, while recognizing that some uses, by their very nature, will consume more energy than others.

Schools, hospitals, non-profit organizations and faith institutions all report significant increases in electricity, natural gas and other energy costs, and all indicate plans to improve the efficiency of buildings, appliances and equipment. Many are involved in or are planning major renovations to buildings or additions, or replacements of existing buildings.

With this in mind, numerous opportunities exist to identify and to adapt exemplary energy efficiency program innovations that will reduce operating costs and free up funds for carrying out the primary mission of the institution. For example, Montana's E=mc² Technical Assistance Program for Public School Districts and Health Care Facilities supports building system improvements through state Department of Environmental Quality grants up to 50% of Preliminary Building Assessment (PBA) costs. PBAs provide needed information on energy savings and cost estimates of certain building improvements and address upcoming equipment replacement needs, whether or not the HVAC system is operating at design specifications, and the potential benefits of "recommissioning" the existing system. After the PBA, school district personnel and health care facility planners can prioritize energy improvements and make informed maintenance and upgrade decisions.

Numerous opportunities exist to identify and to adapt exemplary energy efficiency program innovations.

Another best practice opportunity for schools is the California Bright Schools Program. The California Energy Commission offers specific assistance to school officials in selecting cost-effective and energy efficient systems, particularly in school modernization, deferred maintenance and energy audits, development of feasibility studies, review of designs for building construction or renovation, and assistance with equipment selection with installation. The Commission emphasizes Green Power products and services and the EPA Energy Star standards in its support of school district energy decisions.

A number of colleges and universities with multiple buildings on campus generally do not receive utility bills for each building, and have traditionally not found it cost-effective to submeter the campus to collect such data. However, many colleges and universities have discovered that submetering can result in better energy management, which translates into cost savings. Thus, many have turned to submetering all buildings to better monitor the use of electricity, natural gas, steam and chilled water, thus helping identify small problems before they become large, expensive ones.

Portland, Oregon provides a "Green Hotline" to all energy consumers as a central point of energy efficiency information and referrals. The staff managing a toll-free number is trained to answer questions about green products and services, provide information over the phone, by e-mail or through the mail, provide linkage to other services, supply information on qualified contractors and participating retailers, and market the services that the city and other providers have available. The Green Hotline is also an important access point to the Efficient Product Catalog and other city-sponsored energy efficiency services and resources.

Institutional Sector Recommendations

Recommendation IS-1

The Institutional Conservation Program, which focused on energy efficiency in schools and hospitals by providing matching grants to schools and hospitals for engineering, acquisition and installation of energy efficient capital improvements, should be resurrected.

Background

The Institutional Conservation Program (ICP), originally created by the National Energy Conservation Act of 1978, proved highly popular and successful, providing matching federal grants to public and private nonprofit institutions for energy analyses, which identified potential energy saving opportunities, and for cost-effective retrofits identified. The energy analyses, called Technical Assistance (TA studies), provided the institution with a comprehensive planning document that identifies operations and maintenance changes that have an immediate payback, and energy conservation measures that have a longer payback. These studies were completed by a professional engineer/architect. Energy Conservation Measures (ECM) grants provided for the design, acquisition, and installation of energy conservation measures identified and recommended in the TA.

Although Congress eliminated direct funding to the ICP in 1996, it could still help institutions address problems caused by limited capital budgets, rising energy usage and the need to hold down operation costs while maintaining essential services. It should be funded through the RETF and matched with monies provided by corporate participants, foundations and trade associations based in the District of Columbia. Using Energy Star criteria, managers and officials could implement dozens of cost-effective and energy efficient design and equipment choices yearly as they modernize their facilities.

This program could be affiliated with Rebuild America, a national network of public-private partnerships engaged in making energy efficiency improvements to existing buildings, thus supporting improvements in the learning and health care environments of our schools and hospitals.

Recommendation IS-2

A Green Faith drive should be launched, aimed at reducing energy usage in faith congregations in the District of Columbia.

Background

Seed-funded by the RETF and supplemented with funds raised by religious congregations in the District, Green Faith would use EPA's Energy Star program to better plan and implement building construction, expansion, renovation, equipment replacement, maintenance and operation so as to use

the Earth's precious natural resources more wisely, help prevent pollution and - last but not least - save money.

EPA's Energy Star Program for Congregations offers no-cost technical assistance to reduce energy costs and to make energy efficient and environmentally sensitive decisions. It provides a toll-free hotline and technical literature to congregations interested in recovering money that would otherwise be spent on wasted energy.

Recommendation IS-3

A conference for the Institutional Sector should be convened whose objectives would include both an identification of energy efficient best practices and the cooperative development of collective institutional strategies for achieving energy efficiency.

Background

Given the needs and challenges of the Institutional Sector, there are many opportunities for resource management that could be shared and implemented based on exemplary programs and strategies. These best practices would be based on:

- Energy Star guidelines for appliances such as commercial solid door refrigerators and freezers, leading to energy savings of 46% with a 1.3 year payback;
- Energy Star office equipment such as fax machines that use 25% less energy in sleep mode than in standby mode, or copiers that automatically turn off after a period of inactivity reducing energy use by 60%, or high-speed copiers that include a duplexing unit set to automatically make double-sided copies to reduce paper costs by \$60 monthly;
- Energy Star lighting that would reduce electricity consumption by more than 20% annually.

A series of objectives are associated with the conference, including the development of more conscious and effective networks among components of the Institutional Sector, as well as preparing for and managing energy-related emergencies in the District and the metropolitan area.

Transportation Sector

Goals

- To reduce transportation energy consumption by 1% per year;
- To improve transportation energy program effectiveness and system efficiency.

Overview

In 1986, the first District of Columbia Comprehensive Energy Plan was ahead of the area transportation community in describing the role of transportation in the District's energy profile. Many of the recommendations it contained - transit improvements, alternative fuels, people-powered alternatives, variable work schedules and ridesharing - are still valid.

DC AFV Fleets	
Department of Public Works:	150
WMATA:	164
Water and Sewer Authority:	40
Housing Authority:	3
Total DC AFV Fleets	357

The District of Columbia has made significant strides implementing petroleum-reducing and energy-saving transportation initiatives. Major steps to reduce the

consumption of petroleum and save energy through the use of alternative fuel vehicles (AFV), the purchase of AFV buses and building AFV infrastructure have been taken. The District Department of Transportation (DDOT) has made significant strides in expanding bikeways, introducing Intelligent Transportation Systems (ITS), reducing roadway impediments and improving DC transportation oversight. The Washington metropolitan region is a national leader in transit with its extensive, clean and widely used Metrorail subway system.

AFVs have been incorporated in cities throughout the United States. Atlanta and Salt Lake City have made significant investments in natural gas-powered buses, and Chattanooga operates a fleet of electric buses in its downtown hub. Atlanta is also a leader in applying the latest ITS to its transit system and roadways. The northern Kentucky suburbs of Cincinnati, along with that city, are early adopters of the new 511 universal traveler information telephone number. Portland is a model city for a variety of alternatives to the single-driver commuting vehicle, including bikeways, surface electric transit and people-friendly buses.

U.S. Census Bureau data reveal that the number of DC residents driving to work dropped by 6.5% from 1990 to 2000. Carpooling declined by 28% and resident use of public transit (including taxicabs) dropped almost 29%. Ten percent fewer residents walked to work or worked from their homes.

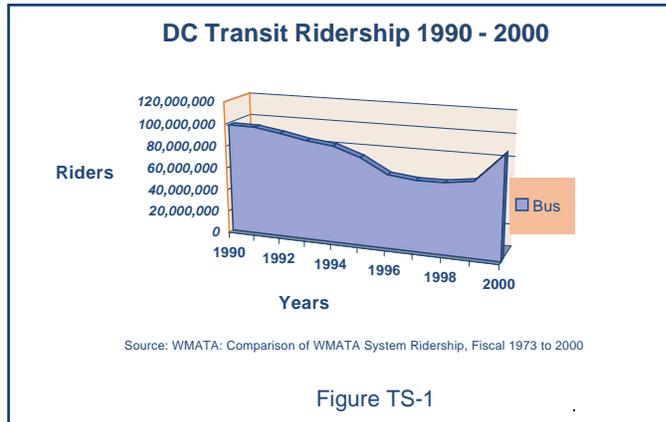


Figure TS-1

During this period, the number of riders on Metrorail increased significantly. Metrorail ridership in August 2001 was 16,179,397 customer trips - an 8.8% increase over August 2000 and a 31% increase from August 1996. As can be seen in Figure TS-1, annual Metrobus

ridership diminished in the early 1990s and then began to increase in 1998, reaching 145,340,000 customer trips during fiscal year 2001. The previous watermark year was 1991, with 140,391,000 riders. The Washington Metropolitan Area Transit Authority (WMATA) attributes these increases to new Metro stations along the Green line, use of the SmarTrip card, a Metro Opens Doors program encouraging off-peak ridership, as well as the economy, highway congestion and high fuel prices.

While motor gasoline sales dropped and distillate sales increased, the U.S. Bureau of Transportation's Roadway Congestion Index shows that the city's overall traffic congestion grew by 34% from 1982 to 1997. Federal Highway Administration data shows that in 1999 there were more than 3.4 billion vehicle miles traveled (VMT) in the District, with a per capita VMT of 6,671. This is not surprising when one considers that the District has the highest percentage of lane miles per square mile of any jurisdiction in the nation - 2,673 lane miles per square mile of land. It also contains one of the highest population densities in the nation, with 9,378 persons per square mile of land area. Figure TS-2 shows the various modes of commuting to work.

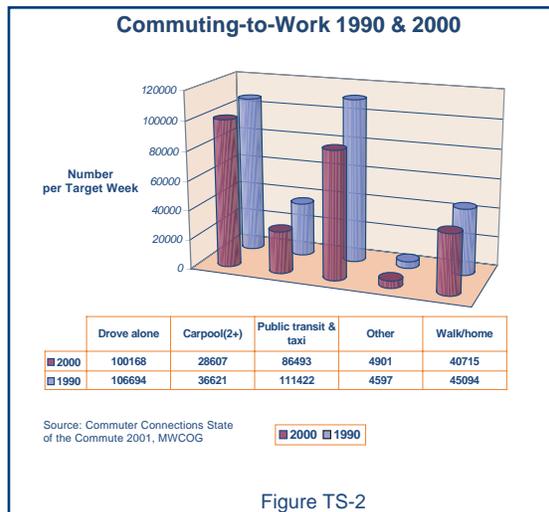


Figure TS-2

The District Department of Transportation, Traffic Services Administration, Traffic Operations and Safety Office maintains data on the volume of traffic entering and leaving the city. Approximately 850,000 vehicles enter the District daily. Traffic also is measured entering the inner, or business, core of the city. The Traffic Services Administration estimates that weekday traffic entering the core of the District has grown approximately 1-1.5% per year.

This means that 10 years ago there were approximately 348,000 to 368,000 vehicles entering the DC core business area each weekday. The "2000 Traffic Volumes" count shows that approximately 409,250 vehicles entered the core each weekday in that year. This 10-15% growth estimate somewhat parallels the increase in VMT measured by the U.S. Department of Transportation, Bureau of Transportation Statistics. The one-way vehicle commute time in the District now averages just under 30 minutes per driver and places the region as 35th out of 68 metropolitan areas.

Implications of the Data

Some of the data describing transit use in the District appears to be contradictory. U.S. Census Bureau data show declining transit ridership, and EIA data show declining fuel sales. On the other hand, WMATA reports increasing use of Metro transit. Most drivers would agree with the Roadway Congestion Index for DC and by observing that the period of peak congestion continues well beyond the morning and afternoon rush hours. The approximately 10-15% increase of traffic entering the DC core from 1988 to 2000 reinforces these observations.

These contradictory data might be explained in part by the fact that the city's population dropped 3.58% from 1990 to 2000. Also, energy sales data are reported for the District, not the metropolitan area as a regional entity. The Census Bureau data, like the EIA data, are specific to the District. However, WMATA provides transit data for the entire metropolitan region, which includes the District and the surrounding jurisdictions. WMATA serves a metropolitan population of more than 3.3 million, while there are just over 572,000 residents in the District. Hence, what the data appear to be indicating is that while fuel sales to, and transit ridership by, District residents diminished, traffic and transit associated with suburban commuters increased.

Congestion is not limited to motor vehicles. This was also obvious in the data used for CEP I. According to that data, annual bus ridership varied between 125 million and 160 million riders from 1977 to 1988, while rail passengers increased from the opening of the Metrorail in 1977 to almost 140 million by 1998. Available passenger capacity for Metrorail is now a concern, along with aging rail infrastructure. In June 2001, WMATA's Board of Directors approved extensive improvements for Metrorail, including canopies to cover escalators exposed to weather, an order for 60 additional rail cars, repair for older cars and new parking garages. Increased parking for Metrorail riders will help reduce traffic congestion in the District; however, it will also push Metrorail closer to capacity and increase crowding on rail cars.

Bus, rail and commuting vehicles are a regional, not just a District, problem. District authorities have a stake in not only helping residents of the District make wise commuting choices, but also in informing residents of the region about transportation options that will reduce energy consumption affecting DC.

Components of Improved Transportation

Signals and Traffic Management Intelligent Transportation Systems

The District suffers from traffic congestion brought on by construction, road cuts and traffic barriers imposed by the need for greater security in the nation's capital. While acknowledging congestion, District transportation planners also have become more sensitive to new alternatives, as well as the need for enhanced maintenance and transportation management. By defining traffic in terms of managing congestion vs. creating restrictions, the District has signaled its openness to innovative means of solving traffic problems.

Traffic signal modernization is an ongoing job. The DC system was last revamped in 1985. At that time, signal failures were reduced from an average of 25 to 30 per day to two or three. Now, the "new" system is older and repairs are back to the 25 to 30 per day level. State-of-the-art equipment is again being budgeted and, when installed, will improve traffic management and reduce congestion.

Managing traffic flow on a regional basis will smooth out vehicle entry into the District and reduce fuel wasting and air polluting congestion. The District is working with surrounding jurisdictions to coordinate traffic signals along shared roadways. Also, traffic-actuated signals at intersections will be upgraded so that light changes can be more effectively manage traffic flow. Traffic flow within the District has been aided by right turn on red, the adoption of which was accelerated by the Arab oil embargo of 1973-74 as an energy conservation measure (which became mandatory under DOE's State Energy Conservation Program), and has since been universally embraced for the additional benefits of reducing delays and unhealthy vehicular air pollutants. Left turn on red when both streets are one way is beginning to gain currency; Maryland and Virginia allow drivers to make such a turn unless there is a sign prohibiting it.

The District has become one of the nation's leading jurisdictions in supporting public-private partnerships using advanced technology for transportation information, especially intelligent transportation systems. These systems offer innovative technology-based solutions to many traffic and transportation problems and include traffic flow management, vehicle location, transit scheduling, roadway status, incident management and driver choice. ITS can be a critical component of a multi-modal transportation infrastructure aimed at maximizing system efficiency through seamless (i.e., easy) transfers from one mode of travel to another.

DDOT's Traffic Services Division is working to deploy an increasing number of ITS to enhance management and inform motorists. These will include permanent and portable variable message signs (VMS) powered by photovoltaic cells to reduce maintenance and mechanical failure. Closed

circuit television cameras (CCTV) are being deployed and connected to an improved central monitoring system to enhance incident response and management. Highway advisory radio (HAR) will parallel dial-up information obtained through SmarTraveler and enable motorists to make timely congestion-avoidance decisions. Regional information sharing is being designed so that ITS can be integrated across political jurisdictions.

Alternative Fuels and Air Quality

In response to air quality concerns, DDOT has increased efforts to improve bikeway infrastructure, purchase natural gas-powered transit buses, reduce emissions and examine multi-modal alternatives to single-system transportation choices. The District has paid close attention to Transportation Emissions Reduction Measures (TERM), including not only bikeways but also telecommuting, ride-sharing, and capital improvements. DDOT is an active participant in COG transportation planning efforts, including the development of the air quality-driven Transportation Improvement Plan (TIP) and is a key player in the list of planned projects found in the Constrained Long Range Plan (CLRP). The TIP incorporates the vision for many of the earlier traffic reduction ideas set out by the National Capital Region Transportation Planning Board (TRB). Among other goals, the TRB's vision includes the reduction of regional congestion and related incidents; a "user-friendly, seamless system with on-demand, timely travel information;" simplified payment options; improved incident management for weather and other traffic barriers; and improvements in the predictability and reliability of area transit and adoption of advanced transportation technology. The TIP is also an important document for identifying projects that can be funded under the Transportation Equity Act for the 21st Century (TEA-21). In turn, the CLRP sets out which projects are first in line for actual funding.

Greater use of AFV fuels such as compressed natural gas (CNG) will help the District reduce dependency on foreign energy sources. To this end, DCEO, as part of the COG Metropolitan Washington Alternative Fuels Clean Cities Partnership, obtained \$270,000 in DOE State Energy Program funds for three AFV-related projects in 2001. These are: an CNG-powered taxicab demonstration project, an CNG rental car program placing 20 AFVs among major local air and rail travel centers, and a CNG bus training program for WMATA and related agency staff.

Taxicabs have relatively high fuel consumption, and greater use of an AFV fuel in these vehicles could improve air quality. AFV taxicab programs exist in other cities; however, success varies. Indeed, a DC-based CNG-powered taxi company failed in the mid-1990s. Where taxicabs are under strong company management, AFVs can work; where large numbers of independent drivers own and operate the vehicles, success is less certain. Rental cars may provide a more promising market where they are centrally managed and a major source of transportation from area airports into the central city. AFV

training programs add value to any marketing effort and will be especially valuable for WMATA staff responsible for that system's expanding AFV bus fleet.

Congestion Mitigation and Air Quality (CMAQ) funding has helped to expand AFV refueling infrastructure in the District and the region. The DC Department of Public Works, Fleet Management Administration, recently opened a multi-functional, around the clock, refueling station at the agency's West Virginia Avenue, service complex. Washington Gas operates two refueling sites open to the public - one at Haines Point and the other at N Street near the Navy Yard. Another site, at the Anacostia Naval Base, has been open only to the military since the events of Sept. 11, 2001. WMATA has expanded CNG refueling capacity at its Bladensburg facility and is planning to do the same at its Four Mile Run facility in suburban Virginia.

Public Transportation

WMATA regularly surveys its riders and assesses their needs. Ridership is high and the Metrorail system is likely to reach full capacity within the first decade of the century. WMATA working to improve regional transit in a variety of ways.

Ridesharing and Related Alternate Transportation Options

Alternate transportation (e.g., carpools, bikeways, walking paths and telecommuting) has received much attention in the National Capital Area over the last decade. A draft Commuter Connections, State of the Commute 2001 - Survey Report, under review at COG in 2002, describes public perception of alternatives to single-driver vehicles, provides ample information about the progress made, and identifies remaining needs for alternative transportation in the District and surrounding region. Some of the principal points drawn from this draft report are worth noting:

Planned Regional Transit Improvements for the DC Metropolitan Area

- Family of Services aimed at seamless movement from neighborhood to work place.
- Approximately sized buses (e.g., small for neighborhoods, standard and articulated for major routes, coach for express long haul connecting at strategically placed transit centers.
- Accelerated headways.
- Real-time information systems posted at transit stops.
- Premium feeder service connecting to Metrorail.
- Express buses to parallel designated Metrorail routes.
- SmarTrip cards, Metrocheks, and TransitLink cards already enable customers to move easily and quickly among travel modes.
- Expanded parking at designated Metrorail stations outside the District (i.e., West Falls Church, College Park, New Carrollton).
- Automatic vehicle locators (AVL) on Metrobuses to communicate a bus' position to a Geographic Information System (GIS) map in the WMATA control center.

**District of Columbia Bicycle Initiatives
FY 2001-2006**

Bridge

- New pedestrian bridge over Anacostia Freeway

Trails

- Massachusetts Avenue SE
- Metropolitan Branch
- Rock Creek Park
- Rose Park
- Martin Luther King, Jr. Avenue/11th Street/18th Street
- FY2001 National Recreational Trails
- VDOT-CMAQ (includes DC funding)
- Employee Outreach for Bicycling
- Bicycle Parking

An additional 34 projects are planned for neighboring jurisdictions.

- The use of alternate modes of travel grew 5% from 1999 to 2001;
- "Drive alone" still accounts for more than 72% of commuting into the District;
- Alternate mode commuters tend to mix alternate travel with single occupant trips;
- Overall, about one-third of all commuters use some form of alternate travel during a given workweek;

- The number of people telecommuting has increased since 1998 but the frequency of their telecommuting has dropped slightly. Many survey respondents said they would like to begin telecommuting;
- Advertising and public information has some effect on respondents' travel choices;
- Employers have increased their subsidies for commuting assistance over the past several years;
- Federal agencies have provided subsidies and non-single-driver support for 84.5% of their workers vs. only 52.8% for non-profit groups, 44.4% for state and local government and 41.9% of private firm workers;
- Free parking for employees dropped from 72.2% in 1999 to 68.3% in 2001.

While the draft Commuter Connections, State of the Commute 2001 - Survey Report indicates that parking subsidies dropped between 1999 and 2001, subsidized parking continues to be a major barrier to reducing congestion and VMT associated with commuting into the District. Reducing subsidized parking is a sensitive issue for many workers who see it as one of the few remaining "perks" for their jobs. Many drivers continue to require the use of their single-driver vehicles for job-related and after-work trips. The

**Most Common Employer-Provided
Commuter Assistance**

- Fare subsidies -- 28%
- Information about travel options -- 25.3%
- Guaranteed Ride Home programs -- 18.6%

Washington Post reported in July 2002 that "few things rile up employees like messing with their parking." However, given driver frustration with traffic, the high

cost of fuel and both the health and infrastructure growth consequences of air quality non-attainment, the prospects for reducing parking subsidies may have improved more than observers realize.

Transportation Sector Recommendations

Recommendation TS-1

The District should encourage the use of AFV fuels by both public and private sector individual motorists and fleets, and enhance efforts to place associated refueling and recharging equipment at facilities accessible for public use.



Mayor Anthony Williams fills up a DC government vehicle with compressed natural gas.

Background

AFV acquisition should be coordinated with COG as the District's transportation system is inextricably linked to surrounding jurisdictions. In addition, state energy offices and departments of transportation in DC, Maryland and Virginia should be partners. Specific projects and programs should be coordinated among these organizations to avoid duplication and to leverage limited fiscal resources. Any effort to subsidize AFV-powered taxicabs in the District should include careful attention to ownership and operation issues that might hinder success.

Elements of this District effort should include:

- Professional help to identify locations where high volume purchase can take place (i.e., niche markets with high potential for dedicated AFV fleets);
- Identification of equipment that meets immediate and near-term (up to five years) refueling needs within budget;
- Technical assistance for adding refueling to existing facilities (including attention to historical, mixed-use and removal of hazardous materials issues);
- Technical assistance for building new facilities;
- Coordination of work with appropriate AFV fuel providers;
- Help for potential consumers in the immediate vicinity of new facilities;
- Public displays of encouragement for the entire purchase and construction process;
- Seeking additional CMAQ and other funds for abetting AFV market penetration;
- Follow-up (hand-holding) during the first several years of activity at converted and new facilities.

Recommendation TS-2

DCEO should collaborate with WMATA to enhance progress in AFV transit bus acquisition in order to reduce the District's dependency on foreign petroleum, mitigate its exposure to high petroleum fuel prices and reduce air pollution.



A DC Metro bus powered by compressed natural gas.

Background

The District Government has introduced 193 AFVs into its agency fleets; about one-half are powered by CNG and the remainder includes bi-fuel and E-85 vehicles. WMATA has purchased 164 CNG buses for use in the District and may add another 250. It has also repowered 100 buses with advanced diesel engines that

meet EPA standards and will install after-treatment exhaust filtration devices in another 926 buses.

CNG buses emit approximately .000931 tons of NO_x per day per bus vs. .001903 for advanced diesel units. While they produce higher non-methane hydrocarbons than diesel buses, CNG buses produce no discernible particulate matter (PM₁₀). Thus, they reduce a significant health hazard for transit riders and others. In spite of the significant AFV bus achievements for 2002 and 2003, diesel buses will continue to outnumber AFVs in DC by a factor of almost 2.5. The District should work to reduce this ratio in order to enhance air quality.

Recommendation TS-3

The District should explore opportunities for the use of station cars and similar means of moving from transit stop to workplace, work closely with WMATA to foster public use of transit, and accelerate employer and worker acceptance of non-traditional modes for work including telecommuting.

Background

Much has been done to reduce congestion. District officials have worked to overcome problems created by street cuts, infrastructure decline, street lighting and general upkeep such as tree preservation, potholes and traffic impediments. A new traffic coordinator was hired in early 2002, a full-time bicycle coordinator was brought on board and a first-ever state forester and arborists were hired. Other improvements planned include better signage, street cut management, enhanced maintenance, bridge repair, 1,200 blocks of re-paving and renewed attention to asset management.

WMATA plans to begin a variation of the station car concept called the WMATA Car Sharing Demonstration Program. Station cars are vehicles located at regional transit centers, Metro stops or stations that riders can rent for commuting to and from their ultimate destination and the transit stop. The proposed program will use a variety of rental fees in the form of hourly and mileage charges plus cost-reducing membership options. WMATA is also exploring the use of trolleys to augment existing bus and subway service. Additional energy and air quality benefits can be obtained by purchasing AFV powered station cars.

Other alternatives for urban transportation can be bolstered. These include telework, vehicle pooling and occasional emergency-ride-home support for transit users. The recent invention of an urban, one-person, rechargeable mobile platform called the Segway is another option worth exploring. Segways or similar units might work well in tandem with, or instead of, station cars. Safety, storage and security issues associated with their relative portability can be worked out where there is a will to meet the challenge of new, and less familiar, solutions to traffic congestion.

Recommendation TS-4

The District should coordinate with COG to identify private sector, local government and institutions employers in both the District and the region who could reduce or eliminate parking subsidies and initiate, expand, encourage and underwrite alternative transportation choices for drive-alone employees.

Background

The draft COG Report notes that "Worksite commuter assistance services appear to encourage use of alternative modes." Hence, of all the activities the District could undertake in this area, the most productive are likely to be those that encourage greater employer-provided subsidies and related assistance such as guaranteed-ride-home, computer matching for carpools and vanpools, transit subsidy, flexible work time, bicycling and telework.

Ideally, greater public awareness of regional air quality problems will cause commuters to accept employer-supported alternatives for subsidized parking. If this fails to reduce traffic congestion, then the District may wish to consider disincentives to reduce subsidized parking.

Recommendation TS-5

The District Department of Transportation should expand the use of Intelligent Transportation Systems such as closed-circuit TV, variable message signs and highway advisory radio to improve traffic flow, and investigate several additional, emerging, systems for driver and passenger use.

Background

The continuous slowing, stopping and accelerating of vehicles in congested traffic is the most inefficient way to burn motor fuel. Timely information will enable motorists to avoid such congestion. In addition to CCTV, VMS and HAR, these improvements should also include examination of real-time and driver-location-specific information alternatives such as the new 511 transportation telephone access number; global position system (GPS) downloads to personal digital assistants, on-board GPS and disk-driven map screens; mobile telephones that may enable regional motorists, local commuters and tourists to make timely decisions about alternate route options; and the use of transit.

The District should also support ITS improvements in regional transit. Additional ITS devices can display bus location and estimated time of arrival, just as they now do for subway trains in Metro stations. Signage can be located at bus stops, on buses, on VMS over roadways (also encouraging drivers to ride transit) and transit and traffic information can be communicated to personal computer, mobile telephones and personal digital assistant devices.

In the long run, ITS holds the promise of providing system-wide integration of both traffic and transit transportation options. Several elements of such a system are in place or under review. The challenge is for all potential stakeholders - public and private - to work together, take risks, incorporate improvements and make it happen. Success can be measured by counting reductions in traffic entering the District, recording increases in mass transit ridership and enumerating the commuters reaching work without using an automobile.

SPECIAL STRATEGIES

Energy Assistance

Goals

- To enhance the delivery of energy assistance services to the eligible population;
- To inform clients through counseling and workshops so that they can better manage their energy budgets.

Overview

DCEO currently operates one program that provides financial assistance to eligible households to help meet their immediate home energy needs. This program is the Low-Income Home Energy Assistance Program funded by the U.S. Department of Health and Human Services (HHS). LIHEAP helps serve needy District residents whose income is at or below 150% of the HHS poverty guideline programs. The Utility Discount Programs offer special discounts on four utility services for District of Columbia consumers that meet the same income level as required by the LIHEAP. Qualified DC residents can receive discounts on their gas, electric, telephone and water bills. These special discounts are known as the Residential Aid Discount (for PEPCO), Residential Essential Service (for Washington Gas), Economy II Telephone Service (for Verizon), and Customer Assistance Program (for Water and Sewer Authority).

According to the latest available statistics, 52,234 households in the District are at or below 150% of the federal poverty level. Beginning during the winter of 2001 with the severe weather conditions, utility bills skyrocketed, rendering many low-income households unable to pay them. While the price of energy in general has fallen from its previous 2000-2001 high level, the stark reality is that many households are barely able to meet their immediate energy needs and a large number of these households are experiencing service terminations. It is harder for low-income households to pay their energy bills because these costs represent a much larger percentage of their household income as compared to non-low income households.

Based on data from LIHEAP files, approximately 65% of all LIHEAP applicants request bill-paying assistance year after year. However, due to a severe winter that produced serious spikes in energy costs, along with the economic downturn resulting in part from the terrorist attacks of Sept. 11, 2001, households that have never previously sought energy assistance are now applying in record numbers. Many households are having problems paying their bills and subsequently finding themselves in arrears, receiving cutoff notices, and in far too many cases having their services terminated.

Energy Assistance Recommendations

Recommendation EA-1

DCEO, in concert with Washington Gas, PEPCO and the DC Public Service Commission should explore the development and implementation of a Percentage of Income Payment Plan (PIPP) for the low-income residents of the District of Columbia.



A low-income resident applies for energy assistance.

Background

Given the tremendous financial burden experienced by low-income households in trying to meet their home energy needs, an increasing number of states and utilities are exploring and implementing new approaches to income-based energy assistance programs for their low-income clients and customers. In other words,

there is an effort to establish payment programs that are based on a customer's ability to pay. Such programs seek to ensure that low-income households pay no more than a reasonable portion of their income toward their home energy bills.

In general, states that have adopted, or are planning to adopt, some form of a PIPP, have done so with two basic mechanisms in mind: a co-payment mechanism and an arrearage forgiveness mechanism. The core thinking is the premise that a low-income household should be asked to pay only a reasonable percentage of its income for its home energy needs. The first component is oriented toward current bills. The theory is that as long as the customer makes regular monthly payments toward its home energy bill based on a predetermined and reasonable percentage of its income, LIHEAP will pay the difference between the household payment and the actual bill. The second component is oriented toward arrearages prior to the applicant's participation in the program. So long as the customer continues to make complete and timely payments toward current bills, any such arrearages will be forgiven over a three-year period. In addition, so long as such payments are made, while the household remains responsible for the shortfall, the utility may not use the disconnection of service as a collection device.

Recommendation EA-2

DCEO should resume energy conservation education for all low-income customers applying for energy assistance, as well as for other interested District of Columbia energy consumers.



Energy workshops educate low-income residents about energy saving programs.

Background

Energy costs continue to rise and federal funding for energy assistance programs barely survives Congress each year. Assisting low-income District residents in paying their energy bills by itself does nothing to conserve or cut the long-term cost of energy. Therefore, conservation workshops and other innovative energy-saving

measures have been devised to complement the bill-paying aspect of LIHEAP. The financial assistance component of LIHEAP is expected to continue as long as federal funding is available and as long as the low-income citizens of the District continue to have difficulty in keeping up with their energy costs. The level of effort projected for the next several years is 16,000 payments annually.

To more effectively assist in meeting the most immediate energy needs of the District's poor, DCEO should resume providing educational support through conservation workshops. Since 1985 the DC Energy Office made it a requirement that before a resident applied for fuel bill assistance, he or she had to attend a 30-minute energy workshop on how to install low-cost materials to reduce energy use, save money and improve comfort. This workshop was presented to about 40-50 clients at a time but was discontinued in 1996 when DCEO moved to its current location and space for this activity was not available. These workshops should be revamped, re-energized and resumed if the space issue can be resolved.

Participation in the workshops offered at DCEO would be a requirement of LIHEAP customers before their applications are taken. These workshops would include hands-on demonstrations showing tried and true do-it-yourself low-cost or no-cost methods to help reduce energy use at home, as well as the distribution of conservation education materials. The workshops will generate a variety of benefits including more efficient use of energy, a reduction in the incidence of shut-offs and arrearages, and a reduction in dependency on government assistance. A savings of 10% or more annually is often achieved by the use of low-cost/no-cost and other energy

conservation measures. The curriculum for these workshops should be modified as needed to incorporate the most recent ideas and technology available regarding energy efficiency and conservation.

The National Center for Appropriate Technology reports that up to 30% of the annual income of the poor and the elderly is spent on energy. In conjunction with these findings, data from the LIHEAP files and subsequent evaluations of the program indicate that nearly 65% of all LIHEAP applicants request bill payment assistance year after year. Previous program evaluation also shows that 30% of the applicants repeatedly suffer disconnections or experience arrearages that are not addressed from one program year to the next. Therefore, this educational support must be continued, reinforced, and enhanced annually.

Recommendation EA-3

Individualized counseling, including household budgeting, utilization of other energy services, and referrals for upward mobility and employment should be made available to LIHEAP and UDP customers.

Background

Utility rate increases and escalation of the costs of other energy resources, which quickly exhaust the means of persons living on limited incomes, constantly confront District residents. Low-income households who are served through the LIHEAP would benefit greatly through energy budget counseling, educational counseling, and information on other energy programs that would lessen negative impacts on their household expenditures. Implementation of this proposal would assist in leveraging resources so that clients might become self-sustaining. It also would encourage clients to manage their own affairs and energy budgets, and to achieve an adequate standard of living.

DCEO staff receives numerous requests for other than energy-related services. Such observations support the need for individual counseling of LIHEAP and Utility Discount Program customers. Acute energy bill arrearages and energy shutoffs indicate that fixed incomes cannot be stretched to accommodate all household expenses or that incomes are not being adequately managed. In addition, these customers are frequently unable to understand charges on energy bills and payment summaries, or cannot read utility meters.

Budget and other counseling can provide LIHEAP customers with a wider range of options and opportunities. Referrals to other programs designed to improve skills will increase their chances of obtaining higher paying jobs. This counseling will be designed to provide an analysis of the household's budget payment plans with energy suppliers. Representatives from the utility

companies could be at the DCEO office on a scheduled basis to set up payment plans for LIHEAP and UDP customers. In addition, counseling would include information about reading gas and electric meters and bills and understanding utility summaries, as well as promote the coordination of DCEO activities with other public and private agencies that offer a wider variety of counseling and educational opportunities, thus enhancing the possibility of both social and economic growth.

The activities under this recommendation would likely be funded by the Residential Energy Assistance Challenge grant from the U.S. Department of Health and Human Services.

Recommendation EA-4

DCEO should petition the Public Service Commission to request that Reliable Energy Trust Funds be made available to the LIHEAP so that more needy low-income households can be served, thereby lessening tremendous energy burdens and improving the quality of life for many.

Background

According to current census data, there are approximately 52,000 District of Columbia low-income households that are eligible for energy assistance through the LIHEAP. DCEO serves about one-third of these eligible customers and has had to turn away hundreds of potential customers at the end of each season for lack of funds. According to the National Center for Appropriate Technology, approximately 60% of the states augment their energy assistance programs with state funds. If the District's LIHEAP were to be granted RETF funds from utility ratepayers, additional low-income customers would be served, thereby enhancing their quality of life and possibly averting utility service terminations and evictions.

Recommendation EA-5

Wireless technology should be adapted and implemented for use in the LIHEAP homebound component to better and more expeditiously serve the needy customers of the District of Columbia.

Background

One very crucial operation of the LIHEAP is called Homebound Outreach. This component is required by statute, mandating that states must provide assistance to those persons unable to leave their residences. Currently, DCEO dispatches the homebound coordinator to such residences after having received a request through the DC Energy Hotline from the homebound customer. The application is brought back to DCEO, entered in the computer system and subsequently a copy of the application showing the approved

benefit amount is sent to the customer. These DCEO printouts are accepted and recognized by the utilities as guarantees of future payment, and customers frequently utilize them to prevent cutoffs or restore service.

With the implementation of wireless technology, an application could be taken on site and a copy of the application issued on the spot. The customer would immediately know the approved benefit amount(s) and to which vendor the benefits would be going.

Recommendation EA-6

Electronic payment of LIHEAP utility benefits should be designed and implemented so that utilities can apply benefits to customer accounts more expeditiously.

Background

Each year thousands of District of Columbia households apply and receive financial energy assistance through the LIHEAP to help them meet their home energy needs. As a rule, utilities receive customer benefit payments through the mail in about six to eight weeks. In order for this DCEO program to provide optimum support to the District's needy, benefit payments should be advanced to each utility at the earliest possible time. The quicker the payment, the less likely a household's service will be interrupted. Technology exists that can provide utility payments in as little as 48 hours. DCEO should examine the feasibility of implementing such technology in its LIHEAP operation.

Recommendation EA-7

The Capital Access Electronic Benefits Transfer (EBT) capability should be designed and implemented for LIHEAP customers whose heat is included in the rent, thus providing for a more cost-effective operation while allowing needed cash to be more readily available to customers.

Background

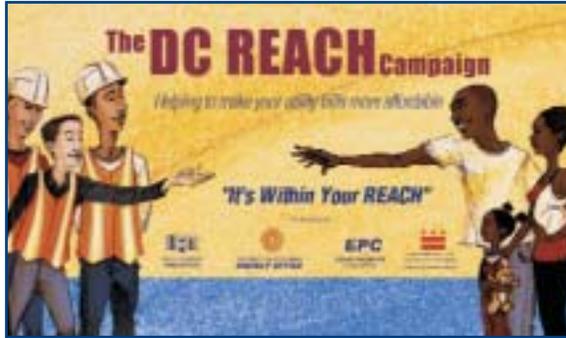
Most of the residents that are eligible to receive LIHEAP assistance are customers that have utility accounts with either PEPCO or Washington Gas, and as such, their benefits are sent directly to these utilities for posting. However, approximately one-fourth of the households that are eligible for LIHEAP assistance are customers whose heat is included in their rent (HIR), and as a result individual benefit checks are mailed to their residences. This process is costly and inefficient.

The District currently disburses Food Stamp Program benefits and Temporary Assistance to Needy Families benefits via the District's Capital Access Electronic Benefits Transfer program. Clients use grocery point-of-sale

terminals and automated teller machines to gain access to monetary benefits. DCEO wants to expand the Capital Access EBT Program to include the HIR clients participating in LIHEAP.

Recommendation EA-8

DCEO should utilize the Residential Energy Assistance Challenge (REACH) as part of its marketing campaign for LIHEAP and UDP programs.



The REACH program provides energy and other social services to low-income DC residents.

Background

The DC Energy Office has been in the business of assisting low-income citizens with their utility bills and weatherization since the office was established in 1981, and has been serving more than 16,000 District residents annually through its Low-Income Home Energy Assistance Program. In an

effort to further promote energy efficiency programs in the District, DCEO intervened before the Public Service Commission for help from the utilities, and as a result the PSC mandated low-income utility discount programs for gas, electric, and telephone customer that are administered by DCEO.

The LIHEAP and UDP programs are at present promoted through the use of media announcements, targeted mailings, community events, the DCEO website and word of mouth. While these assistance activities help many families each year, there are many more that go unserved who could benefit from these programs if they knew about them. In 2002, DCEO received a grant from the U.S. Department of Health and Human Services to implement a REACH program designed to turn the threat of supply and price volatility, especially in the new environment of a restructured electric and gas retail business, into an opportunity for energy affordability for low-income households. To capture such an opportunity requires an aggressive program that reaches out and partners with other sectors of the District of Columbia to advance the needs of low-income consumers, and RETF funds could supplement the REACH grant to ensure its success.

It is the intention of this recommendation to devise and carry out new approaches for a marketing campaign under the auspices of REACH to help relieve LIHEAP-eligible residents of the energy burden that continues to face them month after month, and to assist them in becoming more energy self-sufficient.

Education/Public Information

Goals

- To expand public awareness about energy efficient living;
- To enhance energy education within public and private schools;
- To increase knowledge of and access to DCEO programs.



The Tour de Sol miniature electric car race educates public and private school students about alternative fuel resources.

Overview

Energy education and public information have been an important part of all DC Energy Office programs for the past two decades by educating our citizens through community workshops, energy curricula in the schools, and the production and distribution of educational materials. Our youth - who one day will be

making decisions for themselves, their families and their employers about the importance of energy efficiency - can have a significant positive impact. Effective education can save money, preserve resources and improve comfort. The recommendations in this chapter incorporate lessons learned from past efforts that both worked and didn't work. Future strategies will be suggested for educating and informing our community that reflect the agency's vision and that incorporate new technologies. There are recommendations for producing and distributing program videos, reformatting the DCEO website, extending outreach activities utilizing a new look to its in-house published literature, and showcasing high energy performance in a renovated home. Successful energy education programs must address behavioral changes, introduce easy-to-understand and affordable ways to retrofit residential and commercial structures, and demonstrate techniques for properly maintaining heating and cooling equipment, among others. Repeating the message in a user-friendly manner, through available print, broadcast and electronic media, is key.

A strong network upon which to build has been created within the residential and commercial communities and the DC Public Schools, where a longstanding partnership with DC schools keeps teachers and students year after year asking for more. Energy education will continue to be integrated into K-12 math and science curricula. Because technology has taken a giant leap since the last CEP was published, interactive computer programs taking advantage of the World Wide Web will be put in place. All DC public schools will be able to participate because classrooms now have access to computers and the Internet.

The DC Energy Hotline is a vital communication link with the community. It has recently been upgraded to allow for much more detailed information to be electronically given to callers. More efficient customer service is also a benefit of the enhancement. The Hotline will provide faster, cheaper and better service to callers.

Inter-governmental coordination is essential to eliminating duplication of services and strengthening overall customer service. Additionally, accurate and timely exchange of program information with other agencies, the utility companies and private entities will be a priority.

Education/Public Information Recommendations

Recommendation PI-1

Interactive computer activities should be incorporated into the public school energy curriculum for grades K-12.

Background

The DC Energy Office has been involved in the DC public schools since the early 1980s. Since that time, a strong partnership has been established with many schools despite changes in principals and teachers. Training sessions for science and math teachers on how to integrate energy materials into the standard curriculum have been very successful, as concept of energy efficiency provides multi-disciplinary learning opportunities in mathematics, science, language arts and computer skills. The training has become so popular that in recent years registration for the sessions had to be cut because too many teachers were registering. The content surveys given to the teachers during the sessions have revealed that teachers want to use interactive computer games and lessons as a teaching tool. The computer is attractive and fun for both teacher and student, and classrooms have access to computers and the Internet. Hands-on training for new computer activities for teachers could easily be provided using the network already established. The DC Energy Office would place the energy activities on the DCEO website such as WonderTreks, which offers guided Internet research on conserving energy and other related topics. Students are led through the sites by multiple-choice questions that are automatically graded after the research has been completed on the provided sites. This creates a contest environment that adds to the interest. Its use can be monitored and evaluated, and the site updated accordingly. Examples of other interactive web sites and activities include EIA's Kid's Page, the Alliance to Save Energy's PowerSmart, Watts Going On from the Renton, Washington School District, Alliant Energy's Power House Kids, and DOE's Dr. E's Energy Lab.

To supplement the computer activities, an energy conservation education workshop could be offered to both students and their parents, and the effects of the workshop in terms of its influence on household energy usage measured.

Recommendation PI-2

The DC Energy Hotline should provide information that would promote green choices for energy efficiency for all DC consumers, especially in the residential sector.

Background

Energy Star labeled products meet high standards for energy efficiency and quality, which means they use less energy without sacrificing performance. The DC Energy Hotline would be a source for receiving a free catalog of Energy Star rated appliances and lighting, similar to the one prepared by Portland, Oregon, as a means for market transformation. A green choice catalog would include products such as refrigerators, dishwashers, clothes washers, heating and cooling equipment, lighting, consumer electronics and home office equipment that save money and reduce energy consumption in single-family homes, townhouses, apartments and condominiums. The catalog would be promoted by TV public service announcements, cable, radio and the print news media. Tools to calculate savings by switching to Energy Star products, information on rebate and coupon programs available through the local gas and electric utilities, and a dealer locator to help find stores that sell such products could also be included.

Recommendation PI-3

The DCEO website should be redesigned to be more consumer friendly and to allow for interactive participation of people visiting the site.

Background

Aware and educated consumers are critical to energy conservation and efficiency. The DCEO website could more aggressively promote these concepts through marketing awareness, education and technical assistance for end-user energy customers and those influencing energy decisions. New, visually appealing energy efficiency information and easily understood tips on how to lower usage and cut costs could be added to the site to make it more interesting and useful. The DCEO website would support energy conservation workshops for LIHEAP clients by including seasonal visual energy tips and allowing for interactive input by the community. During the fall and winter months, the DC Energy Office distributes low-cost energy efficiency materials to low-income residents. Some of the most popular items requested are plastic storm window kits, latex caulk, a caulking gun and a power failure night-light. Step-by-step, illustrated instructions on how to use and install these and other items, and how to calculate the individual and cumulative dollar savings from these simple measures, will be placed on the DCEO web page. Additionally, highly graphic, quickly understood worksheets to help people understand how to read utility bills and gas and electric meters can also be included. Visitors will be surveyed to determine which areas of the website were most interesting and useful, as well as be asked for suggestions for future enhancements.

In the past, DCEO's Energy Extension Service offered an energy library, a hotline, a speakers bureau and financial assistance to local groups to promote energy awareness. Due to budget constraints most of these offerings were curtailed, and today only the hotline, energy library and speakers bureau remain. An enhanced website, using modern technology, would help fill this void.

Recommendation PI-4

A media production capability should be established to produce short videos specific to each DCEO program.

Background

The videos will be aired on the local cable channel, and public service announcements will be developed from each video and sent to local TV stations to air. These public service announcements will be developed and disseminated with the idea of encouraging energy conservation and use of alternative fuels, and will be creatively packaged to entice local television stations to air them during prime time. These products also could be produced in CD and DVD format. They would complement DCEO's programs and help tell the story of the services available, as well as provide specific, timely tips on how to make your home or apartment more energy efficient. This production capability could be funded by REACH and/or RETF.

Possible topics for these videos could include heating, cooling, hot water, lighting, cooking and refrigeration, laundry and dishwashing, miscellaneous appliances, transportation, water conservation, recycling, renewable resources and energy conscious landscaping.

Recommendation PI-5

A Mayor's awards program for energy efficiency should be created using established energy efficiency standards as benchmarks to be reached or surpassed.

Background

Awards would be offered to all sectors of energy consumers that meet program standards such as defined by EPA's Energy Star program, the U.S. Green Building Council's LEED program, and DOE's EnergySmart Schools Program. Potential participant groups could be businesses, government, schools, hospitals, homebuilders, landlords, homeowners, tenants and places of worship, community-based organizations and transportation fleets such as WMATA, UPS, FedEx and Tourmobile that demonstrate exceptional innovation or outstanding performance, particularly those capable of widespread replication. The awards would be designed and presented in a way that makes them coveted, and the presentation ceremony a well-publicized event. Various strategies, including sponsorships, would be used to encourage participation in some of the award categories. Certificates would be provided to all participants.

Recommendation PI-6

An existing residential structure in DC should be rehabilitated as a model "Zero Energy Home" to showcase energy efficiency and alternative energy sources.

Background

The Zero Energy Home (ZEH) concept has as its goal combining commercially available renewable energy technologies (at a minimum solar hot water and photovoltaics) with energy efficient construction techniques in order to provide the home's energy demands while minimizing net energy consumption for non-renewable energy sources. The home would incorporate features such as high performance heating and cooling equipment and appliances, advanced controls and communication equipment, solar electric, passive solar and solar water heaters, daylighting and other illumination strategies, highly efficient doors, windows, walls and roof, energy conscious landscaping, and a variety of additional techniques that could reduce utility bills by at least 50% of the norm. The ZEH also would demonstrate how cutting-edge technology could be integrated into a home without compromising its design, and at the same time be cost-effective. The home could be based in part on Southface Energy Institute's demonstration house in Atlanta, Georgia.

The house would be open for public view and would include supporting literature and interactive computers to describe what is included in the house and where they can be purchased, as well as offering practical tips on how the visitor can make his or her own home more energy efficient and in tune with the environment. The intent is to spark interest in efficient technologies that can be purchased by the general public today - for example, compact fluorescent light bulbs, clothes washers and dryers, and refrigerators, and to strengthen local demand for solar energy products and applications.

The show home would qualify under several national programs that advocate energy efficient and environmentally responsible construction, such as EPA's Energy Star program and DOE's Million Solar Roofs initiative, and could be supported with RETF monies.

The DC Energy Office hopes to secure the house through negotiating with the District Government, and a local university would be solicited to create the rehabilitation plans; area builders and retailers also would be asked to participate in the project. The public would be encouraged to visit the house often to see energy efficiency at its best. Materials and equipment would be updated as new items enter the market. This high visibility project would also be a means of introducing innovations in energy research and development, and could be an interesting school trip for science and environmental studies classes. The DC Energy Office would take advantage of the already established network in the public schools to schedule tours of the house.

Regulatory Intervention

Goals

- To sustain an effective presence before the Public Service Commission and the DC Council to promote energy efficiency and renewables and to ensure fair utility rates and practices;
- To assess the effects of the changes in the regulatory environment and energy markets on energy consumers;
- To mitigate the effects of utility prices on low-income consumers and the DC Government.



The program will focus on the development and implementation of fair and reasonable rates on utility bills.

Overview

The Regulatory Intervention component of the Comprehensive Energy Plan is focused on the development and implementation of fair and reasonable rate schedules and reliable electricity, natural gas and telephone service to all customers in the District of

Columbia, as well as supporting appropriate initiatives in the legislative arena. The use of energy efficient technologies and behavior, especially given the transition to a competitive market process that allows DC gas and electric customers to choose their supplier, has never been more critical.

These objectives involve measures for determining whether energy and public utility outcomes such as price and service fairness, appropriate competition in the provision of electricity and natural gas, quality utility service and the promotion of best practices to achieve energy efficiency in all end-use sectors. They should also contribute to overall DC Government energy conservation, management and financial goals, as well as to an improvement in the quality of life for all who live, work and play in the District of Columbia. These efforts will promote economic self-sufficiency for all families and individuals, restore and revitalize communities, expand affordable and quality housing and businesses, create a DC Government that works better and costs less, and establish and enhance cooperation among institutions and governments.

Attaining these objectives requires continued close cooperation with public, corporate, educational, faith and community-based organizations. These organizations represent residential, commercial and institutional utility consumers and provide support for existing and proposed utility and regulatory initiatives made possible by the electric Reliable Energy Trust Fund.

Regulatory intervention also involves advocacy on behalf of the government and the low-income residents of the District of Columbia. When utilities (gas, electric and telephone companies) propose changes to the current structure

of services and charges to customers before the Public Service Commission, the goal of regulatory intervention is to ensure that all changes are reasonable and will benefit all DC electricity and natural gas customers, particularly low-income customers, in a way that both supports overall concerns of consumer fairness and promotes energy efficiency throughout the District.

Two very important shifts occurred in the energy regulatory landscape in the District of Columbia: 1) the introduction of competition in the provision of electricity, natural gas and telephone service to DC consumers, and 2) the development of the RETF and Universal Service Fund. When the District of Columbia deregulated its energy markets, it allowed energy suppliers other than the regulated utilities to compete for customers. Consumers now have a choice of their natural gas and electricity supplier in an increasingly competitive market.

Municipal aggregation, made possible through the restructuring of the electric market, allows the District Government to procure electric power and related services on behalf of electric customers in the community. Aggregation, or cooperative buying, is the grouping of electricity customers to command from energy suppliers lower prices than if each individual consumer were to enter the market alone. The aggregation of small buyers can be an efficient means of overcoming barriers in the marketplace in jurisdictions such as the District where retail competition, or "customer choice," has been introduced without the need to own physical facilities such as distribution, generation or transmission assets.

Through the RETF, the PSC is providing \$8 million per year over the next four years and up to \$20 million per year for the subsequent five years (\$2.2 million is currently approved) to develop, extend and pursue programs to support low-income energy consumers, energy efficiency, and renewable energy technologies pursuant to the electric deregulation law. RETF-funded programs provide opportunities to introduce and extend Energy Star and green power products and services, particularly in the use of appliances, HVAC systems, lighting and other technologies in the office, home, congregation, health care facility and school. Methodologies for incorporating various cost-benefit analyses for these technologies and innovations are also being developed, and range from traditional all-ratepayer methods to more comprehensive societal methods.

The development and adoption of cost-benefit analyses of regulatory programs funded by the RETF is a crucial component in regulatory intervention. Validated methods will enable DCEO and other key DC Government agencies, community-based organizations and businesses to monitor the effectiveness of programs sponsored by the RETF.

To support its regulatory intervention efforts, the DC Energy Office needs to have the authority to assess and enforce the decisions that result from the programs and responsibilities with which it has been charged.

Regulatory Intervention Recommendations

Recommendation RI-1

A five-year strategic plan should be implemented to address the areas of focus of the legislation governing the RETF, which are energy efficiency, renewable energy and low-income electric customers.

Background

RETF funds should be utilized for those who require financial support resulting from the deregulation of electricity. This may include providing programs to assist non low-income residents maintain electric service and conservation programs that would be available to all residents, small businesses and certain government facilities. Some of the specific programs that will be pursued/developed are market transformation, green power and net metering.

The purpose of the RETF is to provide support and alternate technology to the electric customers of the District of Columbia. In many other areas across the country there are programs that go beyond the low-income population to assist in bringing the benefits of deregulation and technology to all ratepayers. The role of regulatory intervention in this process is to pursue programs that would benefit the electric customers of the District of Columbia before the PSC. It is also recommended that the RETF be used as a model for the development of a natural gas RETF-type fund for the same purpose. This model could be used to modify the Universal Service Fund (telephone) for the expansion of programs available to Economy II customers.

An integrated RETF strategy, with its aim of fulfilling the PSC's requirement that such funds support low-income energy consumers, energy efficiency, and renewable energy technologies, is addressed throughout this Plan via various end-use sectors and special strategies. These recommendations, if approved and implemented, could make a difference for all electric ratepayers, include supporting performance contracting and other alternative financing options by the DC Government; establishing a Home Energy Rating System and an associated residential mortgage and loan program; rehabilitating a home to showcase energy efficiency and alternative energy sources; expanding the Residential Conservation Assistance Program to incorporate components that reduce peak demand; encouraging the use of green power in the Residential Sector; creating a resource guide for public housing personnel; promoting the purchase of Energy Star rated products for homeowners and small businesses; establishing tax incentives and loans for commercial/industrial energy efficiency and renewables; resurrecting the Institutional Conservation Program for schools and hospitals; launching a "Green Faith" initiative for congregations; supplementing LIHEAP funds for low-income energy

assistance; developing an expanded capability to raise public awareness, promote energy programs and disseminate information to specific target groups; promoting net metering; and supporting the development and application of renewable energy technologies in the District; and establishing an energy efficiency and renewable technology transfer program.

The development and implementation of cost-benefit analyses and tests for RETF-funded initiatives are essential to providing maximum public benefits to the government and the residents of the District of Columbia, and would give the District the opportunity to work closely with electricity and natural gas consumers on the adoption and installation of cost-effective technologies for improving energy efficiency and preserving the environment. It is essential to assess which technologies and strategies are most appropriate for use in the District. Favorable cost-benefit would allow the District to actively promote measures such as net metering, demand management, distributed generation and green power. The cost-benefit methodology must include consideration for social benefits as well as the financial aspects. Many states are now using what is called an "all resources test," which incorporates the societal aspects of a program into the analysis. New York and Colorado are only two of the many examples of states using the all resources test.

Recommendation RI-2

A District of Columbia Municipal Aggregation Program should be developed and implemented.

Background

The Retail Electric Competition and Consumer Protection Act of 1999, DC Code 2001 Ed. §34-1515(a)(1), authorizes the Mayor to develop a municipal aggregation program. Currently, Standard Offer Service (SOS) under DC Code 2001 Ed. §34-1515 authorizes a rate reduction of 7% for residential customers and 6.5% for commercial customers through Jan. 1, 2005, allowing ratepayers to share the proceeds from the sale of PEPCO's power plants located outside of the District. The District of Columbia Municipal Aggregation Program (DC MAP) Task Force seeks to lower the energy burden for the DC Government executive branch and independent agencies, District residents and other entities within the District of Columbia. The purpose of the DC MAP is to provide cost stability for electricity customers up to and beyond Jan. 1, 2005 by acting as an aggregator for the participants in the program. The DC MAP will not take title to any electricity or sign any contracts on behalf of another entity. Future endeavors for the DC MAP include the possibility of adding a green power component to the program in an effort to support a cleaner environment. It is anticipated that RETF funds will be used to support a low-income component of this project.

The District of Columbia Office of Contracting and Procurement (OCP) recently released a Request for Expression of Interest to gain additional information on the level of interest from energy companies to supply electricity

to participants through an aggregate local buying contract. Many states and municipalities allow aggregation for the purpose of purchasing electricity; customers in California, Massachusetts, Pennsylvania, New York and Ohio, among others, have achieved savings through aggregation. One of the most well-known examples is in Cape Cod, Massachusetts. The program, known as the Cape Light Compact, was established in 1997 and brings together the buying power of more than 185,000-metered customers in 21 towns and two counties. Since its inception in 1998, the Compact has expended \$923,679 in running the program and generated savings of approximately \$35 million as a result of its aggregation efforts, energy efficiency programs, distributed and renewable energy activities, and participation in the regulatory process.

Recommendation RI-3

Innovative distributed generation options should be advocated before the PSC, including renewable energy options, small power production and net metering.

Background

The introduction of competition into the electric marketplace has driven the development of new electrical generation technologies. Distributed generation, the use of small-scale power generation technologies such as photovoltaic systems, fuel cells and microturbines located close to the load being served can enable utilities to defer or eliminate costly investments in transmission and distribution system upgrades, at the same time providing customers with better quality, more reliable energy supplies and a cleaner environment. Distributed generation may add redundancy that increases grid security while powering emergency lighting or other critical systems.

The District of Columbia currently has very little electric generation available for public use located within the city boundaries, although the Potomac River plant (a coal-fired, 482 megawatt facility) is close by in Virginia. It is important for electricity reliability that the District of Columbia considers alternatives to the local utility and power providers by encouraging individuals and businesses to obtain alternative forms of electricity production, including photovoltaics and fuel cells. In order to effectively encourage individuals to invest in these technologies it is necessary to have tangible benefits. One such benefit could be derived from net metering, which would allow the excess electricity generated by the alternative power source to be sold to the utility. The Retail Electric Competition and Consumer Protection Act of 1999 allows residential and commercial utility customers in the District of Columbia to net meter renewables, fuel cells, and microturbines up to 100 kw in capacity, although treatment of net excess generation is not clearly specified. Specific rules implementing this bill are still pending at the Public Service Commission. Low cost distributed generation in the District could be economically beneficial

if, based on needed PJM demand, the net excess could be sold elsewhere at a higher price than that being sold to DC consumers.

Recommendation RI-4

DCEO should be given the authority to assess the costs of intervening on behalf of low-income residents and the DC Government before the PSC to the utilities and energy suppliers operating within the District of Columbia.

Background

DCEO was officially established on March 4, 1981, and since then has provided thousands of low-income residents with utility bill assistance, workshops, conservation kits, energy audits and the free installation of energy conservation measures. Also, DCEO has been educating future generations of District residents through energy conservation programs in the DC Public Schools, as well as effectively promoting energy programs that have been beneficial to the DC Government. The mission of DCEO is to commit its resources to making the District of Columbia energy efficient by providing these specific yet comprehensive services: 1) energy efficiency measures for all end-use sectors (residential, commercial/industrial, government, institutional, and transportation); 2) energy education and promotional activities; 3) intervention in utility regulatory proceedings and legislative matters; and 4) energy payment assistance to low-income residents.

Currently, DCEO has to absorb all of the costs related to intervening on behalf of low-income residents and the DC Government before the PSC. Much of this cost has been absorbed by Petroleum Violation Escrow (PVE) or oil-overcharge funds, which became available to the states beginning in 1983 as a result of alleged violations of federal oil pricing controls. These funds are nearly exhausted, and grants received from the federal government cannot be used to replace the PVE funds used to advocate positions before the Commission.

Assessment authority would allow DCEO to become more active in the daily pursuit of its statutory obligations and responsibilities, thus providing it with an effective financing mechanism to continue its mandate of pursuing the establishment of fair utility rates, discounted utility services for low-income residents, and conservation programs and policies that foster energy efficiency and affordable services for all segments of the city, with particular emphasis placed on the most vulnerable among us, as well as municipal facilities whose energy bills are paid with taxpayers' money. The downside of not finding funds for the aforementioned activities would be lost opportunities to continue to make the District of Columbia energy efficient.

Research and Development

Goals

- To accelerate the implementation of new energy efficiency technologies;
- To assess the effectiveness of newly adopted energy efficiency technologies;
- To foster an energy research and development environment in the District.

Overview

The research and development component of this Plan focuses on the development of innovative, effective and affordable technologies that achieve energy efficiency and cost control, with the primary objective of ensuring an adequate, economically affordable and reliable supply of energy for all citizens, businesses and industries in the District of Columbia.



Research and development activities can result in innovative ways of achieving energy efficiency.

The process for pursuing this goal includes the development of strategic alliances between DCEO, other DC Government agencies, federal agencies and a variety of business, research, university and community-based institutions.

Energy research and development opportunities abound for commercial, residential and institutional users. The improvements in and deployment

of active, passive and photovoltaic solar technologies, smart energy management systems for commercial, multi-family and residential buildings, Energy Star rated for refrigerators, water coolers, freezers, lighting, office equipment and HVAC systems are finding their way into many DC offices, homes, schools, health care facilities, recreational centers and places of worship. Research and development facilities like the Oak Ridge National Laboratory and the National Center for Renewable Energy, and, of course, the private sector, continue to refine and create renewable energy technologies that are cost-effective and practical.

Less than 200 homes in DC use any form of solar or renewable energy technologies, and less than 40% of the commercial and multi-family buildings have installed smart energy systems or the most energy efficient lighting, cooling, heating, cooking or office equipment. Green programs are attempting to close this knowledge and usage gap through the development of investment programs for supporting research and development programs and

through the exchange of information about such opportunities - opportunities not only for the end-user, but for the developer and marketer also.

Given these challenges and opportunities, closer collaboration with DOE and EPA is urged to promote the use of equipment and know-how that make efficient use of our energy resources. This collaboration would support such technologies as passive solar and siting techniques, natural lighting in architectural design, combined heat and power, fuel cells, ground-source heat pumps, thermal energy storage, biomass, and computerized monitoring and control systems, to name but a few of the myriad proven and emerging options with the potential to reduce energy use in the District of Columbia.

Research and Development Recommendations

Recommendation RD-1

Support should be provided to increase the development and application of renewable energy technologies such as active, passive and photovoltaic solar energy, fuel cells, and other sustainable sources of energy.



The development of new energy technologies offers opportunities to better manage our energy resources.

Background

Currently, less than 200 households in the District of Columbia use these technologies for heating, cooling, lighting and producing hot water. This number could be increased to 2,500 by 2007. In addition, the number of commercial and multi-family buildings equipped with innovative building and equipment technologies could be expanded from 40% to 75% by the year 2007.

The development of energy technologies will increase the ability of the end-user to better manage energy demand, particularly during peak winter and summer periods, as well as lessen the effects of combustion equipment on the environment.

These technologies could be supplemented with smart energy systems, appropriate metering, and on-line monitoring of residential and commercial energy consumption and costs. Support could be provided through funding from the RETF, federal grants and local community-minded corporations and foundations.

Recommendation RD-2

DCEO should establish an energy technology transfer program with local public, educational, research, business and civic/community-based organizations to support the development and commercialization of promising and existing energy efficiency technologies for District of Columbia households, businesses and institutions.

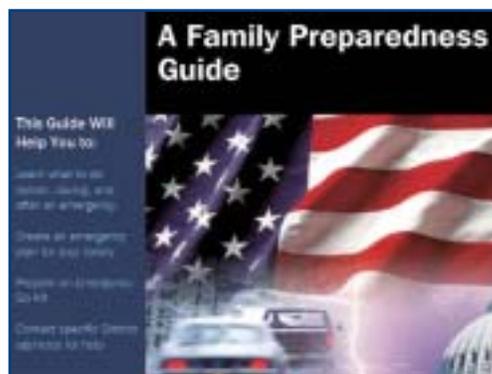
Background

This collaborative effort could include organizations such as the Washington Metropolitan Council of Governments, various regional corporate and Department of Energy research facilities, and institutions of higher learning in the District of Columbia, Maryland and Virginia. Technologies might include passive solar and siting techniques, natural lighting in architectural design, ground source heat pumps, energy efficient air conditioning, heat recovery and storage, electric power generators and computerized monitoring and control systems. Effective, simple and clear estimation techniques for determining the energy efficiency and cost benefits of such technologies and strategies also could be developed. An annual Green Energy Fair, comparable to the popular automotive shows occasionally appearing in the District, could showcase Energy Star and other technologies able to reduce energy demand, and would serve the dual role of promoting energy efficiency and economic development. RETF funds could be used to support these activities.

Emergency Planning

Goals

- To ensure the development of appropriate plans to sustain the availability of energy in case of an emergency;
- To ensure the coordination among groups involved in emergency planning, preparedness and response.



The Emergency Management Agency has produced a emergency preparedness guide to help DC residents in an emergency situation.

Overview

Until recently, the District of Columbia has been covered by several energy emergency response plans that came out of the energy crises of the 1970s. These include a Fossil Fuel Emergency Energy Shortage Contingency Plan and Set-Aside Program, a Metropolitan Washington Natural Gas Supply Emergency Alert Plan, a Metropolitan Washington Power Emergency Alert Plan, and

Washington Metropolitan Area Tri-State Energy Emergency Coordination Agreement. All of these documents were revised in the 1980s, with the Fossil Fuel Contingency Plan revision completed in October 1990.

Since the terrorist attacks on the United States on Sept. 11, 2001, the District Government revisited and revised its principal emergency response plan. The most recent draft of the District Response Plan includes an Emergency Support Function #12 (ESF #12) - Energy. ESF #12 assigns primary responsibility to DCEO for coordinating "with all other governmental department response elements and utilities to restore the District's energy systems" in the event of a natural or manmade energy emergency.

The District also has joined neighboring jurisdictions in coordinating security for the entire District of Columbia metropolitan area. The Mayor of the District of Columbia and the governors of Maryland and Virginia approved this coordination in the presence of the national Homeland Security director. This coordination is seen as vital for protecting the nation's capital. District representatives also have cooperated with regional officials through the auspices of the Metropolitan Washington Council of Governments to coordinate regional energy preparedness efforts.

States receiving funds from the U.S. Department of Energy's State Energy Program are required by the Energy Policy Act to maintain energy preparedness plans. In the last two years, several states have broadened their preparedness coverage to include electricity and natural gas, in addition to their original petroleum-based plans. States that have recently revised their

plans include Arkansas, Colorado, Connecticut, Florida, Hawaii, Kansas, Maryland, New Hampshire, Oklahoma, Rhode Island and Wyoming.

Agencies Participating in DC ESF #12
Primary District Agency
• DC Energy Office
District Support Agencies
• Department of Public Works
• Department of Transportation
• Emergency Management Agency
• Public Service Commission
Lead Federal Agency
• U.S. Department of Energy
Federal Support Agency
• U.S. Army Corps of Engineers
Non-Government Organizations
• Metropolitan Washington Council of Governments
• Potomac Electric Power Company
• Washington Gas

DCEO plans to update and consolidate the three existing, and separate, energy emergency plans in 2002. The District Response Plan's acknowledgment of DCEO's central role and primary responsibility in energy

shortage mitigation must now be reflected in a renewed District energy emergency response plan.

Emergency Support Function #12 - Energy

ESF #12 is not strictly a plan. Rather, it is a protocol incorporated as an annex to the city's general emergency plan. The primary purpose of ESF #12 is to

clarify the chain of responsibility for responding to an energy emergency. The District of Columbia's ESF #12 designates the DC Energy Office as the lead agency for managing energy emergencies. Other agencies are designated as support agencies.

Perhaps the most important function of any ESF is to ensure that all entities responding to an emergency coordinate their activities in order to hasten recovery and maximize the efficiency and effectiveness of the response. This is especially important because the restoration of energy is a complex process requiring the cooperation of many entities and may involve working under hazardous conditions. ESF #12 provides a framework that enables disparate organizations such as private sector energy companies and public sector agencies to remain in continuous contact through a centralized emergency response center. The scope of the ESF #12 includes guidance for gathering and disseminating information, facilitating the restoration of power and fuel supplies, and coordinating resources.

Fossil Fuel Emergency Energy Shortage Contingency Plan and Set Aside (Fossil Fuel Plan)

This plan contains a variety of contingency measures for mitigating petroleum product shortages, provides detailed information about the District's petroleum fuel set-aside program and describes potential stages, or levels of emergency, to which the District must respond. Although several of the petroleum shortage mitigation measures can be applied to natural gas or electricity shortages, the plan does not link petroleum shortages with other fuels. Related to this plan, and contained in its appendices, is the Mid-Atlantic and Tri-State Agreements in which the District of Columbia, Maryland and Virginia agree upon basic terminology, information sharing, and, where possible, coordination of emergency mitigation measures.

Typical of the mitigation measures for addressing a petroleum shortage include encouraging car and vanpooling, reducing lines at service stations, and a variety of other means for reducing vehicle miles traveled.

Metropolitan Washington Natural Gas Supply Emergency Alert Plan (Natural Gas Plan)

The region's January 1988 Natural Gas Plan was developed by COG in coordination with the Washington Gas Company. Patterned after the Fossil Fuel Plan, but described from the perspective of Washington Gas, its three supply deficiency emergency phases are long-term, short-term and immediate. Within each of these categories, communications protocols, emergency actions (e.g., curtailment) and restoration are discussed.

Steps outlined within this plan include requests for emergency gas from pipeline suppliers; purchase from other sources; requests for fuel switching from firm customers capable of switching to another power source; curtailment of interruptible customers; requests for conservation from selected commercial, industrial and institutional customers and the general public; and priority-based supply curtailment.

The DC Government is included in this plan as a recipient of information from Washington Gas. The various regional political jurisdictions are not assigned an active role in shortage mitigation, although the District Emergency Management Agency (EMA) Operations Center is to be operated on a 24-hour basis until the termination of the emergency and is responsible for notifying local governments. Area regulatory commissions are to be notified by the gas company and the EMA is to be kept informed of such notifications. All curtailment and restoration activities are the responsibility of the gas company, within regulations set out by the District's Public Service Commission, Virginia's State Corporation Commission and Maryland's Public Service Commission.

Metropolitan Washington Power Emergency Alert Plan (Electricity Plan)

This plan is similar to the Natural Gas Plan. It was prepared by COG in coordination with the five area electric providers at the time it was written - Baltimore Gas and Electric, Potomac Edison, Potomac Electric Power, Virginia Power and Northern Virginia Electric Cooperative. Parallel to the Natural Gas Plan, three categories of emergencies are described: capacity deficiency emergency, long-term fuel supply emergency, and power outage emergency.

The Electricity Plan describes briefly the service area, operational profile and basic emergency response organization of each participating electric distribution company and provides 24-hour telephone contact information. It

Agencies Participating in R-ESF #12
<p>State Government</p> <ul style="list-style-type: none"> • District of Columbia Energy Office • District of Columbia Emergency Management Agency • Maryland Emergency Management Agency • Maryland Energy Administration • Virginia Department of Emergency Management <p>Federal Government Agencies</p> <ul style="list-style-type: none"> • Federal Emergency Management Agency • General Services Administration • U.S. Army Corps of Engineers • U.S. Department of Energy • U.S. Department of Energy Philadelphia Regional Office <p>Energy Regulatory Commissions</p> <ul style="list-style-type: none"> • District of Columbia Public Service Commissions • Federal Energy Regulatory Commission • Maryland Public Service Commission • Virginia State Corporation Commission

also contains protocols for the mission, organization and function of local governments related to public safety in the restoration of electric power. The District Emergency Management Agency's Operation Center is assigned the role of intermediary between the utility companies and the local governments for notification purposes.

Local governments are enjoined to provide their own logistical support as required, including associated costs. Typical emergency response steps in the three emergency categories are: reduction of voltage, requests for voluntary curtailment by large companies, appeals to the general public to

shed load, requests to local government to implement conservation measures, manually activated load interruption, and power restoration efforts.

Regional Infrastructure Initiatives

Regional officials have worked through COG to evaluate energy emergency preparedness throughout the Washington metropolitan region. This effort has engaged public and private stakeholders in discussing energy vulnerabilities and suggesting ways of mitigating shortage and improving coordination. Following the lead of the Emergency Support Function annexes found in federal and state disaster plans, COG proposed a Regional Emergency Support Function (R-ESF) #12 - Energy, but one that will be primarily advisory in nature and designed to reinforce the energy emergency planning carried out by member political jurisdictions. This effort is aimed at improving area-wide energy incident reporting and information sharing. The R-ESF #12 sets up a regional protocol and entities for acquiring and disseminating information.

COG's effort is designed to provide the District and adjoining jurisdictions with in-depth information about energy emergency reactions and measures taken by the region's designated response agencies, federal government agencies, energy regulatory bodies and allied federal and state entities. All of the local jurisdictions participating in COG will be partners in the R-ESF #12. City, state, federal and regulatory agencies would also participate. A variety of private sector energy organizations will be asked to cooperate in preventing and mitigating energy shortages. These include all of the major energy companies in the area as well as petroleum dealer and service station associations.

The COG R-ESF #12 will:

- Not replace the plans and policies of local governments;
- Encourage regional energy emergency plan coordination;
- Create a Regional Incident Communications and Coordination System (RICCS);
- Be a component of a Comprehensive Regional Energy Plan being developed by the COG Energy Policy Advisory Committee;
- Facilitate and coordinate information to assist area jurisdictions with energy restoration and maintaining the continuity of essential public and private services;
- Require information sharing.

Emergency coordination among area jurisdictions is already well established. The COG R-ESF #12 may enhance and reinforce this coordination as long as it assists and does not replace or duplicate existing networks. The RICCS is the central operational entity to be created in the R-ESF #12.

Emergency Planning Recommendations

Recommendation EP-1

Regional coordination should be included in any energy emergency planning or plan revisions, and DC should participate in any regional exercises that may be undertaken by COG.

Background

Energy emergencies do not stop at jurisdictional lines. The regional nature of all energy supplied to the District should be taken into account. This regional focus includes the types of energy supply - petroleum, natural gas and electricity - plus mitigation measures. The existing Mid-Atlantic and Tri-State Agreements should be reviewed and updated if they are to be retained.

Another important aspect of regional energy emergency planning is the ongoing development of the COG R-ESF #12 protocol and its RICCS organization. While working with COG to avoid duplicating effort, DC officials also should ascertain that any regional plans complement, rather than displace, specific guidance and planning for managing power and fuel shortages affecting the District.

Recommendation EP-2

An Energy Emergency Response Plan should be prepared by updating and consolidating existing District of Columbia energy emergency preparedness plans, and appropriate training should be provided to DCEO staff and other relevant personnel.

Background

Energy disruptions and consequent shortages can be caused by a variety of incidents, including acts of nature as well as human intervention. A well-designed District energy preparedness plan will enable public officials to hasten the restoration of energy supply while keeping the public informed. As the nation's capital, the District of Columbia has a special responsibility to be security conscious and to work with the US Department of Homeland Security. Energy preparedness is an important component of any effort to protect the city and the region, and the Energy Response Plan will fill in the gaps in the Emergency Support Function #12 framework.

Regularly scheduled training of personnel who may become involved in the planning, preparedness and response to an energy emergency is crucial to the success of any plan. Orientations, workshops, tabletop exercises and drills, using state-of-the-art instruction techniques, will encourage critical thinking, emergency operation knowledge, and actual application.

The suggested following outline for a DC Energy Response Plan will help the District bring its energy preparedness planning into compliance with recent changes in the city's overall emergency protocol by updating pertinent information needed for effective preparedness.

Suggested Outline for Revised and Consolidated DC Energy Emergency Response Plan

Introduction

- Review and Check-Off Plate
- Primary Emergency Call Down List
- Description, Purpose, History
- Overview/Approach

Emergency-Related Energy Profile

- Basic Demographics from CEP III
- Basic Energy Consumption from CEP III
 - Emphasis on fuel and end-use sectors

Principal District and Regional Agencies and Authorities

- District Emergency Management Agency
- DCEO
- COG
- ESF #12
- Public Service Commission
- Energy Providers
 - Petroleum (gasoline, heating oil, liquefied petroleum gas, other)
 - Natural Gas
 - Electricity

Phases of Energy Emergencies

- Levels of Disruption Described

Energy Emergency Response Activity and Measures

- Classification of Response Measures
- Sequence of Measure to Undertake
- Mitigation Measures Associated with Phases of Emergency
- Mitigation Measures for Various Energy Sources and Cross Walk

Public Information

- Objectives of Public Information
- Communications Protocols
- Suggested Responses Appropriate for Each Stage and Fuel or Energy Source
- Dealing with Neighboring Jurisdictions and Political Authorities

Appendices

- Mid-Atlantic Agreement
- U.S. Department of Energy and NASEO
- Public Service Commission Restoration Rules
- Data about Major Energy Suppliers (location of generation, pipelines, terminals, etc.)
- Energy Company Locations/Additional Contact Information
- Model Natural Gas and Electric Company Restoration Strategies and Responsibilities
- Special needs
 - LIHEAP customers
 - Weatherization
 - Middle and long-term energy efficiency and renewable energy issues

CHAPTER III

PAST ACCOMPLISHMENTS AND CURRENT INITIATIVES

A Bit of History

Energy is a prime mover in American life. It is indispensable for industrial, transportation, commercial, residential and personal uses of every kind. The OPEC oil embargo of 1973-1974 and the interruption of supplies caused by the 1978-1979 Iranian revolution shocked U.S. consumers into realizing the consequences of relying on energy from foreign sources. The aftermath of these events marked the end of the era of secure and cheap energy and resulted in major price increases and a shortage of non-renewable sources of energy.

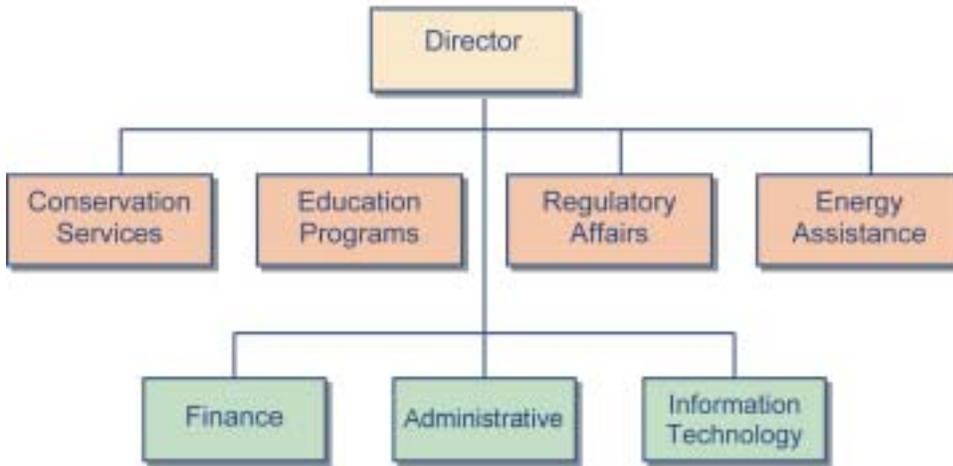
Recognizing the need to ensure an adequate and reliable supply of energy for the health, safety and welfare of the citizens of the District of Columbia, the DC Energy Office was created to advise the Mayor on current and pending energy problems, to serve as the lead agency to develop and implement the District's response to such problems, to promote the general welfare of the public by assuring coordinated and efficient management of the District's energy policy and programs, and to sustain the growth of the District's economy.

Today, the DC Energy Office functions as the state energy office for the District and strives toward permanent energy efficiency for those who work, live and play here, while in the short term providing energy assistance to the most vulnerable, particularly low-income citizens. It accomplishes all this by:

- Providing energy efficiency support for all end-use sectors (governmental, residential, commercial/industrial, institutional and transportation);
- Offering energy efficiency education and promotional activities for its customers;
- Intervening for energy efficiency in utility regulatory and legislative proceedings before the Public Service Commission and the DC Council;
- Providing help to low-income customers in paying for the cost of energy.

While statutorily created as an independent agency in the Office of the Mayor, administratively DCEO falls under the Department of Public Works (DPW), and is organized as follows:

Organizational Chart of the DC Energy Office



Over its 25-year history, DCEO has evolved to become an integral player on behalf of energy efficiency in the legislative, policy and regulatory arenas. Over that period there have been a number of changes in emphasis. The early years, quite naturally, were concentrated on dealing with petroleum shortages and conservation. Since the early 1990s, DCEO has focused on demand-side management, energy efficiency strategies, education and lifeline programs, while energy assistance has always been a part of the mix. At the dawn of the new millennium, utility deregulation and the establishment of public benefits programs presented a new set of challenges and opportunities for the DC Energy Office.

For its first 15 years, DCEO had been publishing plans and reports that provided policy direction, identified the benefits of energy efficiency and outlined steps to take in case of an energy emergency. They provided a framework for various governmental and non-governmental groups partnering and collaborating to improve the overall energy efficiency and security of the District. Also, various plans and reports were generated that highlighted the benefits derived from the reduction of unnecessary energy consumption and expenditures, the retention of money and jobs in the DC economy, and the improvement in air quality. Taken together, these plans and reports illustrate how all energy consumers in the District could attain energy efficiency and energy security. Here is a listing of such documents:

Key DCEO Planning Documents and Reports
Thirty-Five Steps: Making Conservation and Solar Work in the District of Columbia (September 1982)
Comprehensive Energy Plan #1: 1986-1990 (January 1987)
Preliminary Cost-Benefit Comparisons of Recommendations in the DC Energy Office's Comprehensive Energy Plan (February 1987)
Comprehensive Energy Plan Final Assessment (November 1989)
District of Columbia Fossil Fuel Emergency Energy Shortage Contingency Plan and Set-Aside Program (October 1990)
District of Columbia Government Emergency Energy Shortage Contingency Plan/Set-Aside Program (October 1990)
Comprehensive Energy Plan #2: 1991-1995 (September 1990 Draft)
Comprehensive Energy Plan #2: 1991-1995, Data and Sources Guide (October 1990 Draft)
Strategic Plan, DC Energy Office (Dec. 11, 2001 Draft)
Emergency Support Function #12 – Energy (April 2002)

Due to budget and staff cutbacks in the early 1990s, the production of these plans and reports was greatly curtailed. The document you are now reading, CEP III, is the keystone of a rejuvenated effort by DCEO to resume publication of appropriate "roadmaps" to making DC energy efficient.

DCEO Programs and Initiatives

DCEO's mission and vision statements form the framework and the foundation for its programs and initiatives.

Mission Statement of the Energy Office

To help improve the District's quality of life and economic competitiveness by "Making the District of Columbia Energy Efficient," i.e., a community whose residents, businesses, government and visitors routinely make informed energy choices.

Vision Statement of the Energy Office

An energy office that offers a full service, comprehensive array of well-managed programs and is recognized as a self-funded agency, a one-stop shop easily accessible to all its customers, and exemplary to the emphasis placed on energy education.

DCEO operates a number of programs that support its mission and the needs of the city. These programs have resulted in energy savings for taxpayers and residents. They all share the same purpose - to make DC an energy efficient city by establishing a framework for energy savings in the government, residential, commercial and industrial sectors, supporting energy efficiency and alternative fuels in the transportation sector, providing energy assistance for low-income households, helping to train teachers and educate students about energy usage and alternative fuels, and support changes before the DC Public Service Commission and the DC Council to encourage energy efficiency and affordable utility services for all ratepayers.

The following chart lists the various programs and initiatives undertaken by the Energy Office.

CONSERVATION SERVICES
Energy efficiency in all end-use sectors is the overarching goal of DCEO conservation programs.
CMAQ Alternative Fuel Vehicle Grants
DOE Alternative Fuel Vehicle Grants
Right Turn on Red
Ridesharing
Fuel Efficiency
Fleet Management
Promote Mass Transit
Increased Use of Bicycles
Building Code Advisory Committee Participation
Architect and Engineer Training Programs
Residential Conservation Assistance Program
Weatherization Assistance Program (WAP)
WAP Showcase Video Project
Municipal Buildings Program

EDUCATION PROGRAMS
DCEO operates public education and information programs that expand awareness about energy efficient living.
Energy Conservation Workshops
Energy Library
Energy Hotline (202-673-6750)
Energy Patrol Program
Energy Technology Workshop
Energy Curricula for Teachers and Students
Energy Auditor Course
Alternative Fuels Mechanics Training Course

EMERGENCY PLANNING
Ensures appropriate planning, coordination and response in case of an energy emergency.
District Response Plan – Emergency Support Function #12 - Energy
COG Regional Emergency Support Function #12 - Energy

REGULATORY/LEGISLATIVE AFFAIRS
DCEO efforts help the District face several challenging issues regarding electricity and natural gas.
Rate Case Intervention
Legislative Initiatives
Utility Rate Restructuring
Energy Data Repository
Gas Station Advisory Board
Janus Lifeline Project
Municipal Aggregation Program

ENERGY ASSISTANCE
Providing assistance to the city's low-income population is a priority for DCEO.
Low-Income Home Energy Assistance Program
Utility Discount Programs
- Residential Aid Discount (electricity)
- Residential Essential Service (natural gas)
- Economy II (phone calling plan)
- Link-Up America (phone connection charge)
- WASA Customer Assistance Program (water)

Conservation Services

Transportation

CMAQ Alternative Fuel Vehicle Grants - The Department of Public Works Congestion Mitigation Air Quality (CMAQ) grant program assists in acquiring alternative fuel vehicles in an effort to help eliminate U.S. dependence on imported petroleum products and to institute more reliance on alternative fuels such as abundant American natural gas, electricity and solar energy. DCEO assisted in the CMAQ effort by successfully advocating before the Public Service Commission that Washington Gas provide \$250,000 in matching funds for the initiative.



Commercial van powered by compressed natural gas.

DOE Alternative Fuel Vehicle Grants - The District of Columbia DCEO has received three grants from the U.S. Department of Energy (DOE) totaling \$153,000 to assist in purchasing alternative fuel vehicles. Two-thirds of these funds were used to provide incremental costs in the purchase of four school buses and the



DC government parking enforcement vehicle powered by compressed natural gas.

remainder is being used to assist in the purchase of two original equipment manufactured compressed natural gas (CNG) vehicle and program management activities. Specifically, the funds will assist in covering the costs needed for CNG options packages for two compressed natural gas heavy-duty street sweepers. DCEO also

supports Washington, DC's participation in the U.S. Department of Energy's Clean Cities Program through its partnership with the Metropolitan Washington Council of Governments.

Other Transportation Sector Initiatives include promoting right turn on red, ridesharing, fuel efficiency, fleet management, mass transit and the increased use of bicycles.

Commercial

Building Code Advisory Committee participation assists all sectors, especially commercial, where most of the construction activity is taking place, to incorporate up-to-date thermal and lighting standards, result in energy efficiency in new and renovated buildings.

Training Programs for professionals such as architects, engineers, facility operators and managers bring relevant information to those responsible for building energy use.

Residential

Residential Conservation Assistance Program (RCAP) provides grants to non-profit community-based organizations to purchase and install energy efficiency measures identified by an energy survey on behalf of low-income households certified as eligible for the Low-Income Home Energy Assistance Program (LIHEAP). Diagnostic equipment is used to ascertain air infiltration, pressure imbalances, and areas of heat loss. Measures installed may include caulking, weatherstripping, door sweeps, storm doors and windows, refrigerators and other cost-effective options. Energy-related health and safety conditions are addressed, particularly carbon monoxide, gas leaks and combustion venting of household appliances. Emergency repair or replacement of boilers, furnaces and hot water heaters are also performed. RCAP is funded by grants from the U.S. Department of Energy's Weatherization Assistance Program (WAP), the U.S. Department of Health and Human Services' LIHEAP, and the Reliable Energy Trust Fund created through utility restructuring.

DC WAP Showcase Video Project - In mid-FY 1997 DCEO received a \$5,000 grant from the U.S. Department of Energy to create a promotional video to highlight the major thrust of the WAP. The video provides for the public a thumbnail sketch of the overall implementation of the WAP as administered in the District of Columbia from the time of customer application to the final inspection by DCEO.

Government

Municipal Buildings Program served as a demonstration program to test the feasibility of utilizing the local electric utility, in cooperation with the Public Service Commission, as a mechanism to provide for the purchase and installation of energy efficiency measures in District of Columbia government facilities. The demonstration project provided upgraded energy efficiency measures in the Municipal Center and the Fourth District Police Headquarters.

Education Programs



DCEO workshop presenter is demonstrating how to use caulk and caulk gun. Workshops help homeowners to keep energy costs under control.

Energy Conservation Workshops feature low-cost/no-cost techniques that homeowners and renters can use to lower their fuel bills; sessions are held at DCEO and upon request to groups and organizations throughout the city.

Energy Library located at DCEO features brochures and pamphlets, as well as books, periodicals and videotapes on a variety of energy topics.

Energy Hotline serves as the agency's major clearinghouse for information on DCEO's services and programs; the Hotline number is 202-673-6750 and operates Monday-Friday, 8:30 a.m. to 4:30 p.m.

Energy Patrol Program teaches students to identify energy waste in their schools and homes. Students monitor school facilities, assisting where possible in the reduction of energy usage, and report where additional assistance may be needed. Awards are presented annually to the top three schools with the most energy savings, and certificates are given to students at the completion of each year.

Energy Technology Workshop was organized to reinforce students' math and science standards. Teachers from all over the District attended this workshop to learn about how to present to their students interesting and fun

state-of-the-art energy technology concepts that strengthen their challenges of the new millennium by showing them how to successfully join math, and science and energy technology concepts.

Energy Curricula for Teachers and Students incorporates energy efficiency concepts into science, math and resource classrooms in the DC public schools.

Energy Auditor Course for high school students is taught at Coolidge High School. In addition to classroom work and home assignments, students receive hands-on practical experience by accompanying utility auditors when they conduct residential audits for District homeowners and renters. DCEO provides equipment such as blower doors that give the students a state-of-the-art hands-on training experience. Ten students who successfully completed the Coolidge Energy Audit Training Course are hired during the summer by community-based organizations to receive hands-on practical experience in energy auditing and weatherization.

Alternative Fuels Mechanics Training Course operates at Phelps Career Senior High School. The purpose of the program is to develop a pool of mechanics in the Washington metropolitan area trained to perform general maintenance and repairs of vehicles using alternative fuels.

State Energy Program, funded by DOE, provides most of the financial resources that enable DCEO to operate its various education programs. A report published by Oak Ridge National Laboratory in January 2003, entitled Estimating Energy and Cost Savings and Emissions Reductions for the State Energy Program Based on Enumeration Indicators Data, states that the impressive savings and emissions numbers, while not precise, indicate that the SEP is operating effectively and is having a substantial positive impact on the nation's energy situation and the environment.

Regulatory/Legislative Affairs



Rate Case Intervention involves DCEO participation in cases before the DC Public Service Commission to pursue the establishment of utility rates, conservation programs and policies that foster energy efficiency and affordable service for all segments of the city.

Legislative Initiatives within DCEO entail representation before the DC Council on matters relating to energy policy programs.

Utility Rate Restructuring efforts of DCEO involve advising the District Government and residents on issues of deregulation in the electric, gas and telecommunication arenas.



This Exxon station went through the DC Energy Office's Gas Station Advisory Board to convert to a self-service station.

Energy Data Repository collects information on the District's energy supplies, consumption trends and costs, and serves as a basis of forecasting and planning.

Gas Station Advisory Board (GSAB) reviews requests by gas station dealers to convert from full-service to self-service.

The Janus Project was a DC Energy Office pilot program that saved money for Residential Essential Service (RES) customers by making cheaper natural gas available to them. With competition among gas suppliers beginning Jan. 1, 1999, DCEO wanted to make sure that low-income population were not lost. Natural gas rates change often, but the Janus Project guaranteed that eligible participants will pay 5% less for gas than they would with their regular RES discount.

DC Municipal Aggregation Program (DC MAP) - The DC Energy Office intends to be operating an electric and gas aggregate fuel purchasing program for low-income residents.

Energy Assistance



A low-income DC resident applying for energy assistance.

Low-Income Home Energy Assistance Program (LIHEAP), a program funded by the U.S. Department of Health and Human Services (HHS), helps low-income residents meet their home energy needs, and provides emergency assistance to households whose electric or gas services have been terminated or households that

are without fuel oil and have been denied fuel oil delivery. The amount of assistance is based on household size, total household income, fuel type, and type of residence. LIHEAP is a national program funded by the U.S. Department of Health and Human Services, and makes home energy bills more affordable. It is the last line of protection against the ever-escalating home utility bills and the resulting disconnection or denial of service accompanying unaffordability. Each year between 15,000 and 19,000 low-

income District of Columbia residents are provided energy assistance through the LIHEAP. Applying for assistance is done primarily by calling the Energy Hotline to schedule an appointment for intake at DCEO. In addition to that main method of receiving LIHEAP applications, many more are taken at senior sites that the LIHEAP staff schedule to visit during late summer months each year. Still others are received at the annual Utility Discount Day program in October. This event involves various utility companies and DCEO coordinating in a joint effort at the Convention Center to accept applications both for individual discount programs as well as for the LIHEAP, all on one application form. In addition to the financial assistance afforded to these eligible applicants, the LIHEAP also provides fans during deadly summer heat waves and heaters and blankets during the winter season.

Utility Discount Programs offer special discounts on utility services for District of Columbia customers certified as LIHEAP-eligible by DCEO:

- Residential Aid Discount (RAD) offers a discount to eligible PEPCO customers on their electric bills;
- Residential Essential Service (RES) offers qualifying Washington Gas customers a discount on natural gas used from November through April;
- Economy II (ECON II) offers qualified senior citizens and heads of households with dependents discounts on their local Verizon DC telephone bills;
- Link-Up America offers qualified citizens a discount on service connection charges associated with installing a single phone line in their home;
- WASA Customer Assistance Program offers qualified homeowners an exemption from water service charges from the Water and Sewer Authority in the amount of 400 cubic feet per month.

Emergency Planning



An emergency management staff answers a call for help.

The District Response Plan, which includes Emergency Support Function #12 - Energy, has been developed since the Sept. 11, 2001 terrorist attacks on the United States to coordinate with other government departments and utilities to restore the District's energy systems in the event of a public emergency.

A Regional Emergency Support Function #12 - Energy, being developed in coordination with the Metropolitan Washington Council of Governments, will

facilitate communication and coordination among area jurisdictions concerning regional energy issues and activities following an emergency.

Some DCEO Success Stories

DCEO's programs have generated some noteworthy results, from reducing energy costs for the District Government to educating the next generation of energy consumers, from lowering the energy consumption of low-income houses to increasing the use of alternative fuel vehicles, and from trimming energy consumption in schools through student energy patrols to empowering energy consumers to pay the best price for their energy through aggregation programs.

Conservation

DCEO's conservation activities such as the weatherization of low-income homes programs, the implementation of energy auditing technology initiatives, and securing of grants to develop policies and programs are helping residences and businesses across the city reduce their energy consumption.

- Creatively financed more than \$2 million in energy conservation measures in the Municipal Center and Fourth District Police Headquarters, reducing the consumption of electricity by over 25%;
- Weatherized more than 6,000 low-income residences to date, one-third of which have been multi-family. Annual savings to customers for the 916 homes weatherized in FY 2001 is estimated at \$196,688;
- Invested over \$1.3 million to make the DC Government fleet a leader in the use of alternative fuels, responsible in large part for the 177 such vehicles on the road;
- Won a purchase assistance grant in partnership with DPW/Fleet Management and the Metropolitan Washington Clean Cities Partnership to expand by 10 to 15 the number of dedicated compressed natural gas vehicles used by Parking Enforcement;
- Through 16 grant cycles, awarded over \$5 million in federal matching grants to over 100 schools, hospitals, local government and public care institutions to perform energy studies and install conservation measures in their buildings, saving them an estimated \$3 million in energy costs each year;
- Instrumental in the process of adopting the 2000 Energy Conservation Code for new and renovated buildings, which will ensure the energy efficiency of more than \$1 billion in residential and commercial construction per year;
- Coordinated presentation of workshop on energy conservation operation and maintenance procedures for the Blue Plains Wastewater Treatment Facility, one of the DC government's largest users of electricity;
- Sponsored courses for local architects and engineers, taught by the American Institute of Architects, which included hands-on computer-based energy analysis; attended by 80 participants;

- Conducted an energy conservation workshop for owners, managers and operators of commercial, office and apartment buildings; participants were responsible for over 2.5 million square feet of property;
- Researched and wrote a number of papers on energy efficiency issues affecting the residential, institutional and government end-use sectors in the District, conducted under the auspices of the Urban Consortium Energy Task Force of Public Technology Inc. as part of its technology transfer initiative;
- Installed new energy auditing software for multi-family and single-family homes designed to recommend energy efficiency improvements;
- Designated as lead agency to respond to emergencies affecting the District's energy systems, and helped develop a plan to carry out this responsibility in coordination with other government agencies (District and federal), the utility companies, and COG, the regional coordination body.

Education

In the education area, DCEO continues to play an active role in expanding energy awareness among schoolteachers, students, residents and businesses. DCEO recognizes that developing energy awareness is the first step toward energy conservation.



DC School student inspects the model electric car she built to race against other students in the National Tour De Sol held on the mall.

- Involved more than 185 DC elementary, middle and junior high schools classrooms in the Energy Patrol Program, allowing students to patrol and monitor their schools to identify and report areas where energy is being wasted;
- Energy curriculum is currently presented in approximately 200 DC classrooms, with science, math and resource teachers trained in incorporating energy efficiency techniques in classroom instruction;
- Established energy auditor class at Coolidge High School and alternative fuel vehicle mechanics training course at Phelps Career Senior High School - a minor-league feeder system for the next generation of energy professionals, with students who successfully complete the courses being offered jobs by local businesses in the energy improvement field;
- Provided energy training to hundreds of primary and secondary public and private schools students through the National Energy Education Day program;
- More than 150 science and math teachers were trained to build miniature electric vehicles, increasing the knowledge base of both the instructors and the students. One of the elementary school students broke the

record in the national Tour de Sol for racing the vehicle at a 55-degree angle in the uphill race;

- Distributed thousands of energy conservation kits, containing over \$100 worth of easy-to-install energy materials for the home, to LIHEAP clients;
- Brought on line the DC Energy Office website (www.dcenergy.org) to provide general information about the office and the programs it offers;
- Awarded over 100 small grants of up to \$3,000 each to local individuals and organizations to perform innovative energy projects (such as newsletters, brochures, energy fairs, seminars, videos and instructional manuals) that met neighborhood needs;
- Operates the DC Energy Hotline, the agency's information clearinghouse on DCEO's programs and services, handling approximately 85,000 calls per year;
- Put in place a Used Oil Recycling Program for DC residents in which 68 gas stations agreed to serve as collection sites for used motor oil and three additional collection sites were set up;
- Established a Speakers Bureau, consisting of volunteers from District Government agencies and local utilities who are available on request to address community and civic groups on energy-related topics;
- Created an energy library, open to the public, featuring books, periodicals and videotapes on a variety of energy subjects.

Regulatory Intervention

In the regulatory and legislative arena, DCEO has been moving forward with the aggregate purchase of electricity by DC agencies, promoting policy and administering programs for low-income energy consumers, and processing applications to ensure timely access to benefits available from the regulatory process.



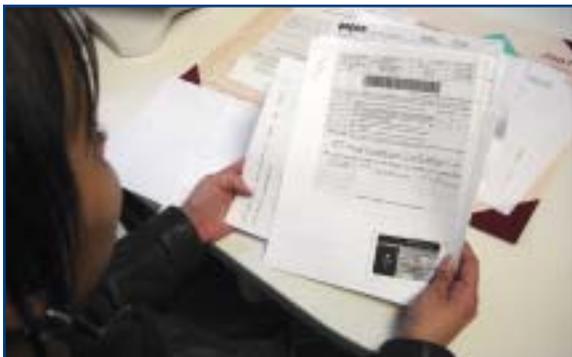
Over 5,000 DC residents wait to apply for energy assistance and utility discounts at the Utility Discount Day at the Convention Center.

- Commenced the implementation process for the DC Council-mandated DC Municipal Aggregation Program (DC MAP) that will allow the District Government to consolidate the purchase of electricity in partnership with other agencies, nonprofits and residential customers, thus saving taxpayer and citizen dollars;
- Conducted the Janus pilot gas aggregation grant project for 1,300 low-income customers wherein they received cost reductions ranging from \$142 to \$189 under the Public Service Commission-mandated Residential Essential Service program;

- Expanded the Residential Aid Discount (discount on electric bill) program and put in place a water discount program in partnership with the Water and Sewer Authority (WASA);
- Began implementation of an electric and gas pilot aggregation program for low-income citizens;
- Processed utility discount applications for 12,465 electric, 7,148 natural gas, 12,790 telephone and 1,304 water customers during FY 2001;
- Launched the Residential Energy Assistance Challenge (REACH) program, funded by HHS and designed to empower low-income households to achieve energy self-sufficiency in light of the restructuring of the electric and natural gas markets in DC and the volatility in home energy prices;
- Conducted three surveys (1980, 1989 and 1991) to determine the number and type of operating service stations in the District, designed to assist the Gas Station Advisory Board to balance the needs of drivers with the movement of the oil industry to convert to gas-and-go; currently being updated;
- Intervened in every energy-related case and every telecommunications case involving Economy II before the DC Public Service Commission (PSC) since the establishment of the Energy Office in 1981, representing the interests of the Government of the District of Columbia and its low-income citizens;
- Involved in designing a number of least-cost planning programs under PSC Formal Case 834 to determine alternatives to additional supplies of electricity and natural gas to meet increased demand, including the Residential Conservation Service (RCS) and the Commercial and Apartment Conservation Service (CACS).

Energy Assistance

DCEO continues to ensure that all who are eligible and would like to avail themselves of energy assistance receive that help. Through expanded outreach and improved application processing, DCEO provides quality service to its clients.



A DC resident reviews her application for energy assistance.

- Served a total number of 18,879 low-income DC households with energy bill-paying assistance in FY 2001 under the Low-Income Home Energy Assistance Program;
- Took applications for a record 4,762 citizens for energy assistance and for gas, electric and telephone discounts on Utility Discount Day in October 2001; more

- than 95% of the applicants were approved;
- Temporary Assistance for Needy Families (TANF) program transferred \$1.5 million to the DPW/DCEO Low-Income Home Energy Assistance Program that allowed for the agency to assist approximately 3,624 additional customers with children in their homes;
- Distributes about 400 free electric box fans during the summer months to the households of eligible LIHEAP clients wherein reside anyone who is 60 years or older, 5 years or younger, or with a medically documented respiratory ailment;
- Provided monthly energy assistance, under the Complementary Energy Assistance Program (CEAP), to approximately 2,000 eligible low-income working families with dependent children.

Support Functions

- Migrated from a Digital VAX mainframe environment to a PC-based Local Area Network, then to a Wide Area Network enabling electronic communication with public and private sector entities;
- Implemented a major project that replaced computer hardware and software for processing applications for energy assistance and utility discount programs (UDP) and incorporated weatherization and UDP into a single computerized intake form;
- Developed Visual Basic database applications for LIHEAP, UDP, RCAP, REACH, weatherization kit tracking and the Energy Hotline, allowing more efficient program management and delivery of services to clients and providing the capability of generating statistical data in a number of report formats;
- Received certificate of commendation from the DC Controller for excellence in financial reporting for a small agency for three consecutive years;
- Built capacity to more effectively deliver services to the public by encouraging staff members to advance themselves by taking at least two trainings per year customized to their particular area of responsibility, as well as obtaining higher education that relates to the needs of the office;
- After being in operation for 25 years and having received millions of dollars in grants and other funds, the DC Energy Office has never had any disallowed costs, and no funds ever had to be returned.

DCEO's Regional, National and International Leadership Roles

The DC Energy Office has consistently sought to impact not only the District but also the entire metropolitan Washington region. First and foremost, it cooperates with and through the Metropolitan Washington Council of Governments. The Clean Cities program intentionally is operated as a regional initiative, not just as a DC-specific program, even though DCEO technically is the lead agency. Additionally, DCEO reports to DOE's Philadelphia Regional Office concerning all federal grant matters, and as a result, foster day-to-day working relationships with neighboring mid-Atlantic states.

The DC Energy Office strives to impact the entire country with its various plans, policies and programs. Frequently this plays out by being responsive to our national leaders, be they the President or the Secretary of Energy. Two presidents, Carter and Clinton, have specifically singled out DCEO programs as exemplary throughout the United States. In addition, DCEO's nationwide impact is made through national organizations such as the National League of Cities and the International City/County Management Association, at the state level with the National Association of State Energy Officials (NASEO), and at the local level with the Urban Consortium Energy Task Force (UCETF).

The DC Energy Office has - no doubt at least partially because it serves as the capital city of the United States - frequently been requested to facilitate the exchange of energy efficiency technology or programs with other countries. Prime examples of this international cooperation include hosting energy leaders from numerous Latin American and African nations, and visiting Rostov-on-Don and Moscow, Russia; Paris, France; and Shanghai and Beijing, China, among other foreign cities, to share the expertise of the DC Energy Office.

Conclusion

DCEO is justifiably proud of its accomplishments and the progress the District has made toward becoming an energy efficient city. It is also continuing its legacy of solidly managing programs that offer cost-effective services to DC citizens across a wide spectrum of energy needs. However, as the following chapters of CEP III point out, there is still much to be done. The 43 recommendations that cover the various energy sectors - Government, Residential, Commercial/Industrial, Institutional and Transportation - and the recommendations that cover the special strategies - Energy Assistance, Education/Public Information, Regulatory Intervention, Research and Development, and Emergency Planning - outline a series of steps for the District to enjoy a bright energy future.

CHAPTER II

AN ENERGY PROFILE OF THE DISTRICT OF COLUMBIA

This chapter provides a profile of the District of Columbia for the period beginning in 1980 and ending in 2000. It includes data on income, population, employment and construction activity, plus information on overall energy consumption and a breakdown of consumption by energy source. This information is provided in order to give the historical context necessary for the reader to better understand later chapters.

DC Income, Population, Employment and Construction Changes

In general, the 20-year period from 1980-2000 typifies one of great economic prosperity. The District saw stable growth in the local economy, homeownership rates and per capita income levels, and expanded office construction. However, over the same period, the District saw the population decrease and a decline in the number of housing units, while citywide energy consumption remained steady.

Gross domestic product (GDP) for the District - the market value of goods and services produced in the city - rose steadily from 1980-1999. The growth was most substantial in the 1980s, but continued steadily throughout the 1990s. For the period 1990-1999, GDP increased 38%, an average of almost 4% per year. Figures II-1 and II-2 present this data. As will be noted, the District expanded its production of goods and services at a rapid rate at the same time that there was no major increase in citywide energy consumption or major increases in energy prices.

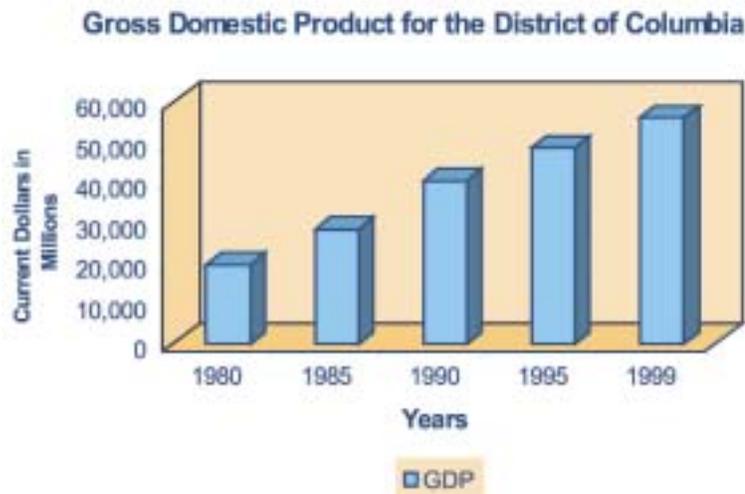


Figure II-1

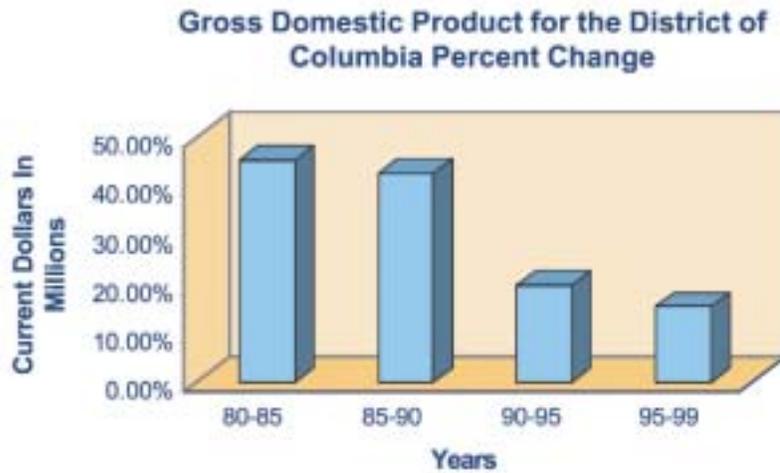


Figure II-2

Household income is another good indicator of how families and individuals are faring economically. In the District, from 1990-1999 (the most recent year for which data is available), the median household income for households in the greater Washington region rose from \$43,198 to \$68,229 (adjusted to year 2000 dollars), an increase of 58%.

The population in the District declined significantly in the last 20 years. In 1980, the population was 638,333. By 1985, the District had lost 10,935 residents, another 20,520 residents from 1985-1990, and 52,372 more residents were lost by 1995. The population dropped as low as 519,000 in 1999 and rebounded back up to 572,059 in 2000. Figure II-3 shows the trend.

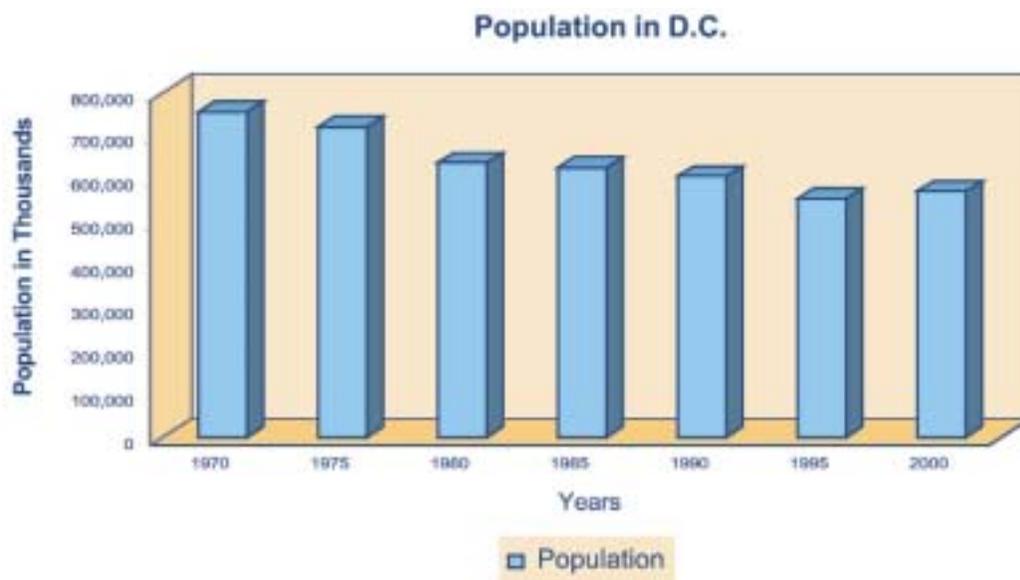


Figure II-3

In 1980, there were a total of 277,000 housing units in the District of Columbia. By 1990, there were 278,489 housing units, with an average of 2.26 persons per household. Nearly 50% of all households in the District consisted of single persons living alone. 2000 figures demonstrate a continuance of this trend, with the number of housing units down to 274,845 and slightly more than 50% of those households consisting of single persons living alone. In 2000, the average number of persons per household had decreased to 2.16. From 1980-2000, homeownership rates inched upward from 35.5% in 1980, to 38.9% in 1990 and to 40.8% in 2000.

Based on 2000 Census data, the District of Columbia had an annual median family income of \$46,283, while the national median was \$50,046. In the District, 19,365 families (16.7%) and 109,500 individuals (20.2%) were living at or below the federal poverty guideline. For example, this guideline for a family of four in 2000 was \$16,700 per year. Although middle- and upper-income households constitute the largest components of the Residential Sector, it is low-income households that are most vulnerable.

Although the total District of Columbia population declined from 606,900 in 1990 to 572,059 in 2000, it is projected to increase to 611,000 by the year 2005, to 650,000 by the year 2015 and to 702,000 by the year 2025. Residents thus constitute a major end-use sector in the District of Columbia. Therefore, energy consumers have a significant stake in energy programs and strategies emphasizing energy consumer education, energy efficiency programs such as weatherization, efficient home energy appliances, and the promotion of renewable energy sources.

Employment trends in the District also characterize the dynamics of economic activity. The public/private sector job mix has changed dramatically since 1980. While many public sector jobs were eliminated over this 20-year period, the private sector more than compensated for the loss by creating a significant number of jobs as a result of federal spending.

As noted in the Commercial/Industrial Sector, there has been an unprecedented increase in commercial office space, with almost 42 million square feet added from 1980-2000, and the rate of expansion is projected to continue over the next five years. Although the Industrial Sector is small in the District, the energy consumption in that sector is still expected to rise as production equipment ages.

The types of business that comprise the District's economic base are all growth business areas that increase the demand for energy resources. In the

District, four business categories represent 52% of the total establishments and 61% of the employees in the service. These businesses are:

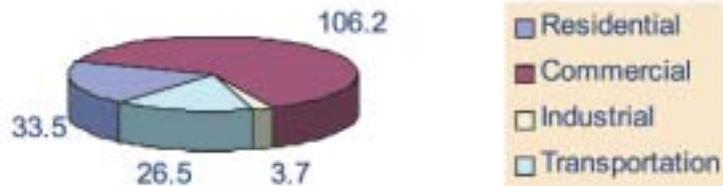
- Professional, scientific and technical services
- Accommodations and food services
- Health care and social assistance
- Other services

Energy consumption in the Residential Sector has remained relatively flat in the District of Columbia during the 1990s (in trillions of Btu, 34.4 in 1990, 36.3 in 1995, and 33.5 in 1999) despite economic prosperity and increased total and per capita incomes. There are several key factors that will be driving residential energy demand in the District over the next five years:

1. Continued increases in residential electricity and natural gas consumption in both single-family and multi-family dwellings in the District of Columbia;
2. Public Service Commission orders in Formal Case No. 945, effective Jan. 1, 2001, giving all residential and commercial retail electric customers in the District of Columbia the option of selecting an alternative generation and transmission supplier, while the Potomac Electric Power Company (PEPCO) continued to be the sole distribution company;
3. The authorization by the Public Service Commission, through gas tariff GT96-3, allowing all District residential customers to choose their commodity natural gas supplier since Jan. 1, 1999, while Washington Gas remains the sole distribution company;
4. Projected increases in the residential population of the District of Columbia resulting from and causing new single- and multi-family housing to be built and thereby increasing energy demand, particularly for natural gas and electricity;
5. Projected increases in the number and diversity of poor households in the District of Columbia requiring energy-related financial and service assistance from utilities and the District of Columbia Government.

Figure II-4 shows the 1999 energy consumption and energy expenditures in the District of Columbia, by sector, based on data from the Energy Information Administration.

**DC Energy Consumption by Sector - 1999
(trillion Btus)**



**DC Energy Expenditures by Sector - 1999
(million nominal dollars)**

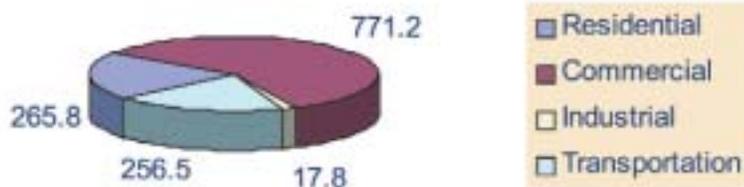
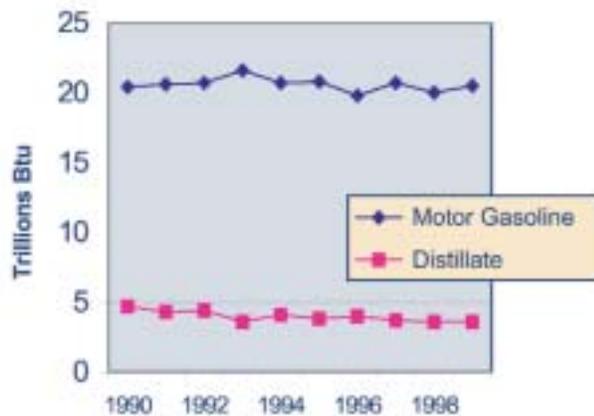


Figure II-4

As can be seen, energy consumption in the Transportation Sector accounts for 26.5 trillion Btu, or 15% of the total 170 trillion Btu of energy used annually in the District. This breaks down into approximately 167.1 million gallons of motor gasoline, 26.5 million gallons of distillate (diesel fuel for trucks and buses primarily); 2.4 million gallons of lubricant and approximately 120,000 gasoline gallon equivalent (GGE) of natural gas. Energy consumption in the Transportation Sector has remained virtually unchanged since 1980. The amount of motor gasoline sold in the District dropped about 18% from 1960 to 1999 but leveled out in the 1990s (see Figure II-5). Distillate consumption for

transportation also remained relatively steady. There were no significant natural gas sales for vehicle use in 1960. While fuel sales to, and transit ridership by, residents of the District diminished, traffic and transit associated with suburban commuters increased.

**District of Columbia Motor Fuel Consumption
Estimates 1990-1999**



US Energy Information Administration
State Energy Price and Data Report 1999

Figure II-5

The District's Overall Energy Profile

When the first Comprehensive Energy Plan was drafted in the mid-1980s, it proposed to rectify the circumstances prevalent in "the new energy era," the time from 1970 to 1982 noted by severe increases in energy prices, changes in energy supply, growing energy consumption and the emerging importance of air quality and environmental protection due to the burning of fossil fuels. The aforementioned are all characteristics that began with the oil embargo of 1973. In like manner, during the 1980s and 1990s, the Iraq-Iran War and the Gulf War had the effect of impacting price changes in energy. As shown in Table II-1, prices have increased in all but the Industrial Sector over the period.

Energy Price Estimates for the District of Columbia for Four Sectors, 1980 - 1999 (in Nominal Dollars per Million Btu)				
Year	Residential	Commercial	Industrial	Transportation
1980	7.04	8.61	10.2	9.44
1985	9.59	12.91	17.1	9.93
1990	9.39	11.73	14.68	10.24
1995	11.12	13.89	11.02	10.51
1999	12.18	15.35	8.96	10.23

Table II-1

Overall, total energy prices have increased from \$8.72 per million Btu in 1980 to \$13.23 per million Btu in 1999 in terms of nominal dollars. Figures II-6 and II-7, based on data from the Energy Information Administration, depict energy prices and percent changes during this period.

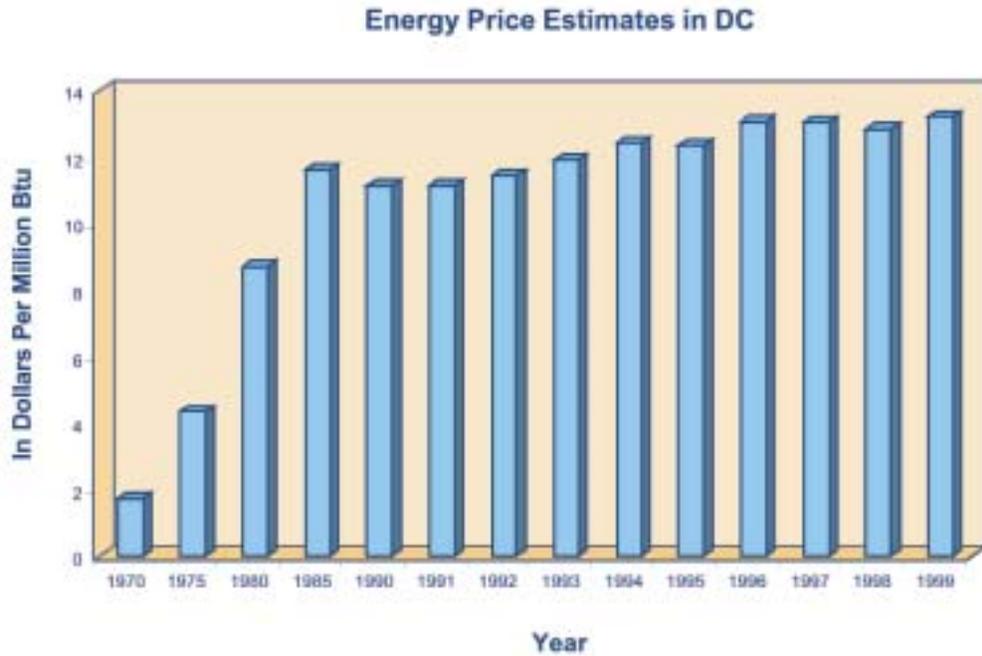


Figure II-6

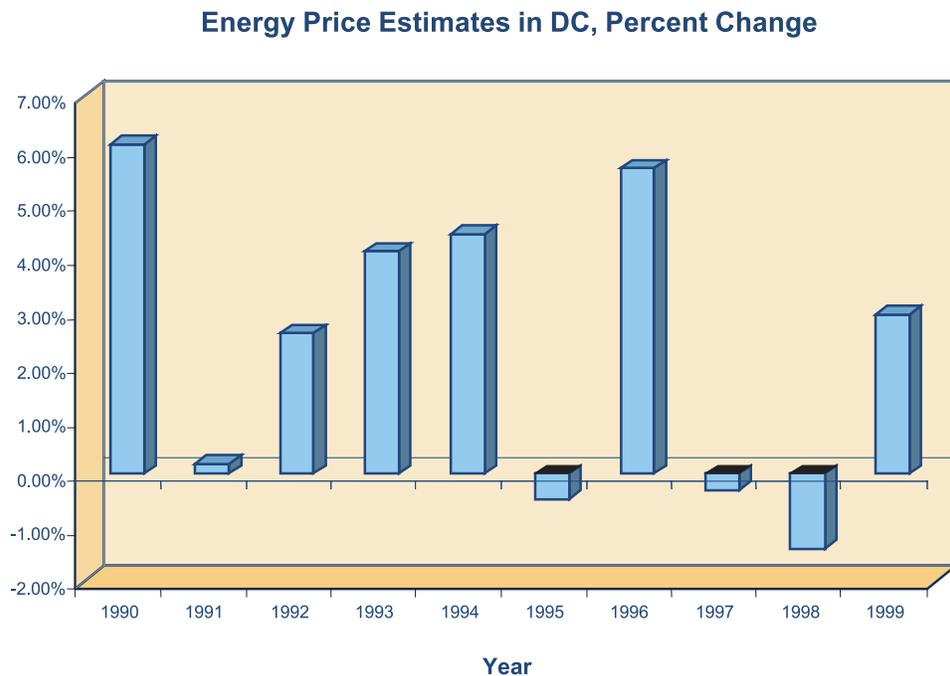
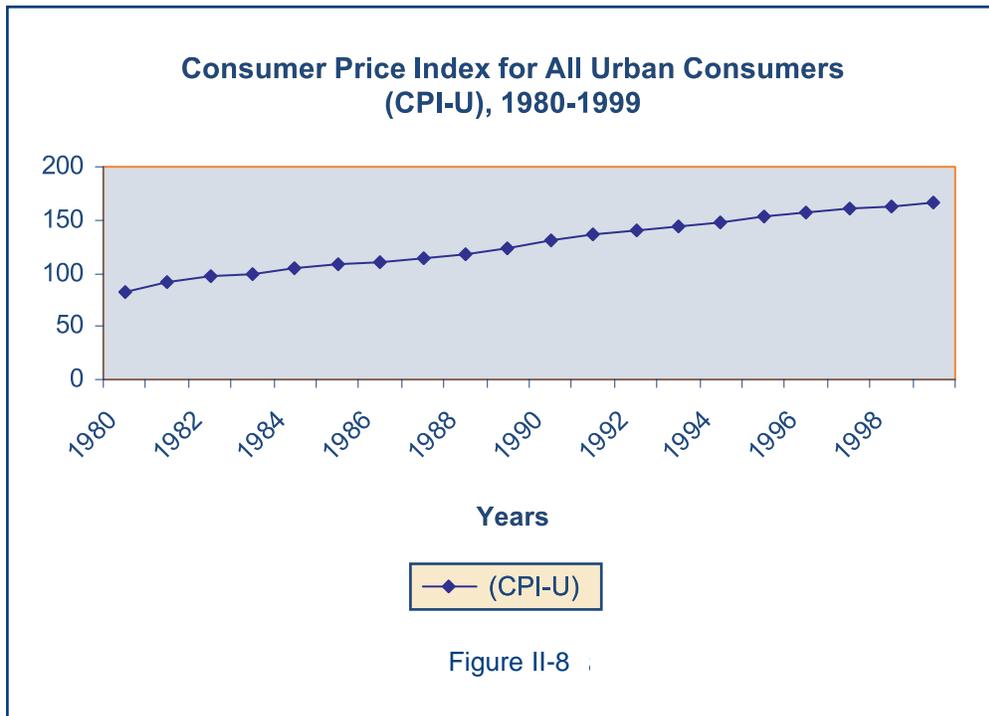


Figure II-7

The consumer price index (CPI) for all urban consumers prevailed at 82.4 in 1980 (1982-1984 = 100) and ascended 84.2 points to 166.6 in 1999. Figure II-8 displays CPI for urban consumers for each year of the period 1980-1999. In terms of real dollars, since 1980 the CPI has outpaced energy prices.



The period-to-period analysis of energy prices (in nominal dollars) indicates the rate of increase is declining. Table II-2 shows the period-to-period percentage change in energy prices for the District. Initially, prices increase, decline slightly and then increase again, however, at a decreasing rate. In 1980, prices were \$8.72 per million Btu. By 1985, they had increased to \$11.61 per million Btu, decreased to \$11.12 per million Btu by 1990, and then began its ascension again to \$12.37 per million Btu in 1995 and to \$13.23 per million Btu in 1999.

Energy Prices in the District of Columbia for Four Sectors 1980 - 1999				
Period-to-Period Percentage Change				
Year	Residential	Commercial	Industrial	Transportation
1980-1985	36%	50%	68%	5%
1985-1990	-2%	-9%	-14%	3%
1990-1995	18%	18%	-25%	3%
1995-1999	10%	11%	-19%	-3%

Table II-2

Total energy consumption in the District has remained rather constant during the 1980s and 1990s, notwithstanding a slight increase. Consumption grew 10.9% between 1980 and 1999, rising from 153.1 trillion Btu to 169.8 trillion Btu. Figures II-9 and II-10 illustrate energy consumption for this period. The District's residential, commercial, industrial and transportation sectors consumed Btu directly through the use of coal, natural gas and petroleum products. The electric utility used coal, oil and natural gas to generate electricity.

Energy Consumption Estimates in DC

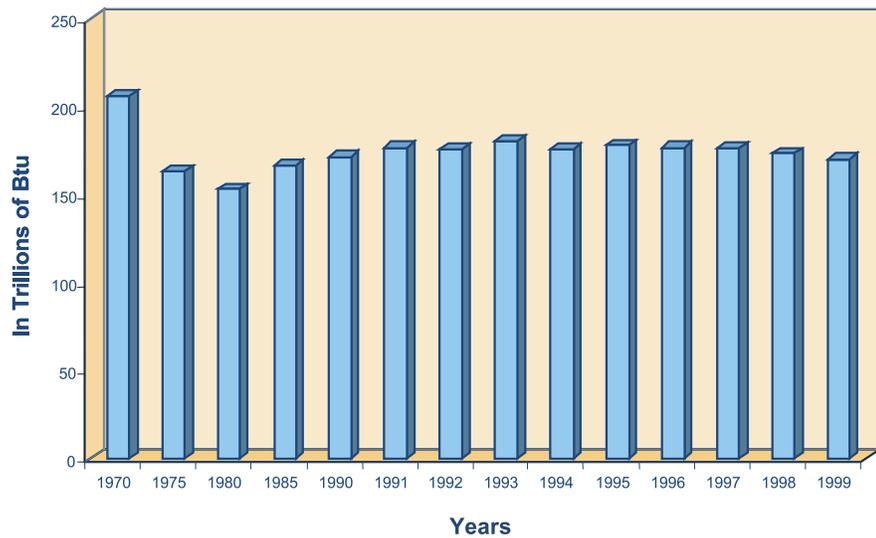


Figure II-9

Energy Consumption in DC, by Type

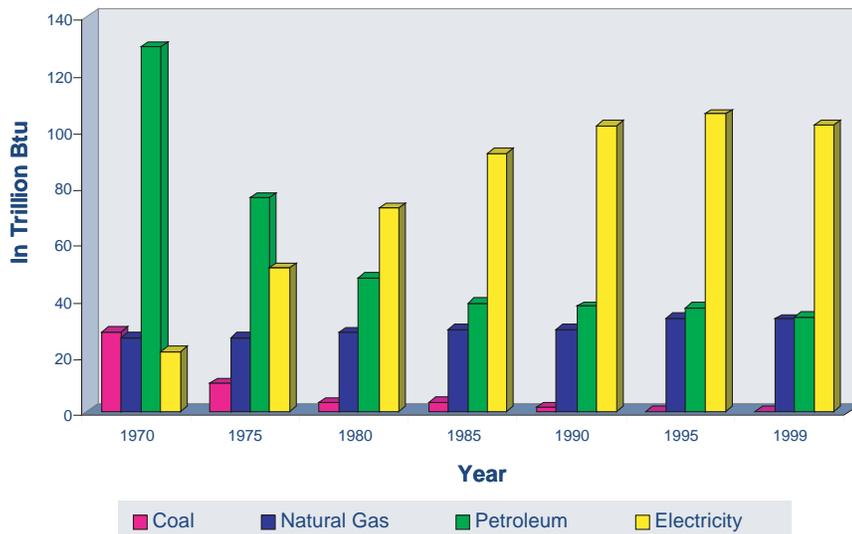


Figure II-10

So how does the District fare in comparison to the other 50 states? In 1999, the District of Columbia was ranked first as paying the highest prices for energy. The District paid \$13.23 per million Btu while the national average was \$8.41 per million Btu. However, more telling is the sixth-place ranking in per capita expenditures; the District spent \$2,526 per person on energy, while the national average was \$2,049 per person. Finally, the District was ranked 31st in per capita consumption. While the consumption rating is good among the states, the District ranked 39th in the same category in 1983, indicating the importance of reducing energy consumption per the recommendations in this Plan. As well, energy prices must be restrained. The District ranked second, third, seventh and 12th for prices paid for natural gas, petroleum, coal and electricity, respectively.

DC Energy Consumption by Energy Source

Economic trends in the District of Columbia influence energy demands which, in turn, affects consumption patterns, prices and expenditures. Figures II-10 and II-11 show the trends in energy consumption by fuel type from 1970-1999. The changes in the amounts and types of fuels used in the District result from a number of factors, including governmental air quality provisions, innovations in green technology, the politics of oil and the prices of commodities.

DC Energy Consumption Percent Change by Fuel Source

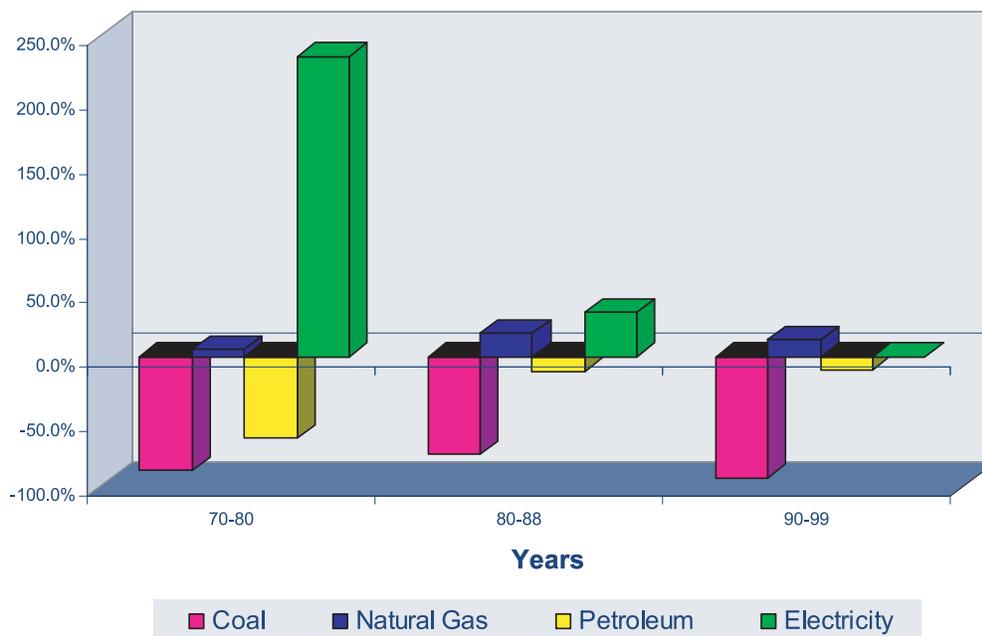
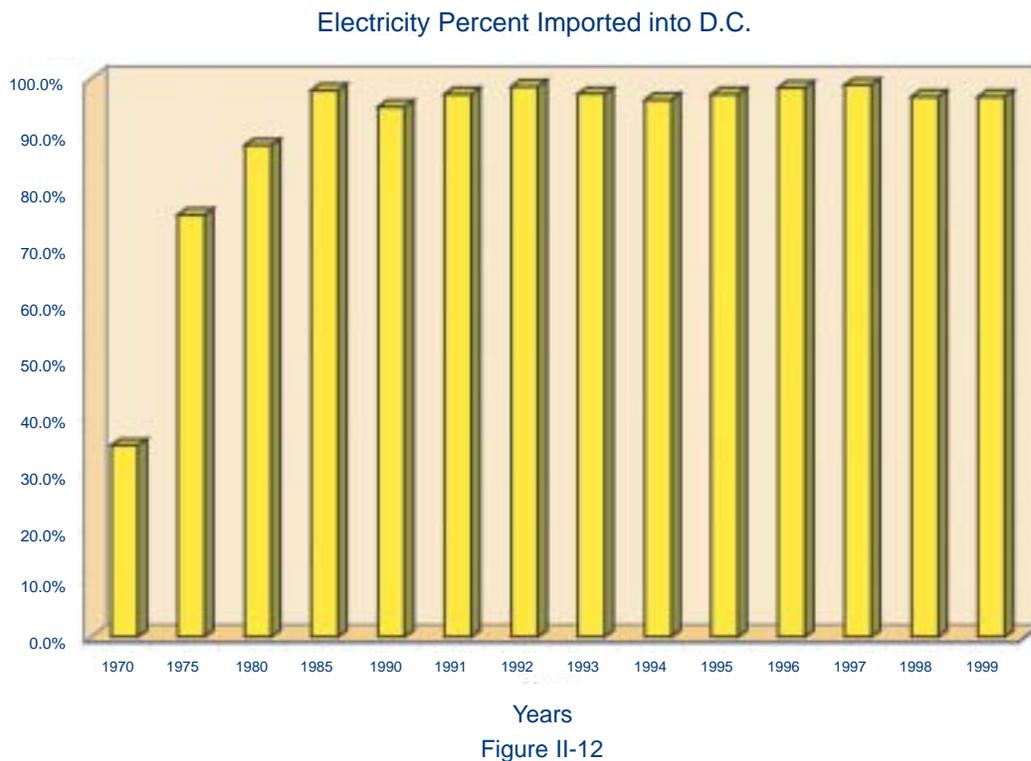


Figure II-11

In 1999, there were (and still are) two oil-fired generating plants in the District of Columbia: Benning Road, a 550-megawatt plant, and Buzzard Point, a 256-megawatt plant, both peaking units. Originally burning both coal and oil, in the mid-1970s they were converted exclusively to oil, which is now the only energy source used in the generation of electricity in Washington, DC. Nevertheless, dependence on the generating stations in DC has dwindled significantly, with most of the electricity supplied to customers in the District of Columbia being produced by coal-fueled power plants located in Maryland. PEPCO is an active member of the PJM Interconnection, the regional power pool, which oversees the operation of the largest wholesale electricity market in the United States. The PJM structure helps ensure an adequate supply of electricity within the region and the economically optimal use of available generating and transmission facilities. With PEPCO having sold the majority of its generation units to Mirant, the supply mix in the District in the future may very well differ from historical patterns as a result of restructured competition and new energy suppliers.

While electricity as a share of total energy consumed in the District increased from 47.8% in 1980 to 60.5% in 1999, energy input at the electric utility shows a decline. Figure II-12 shows the increase in net imports from 1970 to 1999. According to the State Energy Data Report, in 1980 energy input at generation was 9.8 trillion Btu. By 1985, input decreased to 2.0 trillion Btu, increased in 1990 to 5.4 trillion Btu and decreased again in 1995 to 3.0 trillion Btu. Input was 3.4 trillion Btu in 1999. Table II-3 shows the details of gross electricity sales in the District for the period 1970-1999.

Increase in the demand for electricity and the siting of new generating facilities in Maryland explain the decrease in electric production in the District of Columbia and the increase in interstate receipts over the period. This was further contributed to by the emergence of cogeneration projects and new purchased power contracts that began in 1987. Purchased power increased 224% between 1987 and 1988 when the Federal Energy Regulatory Commission approved a long-term firm capacity and energy contract. As a result, DC has access to 450 megawatts from two utilities in Ohio. There is approximately three years left on the contract. Washington Gas also began demonstration cogeneration projects in 1991.



Gross Electricity Sales for the District of Columbia (in trillions of Btu)							
	1970	1975	1980	1985	1990	1995	1999
Energy Input	41.4	16.5	9.8	2	5.4	3	3.4
Net Sales/Losses	21.6	51	72.2	91.9	101.7	105.6	101.8
Gross Sales	63	67.5	82	93.9	107.1	108.6	105.2
Percent Imported	34.3%	75.6%	88.0%	97.9%	95.0%	97.2%	96.8%

Table II-3

Petroleum consumption dropped 14.1 trillion Btu over the period from 1980-1999. The District consumed 47.7 trillion Btu of petroleum in 1980, 38.6 trillion Btu in 1985, 37.3 trillion Btu in 1990, 36.9 trillion Btu in 1995 and 33.6 trillion Btu in 1999. The share of total energy consumption relying upon petroleum went from 31.5% in 1980 to 20.0% in 1999.

Beginning with the Clean Air Act of 1963 (PL 83-206), federal law and rules were approved and amended requiring areas of the country with unacceptable levels of air pollution - especially ozone, nitrous oxides (NOx), sulfur oxides and volatile organic compounds - to plan and take significant steps to reduce air pollution. Among these requirements was the use of reformulated motor gasoline designed to lower harmful emissions. The District of Columbia now consumes 80.3 million gallons of reformulated motor gasoline, or just under one-half of all motor gasoline sold here.

The decrease in motor gasoline use may be the result of a number of factors. One is the apparent trend toward greater Metro ridership from locations outside the District. Another is the turnover in the vehicle fleet. Although Congress failed to raise federal Corporate Average Fuel Economy (CAFE) goals in 2002, the simple replacement of older vehicles with newer more efficient models appears to have helped reduce consumption. A decrease in motor fuel sales may also be caused by the reduction in service stations from 141 in 1987 to 109 in 2000 (and from 270 in 1977). However, if planned construction and housing initiatives draw new residents into DC, motor fuel consumption may be expected to stabilize, if not rise slightly.

Over the twenty-year period, natural gas consumption increased modestly due to the growth in the commercial sector. In 1980, consumption was 28.0 trillion Btu. It increased in 1985 to 29.4 trillion Btu, decreased somewhat to 29.2 trillion Btu in 1990, increased again to 33.2 trillion Btu in 1995 and decreased slightly to 32.9 trillion Btu in 1999. Natural gas accounted for 19.5% of total energy consumption in DC in 1999 - relatively the same as in 1980 when it was an 18.5% share.

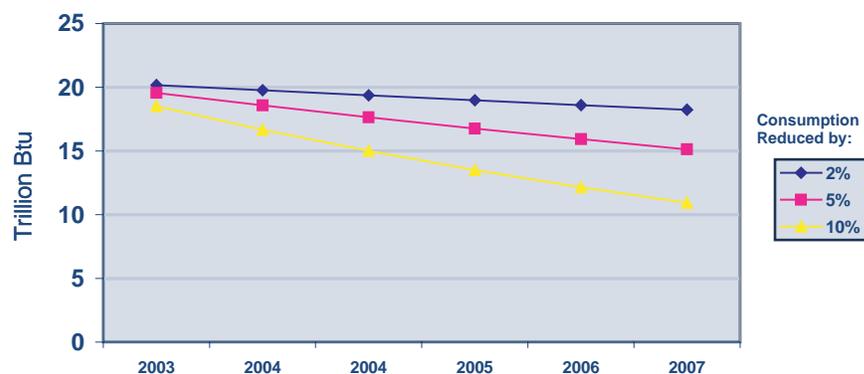
In 1980, coal consumption was 3.3 trillion Btu. Since then the District has seen a rapid decline in the use of this fuel. By 1990, consumption had decreased to 1.7 trillion Btu and to 0.1 trillion Btu in 1995 and 1999. Coal has historically been used in the District to generate steam.

Where Do We Go from Here?

This Plan should not only right the wrongs of the past; it must also be poised to circumvent adverse effects, as yet unseen, from events of the recent past: the deregulation of the energy markets, the collapse of Enron and most certainly the attacks of Sept. 11, 2001. The beginning of this new era will be characterized by financial market uncertainty, threats to the integrity of energy supply sites and infrastructure, heightened awareness for safety and security measures, a renewed recognition of the importance of contingency planning and the need for regional cooperation between governments. The improvements in energy conservation will save money for governments, businesses and households, preserve precious nonrenewable resources, and restore air and water quality - in general, improving the standard of living as we know it.

The potential for reducing energy usage in the District is promising (the compounding effect of small but steady reductions over time in, for example, motor gasoline, can be seen in Figure II-13); however, population increases after 2000 could offset recent progress. To maintain the downward trend in the residential, transportation, industrial sectors, to curtail the growth in the commercial sector, and to find alternative methods for meeting anticipated demand, a number of recommendations are presented in Chapter IV.

Estimated Savings in Motor Gasoline Per Projected Level of Reduced Consumption



Base Year is Average of 1990 to 1999 DC Motor Gasoline Consumption = 20.58 TBtu
 EIA, State Energy Data Report, 1999, Average Determined from Table 69.

Figure II-13

CHAPTER VI

THE DC ENERGY OFFICE OF THE FUTURE

Introduction

As the energy office for the District of Columbia, DCEO strives toward permanent energy efficiency for those who work, live and play in the District and short-term energy assistance to the economically vulnerable. This chapter focuses on how the DCEO of the future will be implementing the CEP III and carry out its other functions. It highlights DCEO's:

- E-government initiatives that are important for reducing the cost and improving the quality of DCEO's service delivery;
- Outcomes-based planning as it relates to CEP III;
- Processes and information systems necessary for the office to provide ongoing monitoring of the progress of CEP III and conducting evaluation of the programs that respond to the Plan's recommendations;
- Need for a balanced funding approach to support the office's efforts in helping the city achieve energy efficiency and to continue to its leadership role in energy policy and planning in the District.

DCEO's E-Government Initiatives

DCEO recognizes national, state and local governments' movement toward e-government. E-government is the use of the Internet and related information technologies to improve decision-making, transform internal business operation and improve the delivery of customer service. One way to enhance the value of government to its residents, citizens, clients and customers is to use technology to expand services at the same time costs are reduced, thus achieving dramatic improvements in mission effectiveness and operational efficiency. These e-government initiatives include:

1. Improving energy decision-making;
2. Improving the delivery of energy services to DCEO's clients.

Improving Energy Decision-Making

GS-2 highlights the importance of getting real time data in improving energy use decisions. TS-5 calls for the expanded use of timely information in the Transportation Sector to help motorists and commuters reduce congestion and thereby their consumption of motor fuels.

Improving the Delivery of Services to DCEO's Clients

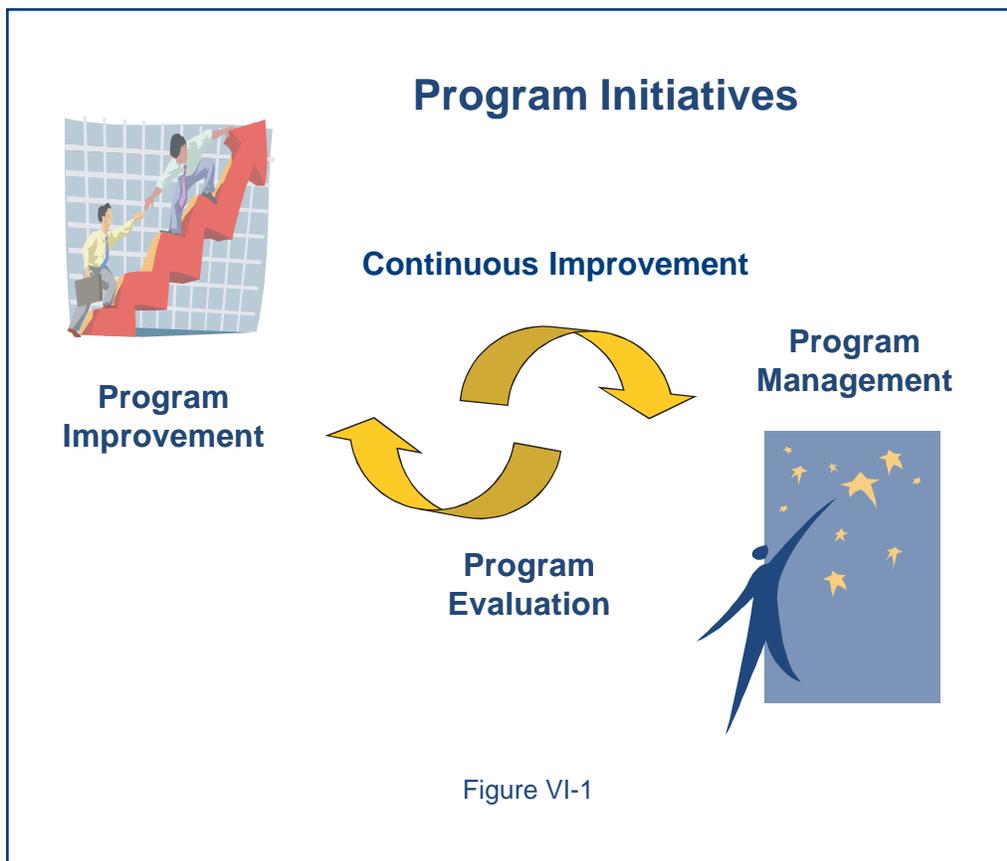
EA-5 promotes the uses of wireless technology to enhance the LIHEAP intake process. EA-6 calls for the electronic processing of LIHEAP benefits. EA-7 recommends that the Capital Access Electronic Benefits Transfer capability be designed and implemented for LIHEAP's heat-included-in-rent customers. PI-

3 calls for an enhanced DCEO website and PI-2 calls for an expanded Energy Hotline. These focus on the various e-service delivery channels that DCEO operates.

Performance-Based Planning

In this Age of Accountability, the CEP III can be an active guide that leads to improved energy policy, planning and evaluation for DCEO, as illustrated in Figure VI-1. Following the recommendations of the CEP III, DCEO will move toward:

1. Improving its planning and policy capacity;
2. Developing outcome-based performance measures and managing based on results;
3. Developing information systems to monitor the progress toward achieving the goals of the CEP III.



Improving Planning and Policy Capacity

GS-1 calls for mandating an energy management plan for each District agency. EP-1 and EP-2 focus on improving emergency planning and response. The other sectors - Residential, Commercial/Industrial, Institutional

and Transportation - all require improved data collection, better data analysis, and ways to use that data for ongoing evaluation. An enhanced data collection and planning process will strengthen the ability of all sectors to work together to achieve the energy goals of the city. The use of the DC Atlas, the District's geographical information system, will allow tracking and statistical reporting of such parameters as the distribution of its clients participating in utility discount and weatherization programs, the targeting of demonstration programs, and a variety of affairs related to energy emergency planning.

Developing Outcome-Based Performance Measures and Managing Based on Results

A successful CEP III will require the tracking of progress on the achievement of its goals, objectives and strategies over time so that we know where we are going in relation to our ultimate goals and objectives by measuring where we are in the attainment of interim outcomes. For example, working with the PSC, OPC, utilities, and private sector energy contractors, DCEO with proper funding and other support could develop an Energy Efficiency Scorecard for the District of Columbia (EES-DC). That scorecard would include such items as overall measures of energy efficiency of the end-use sectors, energy efficiency targets, how demand is being met through production and conservation, rate of installation of energy efficient appliances and systems, estimated energy savings and benefits-costs of adopting innovative energy systems, and the diffusion of energy efficiency benefits among low-income households. The EES could also assist in the development of future CEPs by helping to determine what worked and what didn't, and the cost-effectiveness of the recommendations implemented. It is critical that such evaluation efforts be put in place at the outset to ensure that meaningful data can be gathered and analyzed, thereby enabling managers and decision-makers to determine the effectiveness of the recommendations undertaken.

Developing Information Systems to Monitor CEP III Performance

Given the emphasis on outcomes, DCEO information systems should be appropriately adjusted to collect, maintain and analyze data related to key CEP III goals, objectives and strategies. This information system can be essential to annual CEP III review, to appropriate adjustment or modification of CEP III goals and objectives, and for communication with the District's federal, state, regional, business, neighborhood and research partners. For each key CEP III goal or objective, outcome measures should be proposed to both assess progress and to coordinate the movement toward overall attainment of CEP III major goals. Information technology can assist in this endeavor if DCEO continues to adopt an enterprise-wide approach by engineering the process to take advantage of the DC Wide Area Network, SOAR and the Geographic Information System capabilities of the DC Atlas, thus increasing productivity and improving delivery of services.

DCEO's Funding Requirements for CEP III Performance

To realize the promise of CEP III, an additional funding model needs to be explored. This is illustrated graphically in Figure VI-2. As several of the recommendations have highlighted, the absence of DC-appropriated funds for DCEO hinders the office's ability to fulfill its mandate under the law. GS-3 calls for the promotion of cost sharing to promote DC agency energy conservation. EA-4 supports use of RETF funds to expand the number of LIHEAP clients that could be served.

FUNDING NEW ENERGY DIRECTIONS

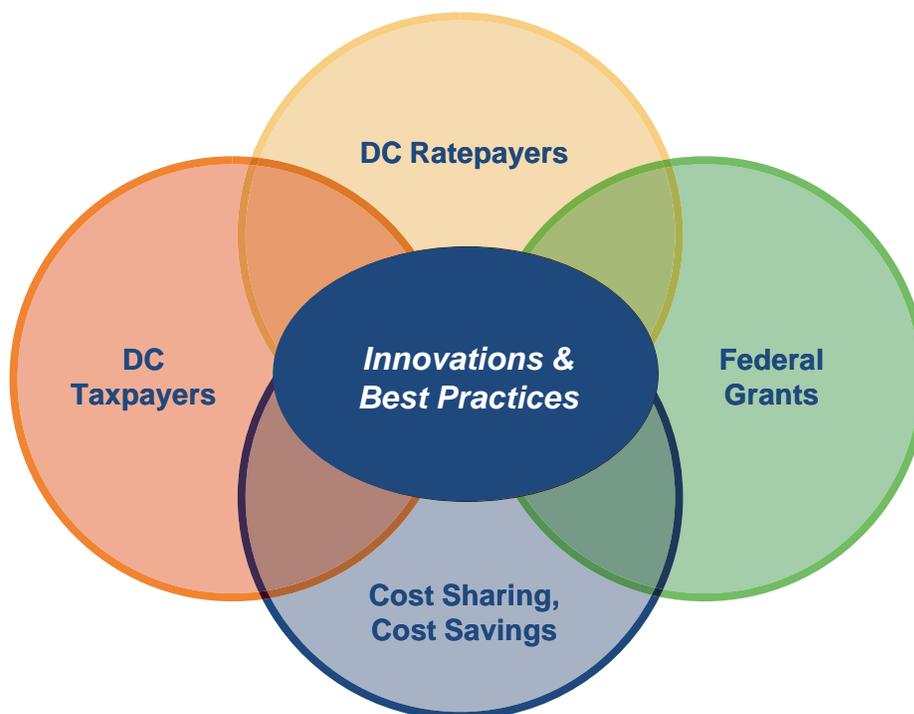


Figure VI-2

While DCEO has an important mission and a broad array of program responsibilities, one of the key limiting factors to the office fulfilling its mission is that many of its activities need to be funded. Although DCEO prides itself on being an entrepreneurial organization, more than a few of the planning initiatives in CEP III require new or additional funding if those initiatives are going to produce the desired results. Table VI-1 presents DCEO's various funding sources for FY 2002.

Fiscal Year 2002 DC Energy Office Budget by Funding Source		
Funding Source	Budget	Percent
Local funds (District appropriations)	\$199,183	1.52%
Federal grants	9,018,947	68.40%
Private grants	15,686	0.12%
Intra-District funds (TANF, EMA)	2,565,000	19.45%
Other funds (RETF, UDP, PVE)	1,386,268	10.51%
Total	\$13,185,084	100.00%

Table VI-1

As Figure VI-2 shows, there are several key sources of funding that could lead to an effective energy strategy for the city. However, currently, the absence of DC-appropriated funds to DCEO limits the office's ability to plan, implement and assess its programs and to fulfill its role of guiding the energy future of the city. As part of a new funding model, financial resources should be made available for collecting data, for monitoring progress toward meeting citywide energy goals, and for evaluating programs. In particular, with the importance of deregulation and the new regulatory environment, DCEO, as the state energy office of the District of Columbia, should be funded in such a way that it can make effective contributions to shaping that new environment on behalf of taxpayers and ratepayers. The Mayor and DC Council should recognize the importance of providing DCEO a minimum amount of funding via appropriated funds for its core missions so that it can guide the strategic direction of energy use in the District. A case in point: DCEO was given oversight of the DC Municipal Aggregation Program by the Executive Office of the Mayor; however, no appropriated dollars accompanied this responsibility to offset any expenditures DCEO had to incur in an effort to make the DC MAP a reality.

Conclusion

With the guidance of the CEP III's 43 recommendations, the focus of the three themes and nine sub-themes, the use of e-government to improve energy decision-making and service delivery, the adoption of performance-based planning, and the implementation of an appropriate funding model, DCEO will be able to enhance its role in shaping an evolving energy policy, legal and regulatory framework that will continue to make DC an energy efficient city for the next five years and beyond.

GLOSSARY

A

Active Solar Heating Systems: A solar water or space-heating system that use pumps or fans to circulate the heat-transfer fluid from the solar collectors to a storage tank subsystem.

Aggregators: An organization that groups customers into a group to purchase natural gas or electricity services with the intention of achieving volume discounts.

Alternative Fuels: A term for "non-conventional" transportation fuels derived from natural gas (propane, compressed natural gas, methanol, etc.) or biomass materials (ethanol, methanol).

ASHRAE: Abbreviation for the American Society of Heating, Refrigeration, and Air-Conditioning Engineers.

B

Barrel (Petroleum): A unit of volume equal to 42 U.S. gallons.

Bi-Fuel Vehicle: A vehicle with two separate fuel systems, one for gasoline or diesel, and other for either natural gas or propane. The vehicle can easily switch between the two fuels.

Bikeway: Any road, street, or path that is designated to accommodate bicycle travel. Bikeways do not have to be separated facilities and may be shared with other travel modes.

Blower Door: A device used by energy auditors to pressurize a building to locate places of air leakage and energy loss.

British Thermal Unit (Btu): The quantity of heat needed to raise the temperature of 1 pound of water by 1 degree Fahrenheit at or near 39.2 degrees Fahrenheit.

Building Envelope: The structural elements (walls, roof, floor, foundation) of a building that encloses conditioned space; the building shell.

C

Capacity: An amount of electricity that would be available from a generating unit, utility or system. Capacity is valued in units of energy such as megawatts for electrical power or cubic feet for natural gas.

Carbon Monoxide: A colorless, odorless but poisonous combustible gas with the formula CO. Carbon monoxide is produced in the incomplete combustion of carbon and carbon compounds such as fossil fuels (i.e. coal, petroleum) and their products (e.g. liquefied petroleum gas, gasoline), and biomass.

Clean Air Act: Federal regulations that detail acceptable levels of airborne pollution and spell out the role of state and local governments in maintaining clean air.

Climate Change: A term used to describe short- and long-term affects on the Earth's climate as a result of human activities such as fossil fuel combustion and vegetation clearing and burning.

Congestion Mitigation and Air Quality (CMAQ) Program: A special provision of the Intermodal Surface Transportation Efficiency Act (ISTEA) that directs funds toward projects in Clean Air Act Non-Attainment areas for ozone and carbon monoxide.

Cogeneration: A source that generates electricity and also provides steam or other energy for industrial or commercial uses; also known as Combined Heat and Power (CHP).

Compact Fluorescent Lighting (CFL): An efficient form of lighting; CFL bulbs use one-quarter to one-third as much electricity to give the same light output as a standard incandescent bulb while creating much less heat, and last up to 10 times as long as a standard incandescent light (10,000 vs. 1,000 hours).

Compressed Natural Gas (CNG): Natural gas (methane) that has been compressed to a higher-pressure gaseous state by a compressor; used in CNG vehicles.

Conventional Fuel: The fossil fuels: coal, oil and natural gas.

Conservation: To reduce or avoid the consumption of a resource or commodity.

Customer Choice: Customer Choice is one of the terms, another being retail choice, to describe a competitive market where energy consumers are given a choice of energy supplier.

D

Daylighting: The use of direct, diffuse or reflected sunlight to provide supplemental lighting for building interiors.

Demand (or Load): The instantaneous energy use, either of a single customer or system wide.

Demand-Side Management (DSM): The process of managing the consumption of energy, generally to optimize available and planned generation resources.

Deregulation: The process of changing regulatory policies and laws to increase competition among suppliers of commodities and service. The process of deregulating the electric power industry was initiated by the Energy Policy Act of 1992. (See also Restructuring)

Distillate Fuel Oil: A general classification for one of the petroleum products produced in conventional distillation operations. It is used primarily for space heating, diesel engine fuel and electric power generation. Included are products known as No. 1, No. 2 and No. 4 fuel oils; No. 1, No. 2 and No. 4 diesel fuels.

Distributed Generation: A term for localized or on-site power generation.

Domestic Hot Water: Water heated for residential washing, bathing, etc.

Dual-Fuel Vehicle: A vehicle with an engine capable of operating on natural gas and diesel fuel simultaneously. Usually used on heavy-duty vehicles to achieve emission reductions and economy while retaining the power of a diesel, they operate primarily on natural gas with diesel fuel acting as the ignition source.

E

E-85: A mixture consisting of 85% ethanol and 15% gasoline, specially designed for use in flex-fuel vehicles. Ethanol is produced through the fermentation of starch, such as in corn or biomass, and is a renewable energy resource, with potentially 100% of its feedstock coming from sources within the United States.

Electric Vehicle (EV): A vehicle powered by electricity, usually provided by batteries but may also be provided by photovoltaic (solar) cells or a fuel cell.

End Use: The purpose for which useful energy or work is consumed.

Energy: The capability of doing work; different forms of energy can be converted to other forms, but the total amount of energy remains the same.

Energy Audit: The process of determining energy consumption, by various techniques, of a building or facility.

Energy Efficient Mortgage: A type of home mortgage that takes into account the energy savings of a home that has cost-effective energy saving improvements that will reduce energy costs. A borrower can qualify for a larger loan amount than otherwise would be possible.

Energy Efficiency: A reduction in energy usage for a given level of service or an increase in service for a given level of energy input.

Energy/Fuel Security: A policy that considers the risk of dependence on fuel sources located in remote and unstable regions of the world and the benefits of domestic and diverse fuel sources.

Energy Policy Act of 1992 (EPAct): A comprehensive legislative package that mandates and encourages energy efficiency standards, alternative fuel use, and the development of renewable energy technologies. Public Law 102-486 also authorized the Federal Energy Regulatory Commission (FERC) to order the owners of electric power transmission lines to transmit or "wheel" power for power generators including electric utilities, federal power marketing authorities, and exempt wholesale generators.

Energy Service Company (ESCO): A company that specializes in undertaking energy efficiency measures under a contractual arrangement whereby the ESCO shares the value of energy savings with their customer.

Energy Star: Energy Star is a set of voluntary energy efficiency programs, sponsored by the U.S. Environmental Protection Agency and the U.S. Department of Energy. Energy Star sets standards for, and labels, energy efficient products and sets standards of energy efficiency for homes and businesses.

Externality: The environmental, social and economic impacts of producing a good or service that are not directly reflected in the market price of the good or service.

F

Federal Energy Management Program (FEMP): A program of the U.S. Department of Energy (DOE) that implements energy legislation and presidential directives. FEMP provides project financing, technical guidance and assistance, coordination and reporting, and new initiatives for the federal government. It also helps federal agencies identify the best technologies and technology demonstrations for their use.

Federal Energy Regulatory Commission (FERC): An independent regulatory agency that has jurisdiction over interstate electricity sales, wholesale electric rates, natural gas pricing, oil pipeline rates, and gas pipeline certification.

Flex-Fuel Vehicle - A vehicle with an engine capable of operating on gasoline and an alcohol fuel (either ethanol or methanol). The vehicle has one tank and can accept any mixture of gasoline and the alternative fuel.

Fossil Fuels: Fossil fuels such as coal, petroleum and natural gas are derived from plants and animals buried for so long and under such heat and pressure that they became minerals. The energy from fossil fuels comes from the high energy bonds formed between one carbon atom and another, as well as those formed between carbon and hydrogen atoms. These fuels are limited in total quantity and are non-renewable.

Fuel Cell: An electrochemical device with no moving parts that converts the chemical energy of a fuel, such as hydrogen, and an oxidant, such as oxygen, directly into electricity.

Fuel Oil: Any liquid petroleum product burned for the generation of heat in a furnace or firebox, or for the generation of power in an engine. Domestic (residential) heating fuels are classified as Nos. 1, 2 & 3; industrial fuels as Nos. 4, 5 & 6.

G

Gasohol: A blend of finished motor gasoline (leaded or unleaded) and alcohol (generally ethanol but sometimes methanol) in which 10% or more of the product is alcohol.

Gigawatt (GW): A unit of power equal to 1 billion watts; 1 million kilowatts, or 1,000 megawatts.

Global Warming: A term used to describe the increase in average global temperatures due to the greenhouse effect.

Green Power: Green Power is a term used to describe electricity produced by sources that are less harmful to the environment than fossil fuels. While there is no strict definition of Green Power, generally renewable sources such as solar, wind power, geothermal, biomass, and small hydroelectric are considered Green Power sources.

Greenhouse Effect: A term used to describe the heating effect due to the trapping of long wave (length) radiation by greenhouse gases produced from natural and human sources.

Grid: A common term referring to an electricity transmission and distribution system.

H

High Occupancy Vehicle (HOV): Vehicles having more than one occupant, such as carpools, vanpools, buses and mini-buses. Transportation systems may encourage HOV use by having designated HOV lanes.

Home Energy Rating Systems (HERS): A nationally recognized energy rating program that gives builders, mortgage lenders, secondary lending markets, homeowners, sellers and buyers a precise evaluation of the energy quality of a home.

I

Integrated Resource Plan (IRP): A plan developed by a utility that defines the short- and long-term capacity additions (supply side) and demand side management programs it will undertake to meet projected energy demands.

Intelligent Transportation Systems (ITS): Electronic, computer and communications technology applied to surface transportation to increase safety, reduce congestion, enhance mobility, minimize environmental impact, increase energy efficiency and promote economic productivity.

Intermodal Transportation: Transportation of persons and goods that involves the interchange between transportation modes such as surface routes, airways and waterways. Intermodal transportation for surface movement of people and goods includes the interconnection between automobiles and mass transit such as buses and commuter rail, and can include Park and Ride lots or other mode interchange facilities.

Interruptible Load - Energy loads that can be shut off or disconnected at the supplier's discretion or as determined by a contractual agreement between the supplier and the customer.

K

Kilowatt (kw): One thousand watts, where a watt is a unit of electrical power calculated as the rate of energy transfer equivalent to one ampere flowing under a pressure of one volt.

Kilowatt-hour (kwh): The standard measure of electricity usage measured as one kilowatt of power supplied to, or taken from, an electric circuit steadily for one hour.

L

LEED: Leadership in Energy and Environmental Design, a program of the U.S. Green Building Council that promotes buildings that are environmentally responsible, profitable and healthy places to live and work. The LEED rating system supports the adoption of sustainable design and building practices.

Life Cycle Cost: The sum of all the costs both recurring and nonrecurring, related to a product, structure, system or service during its life span or specified time period.

Light Rail: A railway with a "light volume" traffic capacity compared to "heavy rail." It uses lightweight, streetcar type passenger vehicles operated on city streets not separated from other traffic for much of the way.

Load: The demand on an energy producing system; the energy consumption or requirement of a piece or group of equipment.

Load Management: Activities designed to influence the demand (timing and amount) on a power source.

M

MCF: An abbreviation for 1,000 cubic feet of natural gas with a heat content of 1,000,000 Btu, or 10 therms.

Megawatt (MW): One thousand kilowatts, or 1 million watts; standard measure of electric power plant generating capacity.

Municipal Solid Waste (MSW): Waste material from households and businesses in a community that is not regulated as hazardous.

N

Natural Gas: A hydrocarbon gas obtained from underground sources, often in association with petroleum and coal deposits. It generally contains a high percentage of methane, varying amounts of ethane, and inert gases; used as a heating fuel.

Net Metering: The practice of using a single meter to measure consumption and generation of electricity by a small generation facility (such as a house with a wind or solar photovoltaic system). The net energy produced or consumed is purchased from or sold to the generator, respectively, at the same price.

Nominal Dollars: Dollars not adjusted for inflation.

Non-Attainment Areas: These are geographical areas, defined by the U.S. Environmental Protection Agency, whose air quality does not meet federal air quality standards designed to protect public health.

Nonrenewable Fuels: Fuels that cannot be easily made or "renewed," such as oil, natural gas and coal.

Non-Utility Supplier: A company other than a utility that provides natural gas or electricity. Also referred to as independent power producer.

O

Ozone: A major component of smog. While ozone in the upper atmosphere is beneficial to life by shielding the earth from harmful radiation, high concentrations of ozone at ground level are a significant health concern. Ozone is formed through a complex reaction of chemicals released in the air primarily from the use of fuels in industry and transportation.

Ozone Layer: A concentration of ozone molecules in the stratosphere. Stratospheric ozone is a naturally occurring gas that filters the sun's ultraviolet (UV) radiation. A diminished ozone layer allows more radiation to reach the Earth's surface, and can lead to skin cancer, cataracts, weakened immune systems, reduced crop yield and disruptions in the marine food chain. It is caused by the release of chlorofluorocarbons (CFCs) and other ozone-depleting substances that were used widely as refrigerants, insulating foams and solvents.

P

Particulates: The fine liquid or solid particles contained in combustion gases. The quantity and size of particulates emitted by cars, power and industrial plants, wood stoves, etc are regulated by the U.S. Environmental Protection Agency.

Passive Solar (Building) Design: A building design that uses structural elements of a building to heat and cool a building, without the use of mechanical equipment, which requires careful consideration of the local climate and solar energy resource, building orientation and landscape features, to name a few.

Passive Solar Heater: A solar water or space-heating system in which solar energy is collected and/or moved by natural convection without using pumps or fans.

Payback: The amount of time required for positive cash flows to equal the total investment costs.

Petroleum: A generic term applied to oil and oil products in all forms, such as crude oil, lease condensate, unfinished oils, refined petroleum products, natural gas plant liquids and non-hydrocarbon compounds blended into finished petroleum products.

Photovoltaic Device: A solid-state electrical device that converts light directly into direct current electricity of voltage-current characteristics that are a function of the light source and the materials and design of the device.

Power: Energy that is capable or available for doing work; the time rate at which work is performed, measured in horsepower, watts, or Btu per hour. Electric power is the product of electric current and electromotive force.

Power Grid: The network of transmission lines that link all generating plants in a region with local distribution networks to help maximize service reliability.

Public Utilities Regulatory Policy Act (PURPA): A 1978 federal law that requires utilities to buy power from eligible cogeneration sources, small hydro or waste-fueled facilities, under contracts at an avoided cost rate. The utilities also must provide a backup supply of electricity to customers who choose self-generation.

Q

Quad: One quadrillion Btu (1,000,000,000,000,000 Btu)

R

RETF: Reliable Energy Trust Fund, a public benefit fund developed through the electric utility restructuring process to assure continued support for low-income programs, energy efficiency initiatives and renewable energy resources, supported through a surcharge to all customers.

Renewable Energy: An energy source for generating electricity that is not based on fuels with limited reserves. Included are solar power, hydropower, wind power, geothermal power, and tidal power.

Residual Fuel Oil: The topped crude of refinery operations that includes No. 5 and No. 6 fuel. Residual fuel oil is used for the production of electric power, space heating, vessel bunkering and various industrial purposes.

Resource Recovery: The process of converting municipal solid waste to energy and/or recovering materials for recycling.

Restructuring: The process of changing the structure of the electric power industry from one of guaranteed monopoly over service territories, as established by the Public Utility Holding Company Act of 1935, to one of open competition between power suppliers for customers in any area.

Retail Competition: A market that allows more than one energy provider to sell directly to customers, and where customers have the choice of buying from more than one provider.

S

Savings-to-Investment Ratio (SIR): The total savings of an energy conservation measure divided by its installation cost. The SIR indicates how many times the measure will repay the initial investment over its lifetime.

Solar Collector: A device used to collect, absorb and transfer solar energy to a working fluid.

Solar Thermal Systems: Solar energy systems that collect or absorb solar energy for useful purposes. Can be used to generate high temperature heat (for electricity production and/or process heat), medium temperature heat (for process and space/water heating and electricity generation), and low temperature heat (for water and space heating and cooling).

Supply Side: Technologies that pertain to the generation of electricity.

T

Therm: The standard unit for measuring the amount of gas used, defined as the volume of gas needed to generate 100,000 Btu.

Types of Utility Service: FIRM -- The delivery of electricity or gas to a customer on a continuous basis. Residential and smaller commercial customers generally use this service. INTERRUPTIBLE -- The delivery of electricity or gas to a customer that may be interrupted by the utility generally because of system supply or capacity limitations. OFF-PEAK OR SEASONAL -- The delivery of gas, firm or interruptible, sold only during certain times of the year, generally when there are not high system demands.

W

Weatherization: Caulking and weatherstripping to reduce air infiltration and exfiltration into/out of a building, as well as other measures to increase the building's energy efficiency.

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DC Energy Office

Chuck Clinton, Director
Michael Clark, Chief, Conservation Programs
Ralph McMillan, Chief, Regulatory Affairs
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Sharon Cooke, Chief, Education Programs
Carl Williams, Manager, Residential Program
Howard Ebenstein, Project Leader
Tomaysa Sterling, Project Co-Leader
Ron Crittendon, Graphic Design

Consultants

Pedro Alfonso, Dynamic Concepts Inc.
Lenneal Henderson, University of Baltimore
Donald Milsten, State Service Program
Jerome Paige, Jerome S. Paige & Associates

Reviewers

Larry Barrett, Barrett Consulting Associates Inc.
Elizabeth Berry, Executive Office of the Mayor
Phylicia Fautleroy Bowman, DC Public Service Commission
Alan Burks, Enterprise for Education
Tim Dimond, DC Office Property Management
Ron Flowers, DC Department of Public Works
James Gallagher, Washington Metropolitan Area Transit Authority
Darryl Gorman, DC Office of the Corporation Counsel
Chuck Guinn, Strategic Guidance Associates
Leslie Hotaling, DC Department of Public Works
Jimmy Jiminez, DC Office of Property Management
Theresa Howe Jones, United Planning Organization
John Koskinen, DC City Administrator
Ken Laden, District Department of Transportation
Curt Nichols, City of Portland, Oregon
Elizabeth Noël, DC Office of the People's Counsel
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***DISTRICT OF COLUMBIA
ENERGY OFFICE***

**1400 14th Street NW
Suite 300 East
Washington, DC 20009
(202) 673-6750 Hotline
(202) 673-6725 Fax
www.energy.dc.gov**



**GOVERNMENT OF THE
DISTRICT OF COLUMBIA
Anthony A. Williams, Mayor**