2002 Annual Report
Conservation Advisory Commission
City of Newark, Delaware

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Overview

This report summarizes the activities of the City of Newark's Conservation Advisory Commission (CAC) during the 2002 calendar year. Some of these overlap with 2001 activities as described that year's report, and some materials are repeated to provide a "stand-alone" document. The direction of anticipated CAC work in 2003 is also described.

Background

The CAC was created in November, 1977 by Ordinance 77-56,

> "to advise in the development, management, and protection of its natural resources with appropriate consideration of Newark's human and economic resources. The Commission shall concern itself with conservation in its broadest sense and may, among its activities:
> (a) Recommend to City Council a program for ecologically suitable utilization of all wet lands, valley streams, and flood plains and other land areas, the condition and use of which will affect the environmental quality of life in the City of Newark;
> (b) Shall file an annual report;
> (c) Maintain informal liaison with the Planning Commission, the Parks and Recreation Department, the City Manager, and the City Council, and cooperate with other public and private bodies organized for similar purposes:
> (d) In addition to the foregoing, carry out any other duties, tasks, or responsibilities, consistent with the objectives of this Commission assigned to it by resolution of City Council."

Ordinance 77-56 gave examples of programs that may be considered by the Commission, such as street tree replacement; improved recycling; beautification plans for volunteer groups; guidelines for multiple use of open space and public areas; community gardens; energy conservation; and review of Zoning Code amendments to encourage conservation, and also stated that "the above list shall not, however, limit the program which the Commission may undertake or be requested to undertake."

CAC Membership

The CAC has 9 members when all positions are filled, but due to the time delays required in filling vacated positions, it functioned with fewer members during portions of 2002. The term of Mr. Alan Hitchner expired in 2001 and he asked to not be reappointed; Ms. Jane Dilley was appointed to this position in April 2002. Mr. Art O'Neill resigned in 2001 and this position was filled by Mr. Doug Janiec in June 2002. Mr. Peter Griffin resigned in February 2002 and his position was filled by Mr. Kevin Vonck in April 2002.

The CAC roster during 2002 is provided as **Appendix A.**

The CAC's year 2002 activities are organized in this report into three groups:
-activities in response to City Council Requests
-activities initiated by the CAC
-activities conducted on a regular basis

2002 CAC Activities in Response to City Council Requests

Solar Power: At its January 14, 2002 meeting, City Council discussed the possibility of solar power systems and their possible use by the City. Three specific questions were presented:

1) What state and/or federal grants were available to municipal governments to pursue solar power projects;
2) Seek out assistance from those who know how to operate solar systems, i.e., University of Delaware and Astro Power; and
3) Complete a rough estimate of cost versus benefit.

Council unanimously passed the following resolution:

MOTION BY MR. KALBACHER SECONDED BY MR. OSBORNE: THAT THE CONSERVATION ADVISORY COMMISSION LOOK INTO THE QUESTIONS AS OUTLINED BY MR. KALBACHER REGARDING SOLAR POWER PROJECTS AND REPORT THEIR FINDINGS TO COUNCIL.

The CAC was able to respond to all of these questions. Inquiries were made of the State of Delaware, the University of Delaware, and Astropower, as well as other information sources. The CAC findings were as follow:
1) The State of Delaware has a Renewable Energy Rebate Program offering a 35% subsidy for the capital costs of solar power installations, equaling approx. $3/Watt, with a $10,500 ca However, the fund is accrued through a surcharge on customers of Conectiv Power Delivery and the Delaware Electric Cooperative, and is thus available to these customers only. Customers of the nine municipal electric utilities in Delaware (Clayton, Dover, Lewes, Middletown, Milford, Newark, New Castle, Seaford, and Smyrna), and those municipalities themselves, are NOT eligible.

The U.S. Department of Energy offers a Renewable Energy Production Incentive (REPI) for electric production facilities owned by state and local government entities (such as municipal utilities) that start operations before September 30, 2003. Annual incentive payments are 1.5 cents per kilowatt-hour, subject to the availability of annual appropriations in each Federal fiscal year of operation. Qualifying technologies include solar, wind, and biomass (except for municipal solid waste combustion).

2) Pricing was received from AstroPower at approximately $10/watt of installed solar power generation capacity as photovoltaic (PV) cells. The CAC used this as the basic cost in its cost estimations. Confirmation of cost estimates was obtained from Dr. John Byrne, Director of the University of Delaware's Center for Energy and Environmental Policy.

3) The CAC examined the economics of PV installation on the roof of the new city warehouse, with an area of about 6,000 square feet. The cost of this would be approximately $900,000. At the prevailing cost of fossil fuel electricity (about 8.5¢ per kW-h), this would generate about $14,000 of electricity per year, which is prohibitively expensive. Even if the REPI subsidy were obtained, and a 2¢ per kW-h premium charged to customers, the CAC calculations showed that the 12¢ per kW-h total price would still require the PV facilities to operate for 50 years to pay back the initial investment. The is well beyond the typical lifetime of current PV installations.

In order to obtain a payback period of 30 years (a possible, but long, PV lifetime), it was calculated that the necessary charge for solar electricity would be 27.5¢ per kW-h. This is over three times the rate for fossil fuel electric (see Appendix A, Table 1-1).

The CAC determined that these costs were not likely to be acceptable. Two alternatives were given further consideration:

1. Install a smaller solar facility. A 5 kW installation would cost around $50,000 and would generate $765 of electricity (average) per year. The payback period would still be very long, but the investment would be considerably smaller as a demonstration project.

2. Allow customers to purchase a percentage of their electric power as solar energy on an elective basis. A customer paying an average of $67 per month on their electric bill could purchase 25% of their electricity as solar power and pay approximately $102 per month.

These possibilities were presented to Council as part of a larger proposal for Green Energy, covered in the following section of this report.

2002 CAC Activities Initiated by CAC

Green Energy: As a follow-up on the inquiry into solar power, a broader study was made into possibilities for using other sources of non-fossil fuel for Newark's electricity. It was found wind power could be obtained as a much less expensive alternative to solar power: a customer paying an average of $67 per month for fossil-fuel-based electricity could be supplied with 100% wind-generated electricity with a monthly billing of about $80, or 25% wind electricity for $70.

Another non-fossil fuel that could serve as an energy source is the waste gas from Delaware's landfills. It was found that the Delaware Solid Waste Authority has actively been pursuing the modification of two downstate landfills to enable the gas to be burned in order to generate electricity. The cost of this electricity is expected to be only slightly higher than that of wind-generated electrical power. The combustion produces carbon dioxide which is a greenhouse gas, but destroys methane, a much more potent greenhouse gas, and much of the gas is being flared off at present in any case.

The CAC gave considerable study to these possibilities and submitted a detailed proposal to City Council in November 2002. This proposal is appended to the Annual Report as Appendix B. The proposal included information on the considerable environmental impact of fossil fuel usage, even from a city the size of Newark, and proposed that Newark electrical customers could choose from solar, wind, or landfill energy sources as alternatives to fossil fuel electricity, and each of the alternatives would include an appropriate premium added to the electrical bill. The City would then contract for electrical purchases from the corresponding sources at the necessary amounts. The program would require a publicity and education effort to attain a reasonable level of participation and make the elective program worth the City's effort.

Public Workshop on the Conservation Advisory Commission: In late 2001 City Council voted to consider deleting reference to the CAC from the City code, thereby abolishing the CAC. When the proposal had its second reading, people supporting the CAC filled Council chambers to standing room only and crowded around the doorway outside in the hall. Considering the

desire of these CAC supporters to express their opinions on CAC issues, several people suggested having a workshop to give the public such an opportunity.

The CAC acted on this suggestion and with the help of City staff, organized an open public meeting on April 30, 2002. The purpose of the workshop was to review recent CAC issues and receive public input on CAC priorities. Over twenty people attended the workshop in addition to CAC members, the Mayor, several council members and several City staff. CAC members spoke on past and present issues including, recycling, riparian corridors, solar energy and other alternative energy sources (Green Power), Adopt-A-Park/Stream program, littering, rubberized asphalt, road salt alternatives, energy conservation, review of Planning Department applications, Newark Clean-up and Newark Community Day.

City staff prepared minutes of the workshop, which were reviewed along with CAC notes at the next CAC meeting. Recycling issues were by far the most popular topic and the CAC discussed that with their mission they should be supportive of recycling in their advisory role to Council. Several people expressed the need for a revision of the City's 15 year old Comprehensive Development Plan. CAC members reviewed the existing plan within the following months and by the end of 2002 the City had developed a revised Newark Comprehensive Development Plan II, as well as preparing an Newark Adjacent Areas Land Use Plan II that were reviewed and approved by Council. Doug Janiec suggested that the CAC work towards creating a natural resources data base for use by the City staff. Mr. Janiec later was later appointed as a CAC member and has further developed the proposal for action by the CAC.

Green power alternative energy sources were brought up at the workshop and have been discussed at length by the CAC. Following a request by Council, the CAC has prepared a report on Green power (wind power, solar power, and use of landfill gases) late in 2002. The need for the CAC to continue to support public awareness of water conservation was discussed, particularly during the construction period of the new Newark water supply reservoir and even after reservoir completion.

Many other issues were mentioned during the meeting including: additional parkland of the Morris tract State Park and City Koelig reservoir, need for designation of a portion of West Main Street as a historic district, review of City Code for improvement or consistency with the New Castle County Code, and availability of household hazardous waste collection. Recycling bins have now been made available at both Newark Nite and Newark Community Day, as suggested at the workshop.

Recycling: Recycling has been the most common topic of the CAC in recent years, as brought up by CAC members and public comment. Recycling was the most discussed topic of the April 2002 CAC Public Workshop. The CAC was influential in bringing about the City pilot program of curbside recycling in 1997, when Lee Smucker and others provided a considerable amount of time and effort in support of recycling. City staff have devoted a significant effort on recycling issues over the years, especially during the pilot program and maintaining containers for recycling during City events. In recent years Peter Drake has devoted time and effort researching recycling possibilities and attending local and state meetings on recycling, including the state's Strategy Committee on Recycling.

In 2001 the CAC with the assistance of both the City and the University of Delaware Center for

Energy and Environmental Policy - Department of Civil and Environmental Engineering, submitted a proposal to the DNREC Recycling Assistance Grant Program to review and study recycling in Newark. The City also submitted a proposal to the program. Neither proposal was funded in 2001. Neither the CAC nor the City made submissions to the program in 2002. Current guidelines for the program encourage proposals that would result in actual diversion of recyclable materials from conventional waste streams.

In summary, most CAC discussions on recycling come back to the same points. These include:

Public surveys support that in Delaware there is a strong need for public education on the values of recycling.

The public *willingness to pay* is a central requirement to establishing any recycling program.

In Newark the State Delaware Solid Waste Administration (DSWA) pays for the existing Igloo recycling sites. Newark Igloo locations are among the heaviest used in the State. In order for a City of Newark recycling program to succeed, it would need to surpass this level of waste flow diversion that is a State service.

In general, a City program would need to not cause a reduction in the existing trash collection service, as well as pay for itself through a balance of a reduction in disposal tipping fees and securing a cost return for recyclable materials. Newark trash collection now serves about 6,600 households (excluding apartments) for curbside pickup. There are 7 routes on Mondays and Tuesdays (resulting in 5 transfer truck trips to the regional landfill) and 6 routes on Thursdays and Fridays (2 trips to the landfill). Each curbside pickup truck is a 25 yard capacity side loader.

There is no Materials Recycling Facility (MRF) close to Newark to provide separation of material types for recycling. Therefore, separation would have to at the source (curbside) in Newark.

There is no real market for a cost recovery of paper, which is the dominant material of the curbside trash stream. There is variable marketability of other recycled materials (metals, glass, plastics).

Curbside recycling services are provided in other communities, where it is a statewide requirement or in areas where local/regional programs provide cost savings, through a reduction of disposal costs (landfill expansion needs, tipping fees, or transportation costs).

The CAC, as an advisory group to City Council, has limited resources in promoting a City of Newark Recycling program. State level support in a form beyond or in place of the existing Igloo program seems to be necessary. The CAC will continue to be receptive to opportunities where it can provide support to a City recycling effort, but currently has tabled discussion of recycling.

A side issue of automotive tire recycling was brought up at several CAC meetings in 2002, since tires are a perpetual material of annual volunteer stream cleanups. CAC and City staff investigations report that cradle to grave accounting of tires would be a solution beyond the volunteer tire disposal system now in place. However, repeated state level attempts to create such a system have failed. Neither the CAC nor the City are in a position to establish a stand alone tire

recycling or disposal program.

Adopt-A-Park/Stream: The CAC conducted a community stewardship program from 1991 to1993. A similar program was re-initiated in 2001 by the CAC allowing groups or organizations to take care of either City parks or stream sections. Street or block areas were dropped from the program in consideration of vehicular traffic volunteer safety. The program primarily encourages litter and trash clean up and provides plastic bags and gloves to participants.

During 2002 Cub Scout Pack 56 and Mount Aviat Academy entered the program and have conducted regular clean ups of Lumbrook Park and George Read Park, respectively. The Newark High School Nature Club has expressed interest in adopting the Christina Creek from Elkton Road to Arbour Park and Phi Mu Alpha Fraternity has considered adopting Dickey Park, but neither have entered the program to date.

A description of the program was included in an issue of the City of Newark Newsletter and Kurt Philipp made presentation to the Boys Scouts of America District Council meeting in September.

Riparian Corridors: The CAC spent considerable time on this area in the first half of 2002 due to concerns about erosion and flooding problems in the Christina Creek. Lack of proper attention to the riparian corridor along this creek, particularly in the Christianstead and West Branch developments, was believed to be an important contribution to these problems. The residential developments of Christianstead and West Branch included deed restrictions, put in place in 1985, intended to protect the 100-year flood plain areas included in these residential properties. In many cases, these restriction had not been heeded, impairing access to the trail along the stream and razing natural vegetation.

In early 2002, the CAC obtained further information from the City regarding attempted enforcement. The CAC in its January meeting reviewed at length the success of efforts to date by the City and volunteer conservation organizations to educate and encourage the creek side home owners to manage their property as mandated in their deeds. With one-third to two-fifths of the citizens still in non-compliance, the CAC between the January and March meetings drafted, edited, and passed a Memorandum to the Mayor and Council urging its taking an aggressive role in enforcing the home owners' deed restrictions that require preservation of the riparian corridor. At the June 12 meeting of the CAC, Mayor Godwin reviewed with the committee a responsible three-stage process over the summer of monthly notifications of non-compliance and an ensuing daily fine for non-compliance upon reception a third notice. Much constructive discussion on the issue occurred in the Committee's month-to-month deliberations and is recorded in the CAC minutes over the past year. Over the coming year the City and CAC will continue to monitor conditions to assure that the progress made in riparian restoration in this area has reached the point of established practice. The CAC will also actively seek out outside funding to assist the City in protecting these valuable areas from further erosion and environmental degradation.

Natural Resource Management: The CAC spent considerable time discussing the concept of developing a natural resource management plan (NRMP) for the City. The purpose of the was provide City personnel and the City Council with a resource document that would:

1. Qualitatively characterize each natural resource located within the City Limits;

2. Provide guidance toward the maintenance and/or management of the City's existing natural resources; and

3. Provide long-term goals relative to the enhancement, expansion, and restoration of the City's natural resources.

The NRMP was not intended to replace any existing City plan, but rather to be a companion document, reference and/or educational tool. This tool would allow the City to make informed and focussed decisions with regard to its short-term and long-term management of its natural resource.

The CAC would gather the information and solicit the input from City personnel and other State and regional experts on natural resources and generate the document based on the information and assessments provided.

A work plan was developed and discussed (see Appendix C of this Annual Report). Concerns were raised regarding the level of effort associated with the NRMP development, which was estimated to 43 to 47 weeks. In addition, this type of document is normally used for State or Federal parks, refuges, wildlife management areas, etc., not typically local government entities. As such, there was concern as to whether the NRMP would be effective. Furthermore, the highly technical approach by which the resource assessment would be performed also appeared to raise concern.

After considerable discussion, it was decided to table the NRMP for a year or more. Aspects of this concept may be drawn upon for specific applications, such as the assessment of riparian areas within the city.

City of Newark Comprehensive Development Plan: The CAC examined the City's Comprehensive Development Plan II (1987) and expressed concern that it needed updating with regard to natural resources and potential environmental impacts of future development. Mr. Lopata, the Director of Planning, provided a guest presentation to the CAC regarding the plan and how the CAC might provide assistance. The Planning Department was in the process of updating the plan, which became available in late November. CAC members reviewed the update and will provide comment in 2003 regarding environmental and preservation concerns, although these will focus on specific areas and issues.

CAC discussions in late 2002 examined one location with environmental significance and potential, which is the area of the Curtis Paper Mill, the White Clay Creek along Paper Mill Road, the City's water treatment plant, and the new reservoir. This area also includes parkland and portions under the Wild and Scenic River designation, as well as flood plain and designated wetlands. The City has hired a consultant to examine redevelopment of the Curtis Paper site. In 2003 the CAC will continue its consideration of environmentally directed uses for these areas.

2002 CAC Activities Conducted on a Regular Basis

Review of Planning Department Administrative Reports: This regular activity of the CAC is for the purpose of addressing potential environmental effects of development within city limits as

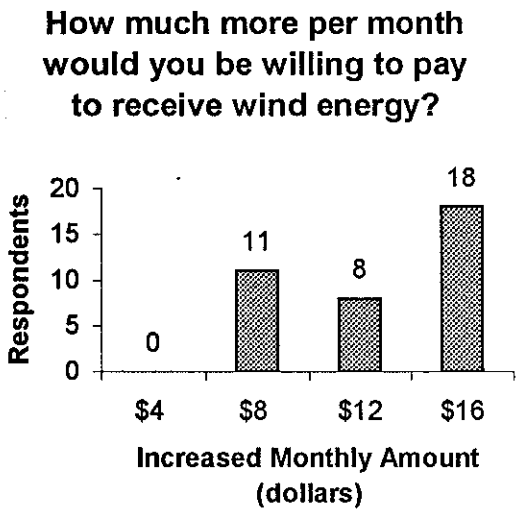
early in the planning process as possible. In 1999 the Planning Department instituted the routine mailing of its weekly reports to CAC members for this purpose. CAC members have attended Planning Commission meetings and spoken to environmental questions as a result.

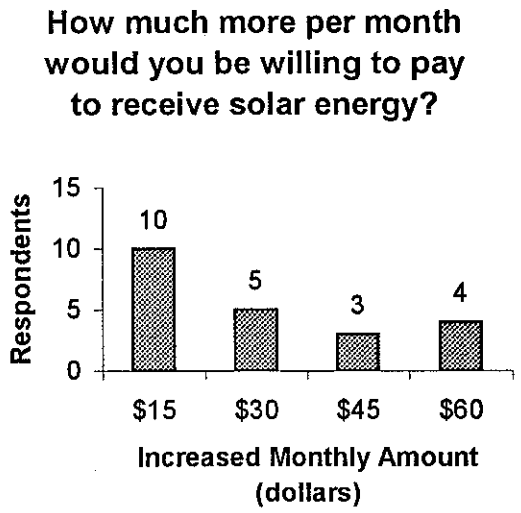
During 2002, the following developmental concerns were addressed, many resulting from Planning department information:

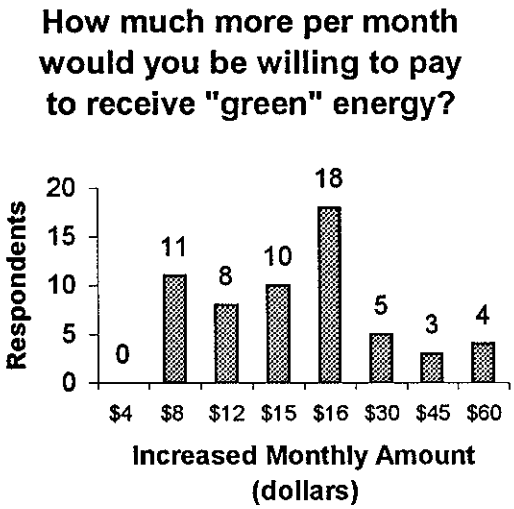
- Outdoor instructional facility at Downes Elementary School: plans reviewed with no concerns expressed.
- Proposed apartment complex on South Chapel: open space requirement to be checked.

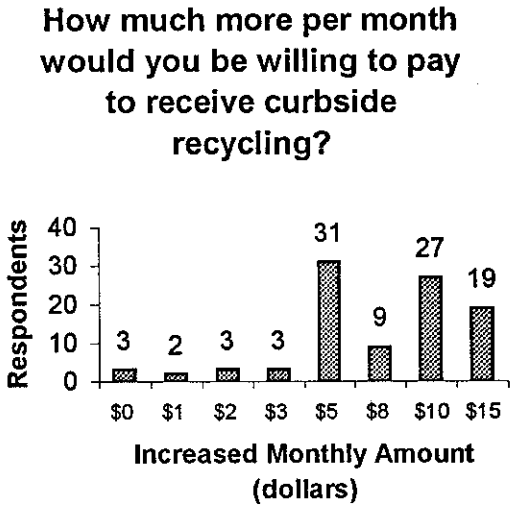
Community Day: The CAC emphasized "green energy" options for the City of Newark at the 2002 Community Day held on Sunday, 29 September. A questionnaire on green energy options was presented in the form of a chart on which citizens placed markers to indicate their willingness to pay extra for these services. Overall, respondents are most likely willing to pay $5-$15 per month extra to obtain these services (results below).

Information on the Adopt-a-Park/Stream Program was also available for distribution and a suggestion box and recycling container were provided at the booth. Internal CAC suggestions for improvement include creating a more "eye-catching" exhibit and placing displays closer to the sidewalk for public access.









Promoting Improvement through the Better Newark Award: Since 1986, the "Better Newark Award" has been awarded quarterly for environmental improvements as well as noteworthy aesthetic improvements. This award includes a proclamation signed by the Mayor and a publicized photo of the property. Nominations are reviewed regularly by the CAC, and winning properties were selected. The winning Newark properties during 2002 were:

- 2 Longwood Lane, Nam Yuk and James Yi
- 108 W. Main Street, The Deer Park Tavern (Robert Ashby)
- 427 Stafford Lane, Linda L. Hagerman

Community Cleanup: The CAC was active in assisting with the city's 2002 Community Cleanup on Saturday, 20 April, from 9 to 11 a.m. 114 volunteers participated in the event. Several local civic groups provided help including Lions' Club, Circle K, Key Club, and Daimler Chrysler, among others. Areas cleaned included:

- Christina Parkway
- Dickey Park
- Elkton Road
- Handloff Park
- Leroy Hill Park
- Library Avenue
- Olan Thomas Park
- Wyoming Road

Overall, the event ran smoothly and many areas were quickly cleaned. Suggestions for next year include a larger sign-in area to accommodate the number of volunteers.

CAC Initiatives for 2003

The CAC looks forward to continuing in 2003 with the following priorities:

1. Respond to directives and requests from the Mayor, City Council, and others within the City government.
2. Beautification: continue administration of the Better Newark Award. Continue with the Community Cleanup program, with improvements as indicated after assessment of the 2002 effort.
3. Conservation: continue to encourage appropriate treatment of riparian corridors in Newark.
4. Green Power: maintain communication with the Finance Department regarding implementation of the plan approved by City Council.
5. Green building practices: work on modifications to the City's Building Code to encourage conservation of heat, cooling, power, and water in new construction.
6. Riparian corridors: the CAC will seek out external funds to assist in protecting and restoring degraded sections of the City's riparian areas, focusing on the Christina Creek.
7. Consideration of environmentally conscientious uses of the Curtis Paper/White Clay Creek areas by the City.

APPENDIX A: CONSERVATION ADVISORY COMMISSION - 2002 MEMBERSHIP

(Three-Year Term)

Steven K. Dentel, Chairperson
69 Kells Avenue
Newark, DE 19711
Appointment by Mayor
Term Expired: March 13, 2000
Reappointed to March 13, 2003
Phone: 737-3939 (H) 831-8120 (B) 831-3640 (FAX)
Steve Dentel <dentel@udel.edu>

Bruce Diehl, Vice-Chairperson
205 Meriden Drive
Newark, DE 19711
Appointment for District 5
Term Expired: March 13, 2000
Reappointed to March 13, 2003
Phone: 368-0790 (H) 773-2841 (B)
Bruce Diehl <Thedeal246@aol.com>

Jane Dilley
106 Tanglewood Lane
Newark, DE 19711
Appointment for District 1
Appointed: April 22, 2002
Term Expired: March 13, 2004
Phone: 731-4163 (H)

Alan Hitchner
905 Pheasant Run
Newark, DE 19711
Appointment for District 1
Term Expired: March 13, 2002
Phone: 292-3658 (H)
Alan Hitchner <ahitchne@csc.com>

Mike Harmer
36 Hawthorne Avenue
Newark, DE 19711
Appointment for District 2
366-0877 (H) 395-5845 (B)
mtharmer@co.new-castle.de.us

Robert B. Bennett
117 Dallas Avenue
Newark, DE 19711
Appointment for District 3
Appointed May 8, 2000
Term Expires: March 13, 2003
Phone: 731-4524 (H) 831-3653 (B)
Robert Bennett <Rbennett@udel.edu>

Kurt R. Philipp
37 Kells Avenue
Newark, DE 19711
Appointment for District 4
Term Expires: March 13, 2003
Phone: 738-7535 (B)
Kurt Philipp <KRPhilipp@aol.com>

Kevin Vonck
132 E. Main St. Apt. # 2
Newark, DE 19711
Appointment for District 6
Appointed June 10, 2002
Term expires: March 13, 2004

Peter Griffin
329 Paper Mill Road
Newark, DE 19711
Appointment for District 6
Resignation accepted Feb. 25, 2002
Phone: 733-7486 (H) 831-0892 (B)
Peter Griffin <griffin@ce.udel.edu>

Peter Drake
12 Plymouth Drive
Newark, DE 19711
Appoinment by Mayor
Appointed August 14, 2000
Term Expires: March 13, 2003
731-0319 (H) 998-7500 (B)
pdrake@chhetrick.com

Douglas Janiec
908 Pickett Lane
Newark, DE 19711
Appointment by Mayor
Appointed June 10, 2002
Term Expires: March 13, 2004
454-1722 (H) 736-9784 (B)
janeichome@juno.com

Appendix B: Green Power Option - Proposal for City of Newark

Conservation Advisory Commission
City of Newark, Delaware

This proposal is in response to a request by Newark's City Council that the Conservation Advisory Commission (CAC) examine possibilities for fostering the use of non-fossil fuels, or a "Green Energy" program. It was prepared by the CAC Chair, Dr. Steven Dentel, and approved by the CAC for submission to the Mayor and City Council.

Introduction

Newark supplies electrical power to almost 11,000 residential, commercial, and industrial customers. All of this power is generated by the combustion of fossil fuels, resulting in both air pollution (sulfur dioxide, nitrogen oxides, carbon dioxide, and particulates) and terrestrial pollution (e.g. strip mining and fly ash generation).

Cleaner forms of energy are available. These include:

- Wind power, generated by windmills, which have become highly efficient. The most productive of these are located where they can tap the winds of Appalachian mountain ridges, but they could be located near the windy shores of Delaware as well.
- Solar power, from photovoltaic (solar) cells, including those produced by a Newark firm, AstroPower Inc. Though more expensive than wind power, this energy source has considerable potential.
- Power produced by the combustion of landfill gas, obtained as a product of the biodegradation of solid waste. The Delaware Solid Waste Authority plans to utilize gas from its Kent and Sussex County landfills for this purpose, and it could be very economical.

Because all of the above are still more expensive than energy from fossil fuels, it is not economically or politically feasible to shift immediately to these alternative sources. However, it is desirable to encourage the generation of electricity from solar and wind sources, to decrease pollution levels and foster the growth of these technologies.

Facts about Newark's' fossil fuel energy consumption	
Number of electrical customers	9500 Residential 1250 Commercial 50 Industrial
Annual electrical production and consumption (Megawatt-hours, 2001)	88,500 Residential 65,500 Commercial 219,100 Industrial (126,100 UD) 373,100 Total
Amount of sulfur dioxide[1] emitted to atmosphere in generating this energy	5,243,000 lb (2,620 tons)
Amount of nitrogen oxides[2] emitted to atmosphere in generating this energy	1,650,000 lb (830 tons)
Amount of carbon dioxide[3] emitted to atmosphere in generating this energy	840,000,000 lb (420,000 tons)
Amount of fly ash produced in generating this energy	22,700,000 lb (11,300 tons)
Amount of particulates emitted to atmosphere in generating this energy	288,000 lb (144 tons)
Pounds of coal mined to generate this amount of power	124,488,546 lb (62,000 tons)
Environmental equivalent	390,000,000 car miles driven, or 30,400,000 trees planted

[1] Sulfur dioxide is a pungent, poisonous gas that can interfere with normal breathing functions even at low levels and aggravate respiratory diseases.

[2] Nitrogen oxides (NO_x) contribute to ground-level ozone pollution and also cause damage to lung tissue, aggravate asthma, and lower the body's resistance to infection.

[3] Carbon dioxide is not toxic but its generation contributes to global warming and the vast problems that will result.

Pollutant quantities calculated according to Rubin (2001). Environmental equivalents from New Wind Energy (2001).

If given the option of purchasing electricity from wind and solar facilities, experience has shown that a small but reliable percentage of electrical customers will choose to do so, even at a significant price premium. These customers can be provided with this choice at no net cost to the City of Newark. Because of its environmental benefits, the CAC recommends that the City move forward in providing this option. We recommend a general approach as described below, to be more fully developed—and implemented—by the Electric Department.

Overview of Proposal

The proposed program has two steps: 1) the customer chooses the desired power option, and 2) Newark provides the overall blend of electrical power from the appropriate energy sources. The customer pays the appropriate cost for the energy from the desired source or sources, and knows that the city has purchased the type of electrical energy that he or she specified.

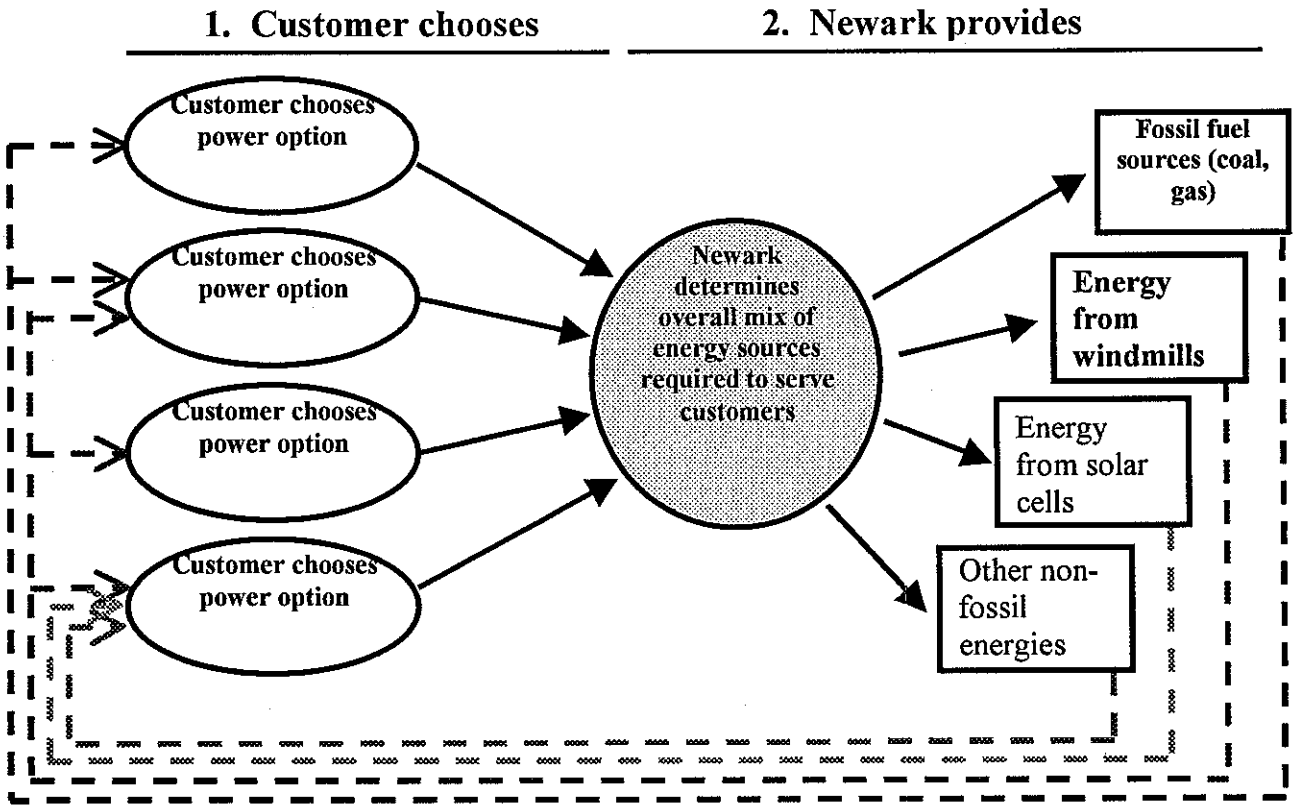


Figure 1. Overview of Green Energy concept for Newark.

Customer chooses: After conducting an educational program to make sure the customers fully understand their options, the City surveys and identifies electric customers who commit to purchasing a specific percentage (or amount) of their electricity from "green" sources at a somewhat higher rate. The commitments are totaled to determine the aggregate demand for each type of electricity.

Options may be of several types:

a) Conventional: this is the current choice, and represents the least expensive source of electricity. This can be assumed to be primarily coal-fired capacity. The current price is approximately 9¢ per kWh.

b) Wind energy: this comes from large windmills, currently operational and providing power on a negotiated rate basis. A proposal to the University of Delaware indicated this price to be about 1.7 cents per kWh above the cost of conventional electrical power.

c) Solar power: this will be obtained from photovoltaic panels installed by the city on its own facilities. The cost is up to 18.5¢ above conventional.

d) Landfill gas: this option is expected to be available as electricity converted from DSWA landfills in Kent and Sussex counties, where the combustible methane is currently being flared off. The cost should be comparable to wind energy.

Newark provides: The City's Electrical Department sums up the selected options and determines the total demand for each type of electrical power. Purchases are contracted accordingly. Total orders for the Green Energy options must be sufficient to allow for contracts to be arranged at the prices given to the customers, and if not, a purchase is not made and the customers are given their default option. It is also conceivable that more power of a certain type may be ordered than can be supplied, and likewise some customers (randomly selected) will be given default selections.

Benefits: Several benefits are anticipated from the implementation of this plan:

1) Energy supplied via green options avoids the significant pollution impacts described previously.
2) Purchases of energy from these sources brings more capital investment into these technologies, which should allow continued cost reductions
3) Diversification of energy sources provides security from future supply or price fluctuations.
4) Investment in solar energy supports local employers.
5) The City of Newark is providing residents with the energy choices that they want, providing greater customer satisfaction.
6) Commercial customers who wish to purchase Green Energy can use this as a promotional and publicity tool.

7) This plan will allow the University of Delaware to purchase Green Energy, as do many other comparable institutions in the mid-Atlantic region.
8) All increases in expenses are built into the premiums paid by customers for the Green Energy options, so net revenue for the City is unaffected.
9) A precedent is set for greater use of clean energies over the years to come, and an example is set for other area communities.

The plan summarized above thus offers much to the city. Although the proposal appears relatively straightforward, there are important questions that must be answered if Newark is to embark on this initiative. These are considered in the following sections.

Is there likely to be interest in purchase of "Green Electricity" when it is more expensive than conventional electricity?

Obviously, the number of interested customers is dependent on the price and appeal of the alternative energy offerings. Figure 2 shows results collected from numerous surveys that confirm this. An average majority of 70% are willing to pay at least $5 per month more for electricity from renewable sources, 38% are willing to pay at least $10 per month more, and 21% are willing to pay at least $15 per month more. These are indications of intent rather than levels of actual participation. However, at least one option suggested in this proposal may require a premium of only $3 per month. Consequently, participation is expected to be significant, and certainly sufficient to warrant implementation.

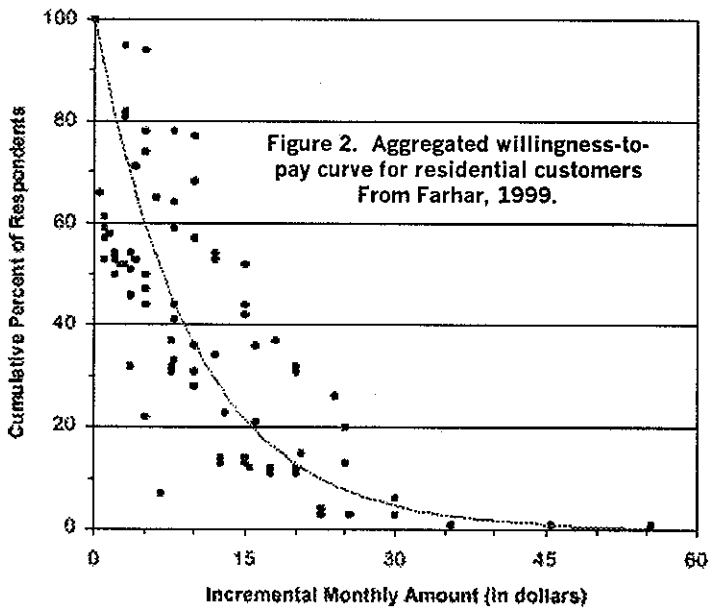


Figure 2. Aggregated willingness-to-pay curve for residential customers From Farhar, 1999.

For planning purposes, we suggest a very conservative estimate of 2% participation, with an average purchase of 25% green electricity. This is based on reports of actual participation in existing programs, indicating levels between 1-5%. Assuming the participants are at the average level of consumption, this would be equivalent to 0.5% of total electrical purchases. Although it may seem counter-intuitive, commercial electric customers have been significant participants in such

programs elsewhere, so this percentage should be assumed for the total of residential and commercial customers.

What is the estimate for how much green electricity would be purchased?

Newark sells approximately 88,500 Megawatt-hours of electricity per year to residential customers and 65,500 Megawatt-hours to commercial customers. At 0.5% of the total 150,000 Megawatt-hours, this is 750 Megawatt-hours per year, or 750,000 kWh per year. This assumes that no industrial customers (roughly 220,000 Megawatt-hrs per year) will participate.

The 750,000 kWh per year can thus be conservatively averaged to 85 kWh/hr (750,000/(365x24), or simply 85 kW, that participants would commit to purchasing as more expensive "green electricity."

Are there ways to increase the purchase of "Green Electricity" beyond this estimate?

Participation is dependent on more than price. Increased participation is likely if other aspects of the program are properly developed to take these factors into account. These include:

- Building of public awareness through publicity and education efforts
- Ease of participation, with simplicity rather than complexity
- Use of public recognition programs for both residential and commercial participants
- Linkage of the added electrical payment to development of a visible, local facility, such as solar panels
- Association of the program with civic pride and environmental awareness
- Pricing arrangements that include protection from potential increases in fossil fuel prices.

Experience elsewhere indicates a high degree of participant loyalty to a well-run program, and increased participation is likely over time if the above features are included. Increases in fossil fuel prices, or unforeseeable security issues, could also increase participation.

Would the University of Delaware be involved?

The University of Delaware is classified as an industrial customer, and it purchases as much electrical power from the city as all other commercial and industrial customers combined. Many other comparable institutions in the mid-Atlantic

states are purchasing up to 5% of their electrical power from green sources. If UD should also take this step, demand for green electricity might be multiplied by a factor of 5-10 beyond the above estimates. However, UD has been presented with proposals from both internal and external sources and has not indicated interest in green energy purchases to this point.

Why are three different Green Energy sources proposed?

At this point, each option appears to have distinct advantages and disadvantages, which may be summarized as follow:

Green energy option	Features	Drawbacks
Windmills	Available immediately Low additional cost	Not locally generated
Solar panels	High visibility Local supplier possible Local expertise	High cost High effort
Landfill gas	In-state sources Low additional cost	Not available immediately

Because of these differences, it is best to consider all options at the outset. If the City chooses to go forward with this program, it may be determined that the alternatives be more limited.

How much will Green Electricity cost?

First, the baseline costs for electrical customers should be known. Currently, commercial and residential customers pay an average of 9¢ per kWh of electricity. For a typical residential customer's usage level, this corresponds to an electric bill of $67 each month. This monthly cost, using fossil fuel sources, can be considered as the "baseline" cost.

Figure 3 shows a tentative example of the choices that customers might be offered, including the baseline option. Various price levels beyond this baseline would be provided, utilizing various mixes of energy sources. The figure includes a low-cost option for customers who may want to support the program but cannot afford a significant commitment. It offers a 100% green power option using wind power, and also a more expensive option to support solar power. In this example, the "premium" paid by the customer would range from $3 per month to $35 per month.

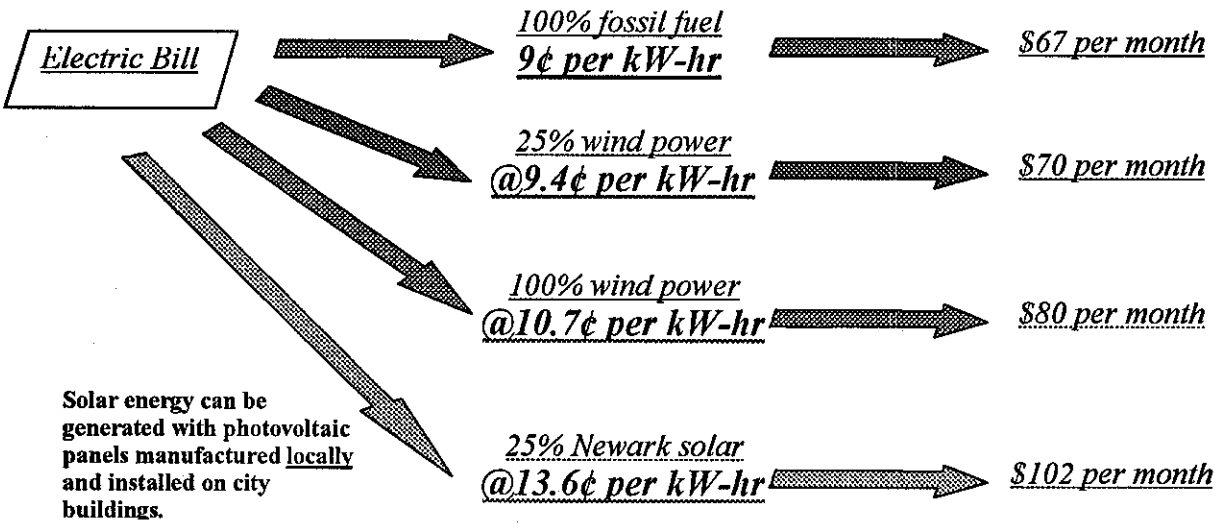


Figure 3. Examples of costs as calculated for various energy options for customers.

The above example also implies that the "premium" should be set as an increment above the existing fossil fuel cost. Although the "premium" is a useful concept for comparison purposes, the actual pricing for a green energy option should not be set in a way that causes it to increase just because the baseline cost for fossil fuels has increased. Customers are more likely to make a commitment to green energy options if they know that this protects them against such effects.

Where did the cost estimates come from?

The cost estimates shown in Figure 3 are approximate but reasonable. Sources are as follow. Where cost information has been obtained from specific firms, these are intentionally left anonymous to avoid potential difficulties from bias or conflicts of interest. These entities can be identified in the future as appropriate.

a) Conventional: The current price of approximately 9¢ per kWh is from calculated using data from the Energy Information Administration of the Department of Energy (see References, Appendix 2). The dollar revenue is divided by the kWh sales to give the average revenue per kWh. These figures are separately available for residential, commercial, and industrial customers. More recent data provided directly from the city agrees with the DOE numbers.

b) Wind energy: The cost per kilowatt hour for wind-generated electricity was based on proposed rates tendered to the University of Delaware by a direct supplier, assuming a purchase of 6 million kWh per year for a contract period of five years. A purchase by Newark would probably be a fraction of this (unless the University of Delaware were to participate), and the actual cost would depend on

the level of participation. Costs specific to the City of Newark, at probable purchase levels, should be solicited from this supplier and others.

c) Solar power: This cost is the most approximate. It assumes that Newark would purchase the necessary solar panels and ancillary equipment and either install them or contract for this to be done. The panel and installation costs are based on informal discussions with a representative of a local photovoltaic supplier.

Such an installation appears quite feasible. The city has very good locations for solar panels, such as the south-facing roof of a city garage. Discussions with Newark officials have tentatively cleared this location for use, although others with more public visibility might also be sought.

The general method for the cost analysis is from Herig et al. (2001) along with assumed factors for rate increases and maintenance factors. The final cost figures were considered to be reasonable by an outside expert familiar with solar energy costs. The estimate was also reviewed by a representative of Newark's Finance Department, who indicated the general approach is valid, but that the current state of the market makes it difficult to make any long-term pricing forecasts. This difficulty is inherent in all of the cost estimates presented here, including the baseline cost using coal.

More detail is presented on the cost estimate for solar electricity in Appendix 1. The appendix also makes note of factors that could lead to reductions in the estimated cost for the solar option.

d) Landfill gas: The Delaware Solid Waste Authority has recently solicited proposals to convert waste gases from its landfills in Kent and Sussex counties, where the combustible methane is currently being flared off. Five finalist proposals are being reviewed as of November 2002.

The bidding entities would be responsible for both the conversion and marketing of the electricity, and have therefore explored options within and beyond the State of Delaware for sale of the electric power. One of these companies provided the CAC with a proposal it tendered to the City of Dover, which Dover did not act upon. The costs presented in that proposal indicated a price comparable to wind energy and possibly lower (other web-based literature appears to confirm this). Discussions with representatives from this company confirmed that a comparable cost would be available to the City of Newark. These representatives also pointed out that an outside contractor could provide and manage an overall portfolio of green energy options for Newark, if the city were to prefer such an option.

Why offer solar power if it is so much more expensive?

As indicated previously, the solar energy option has the advantages of high

visibility and local sourcing. The high cost estimate presented here is based on a relatively simple cost analysis as detailed in Appendix 1. This estimate did not include:

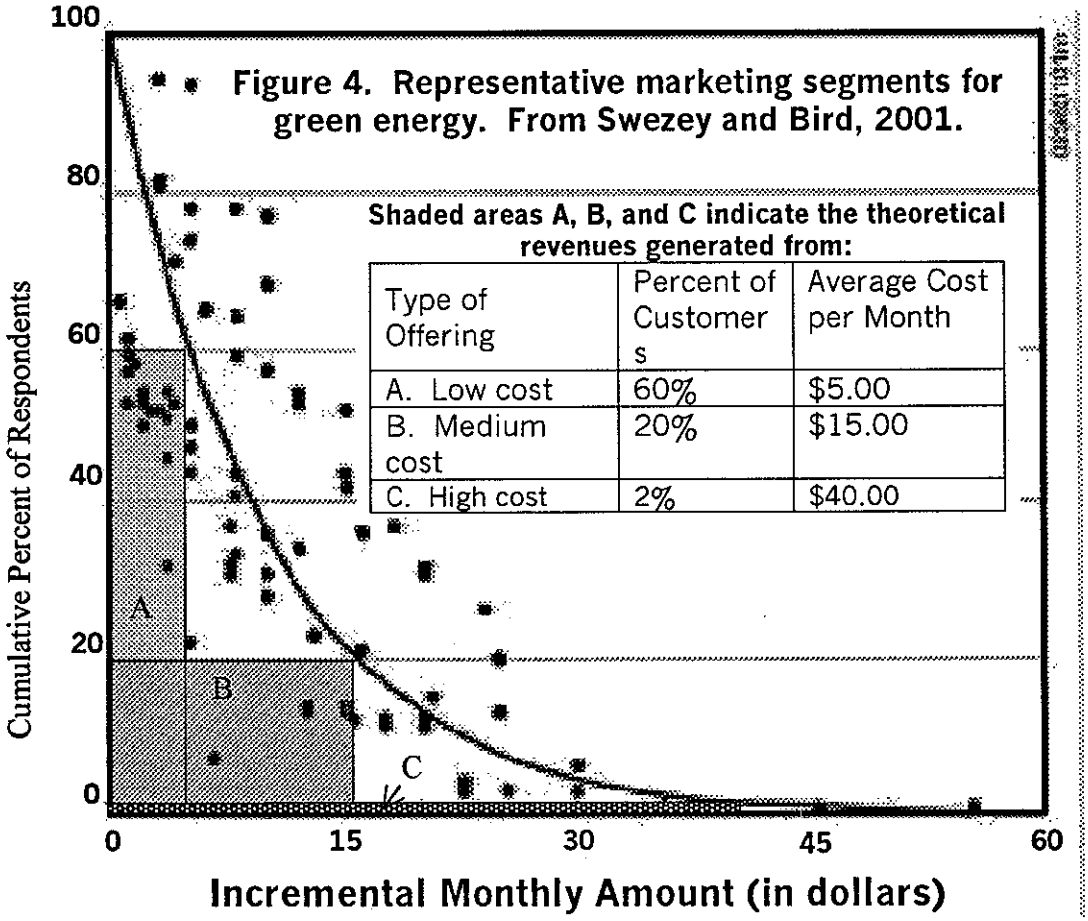
- Possible discounts or subsidies by Astropower, the leading independent manufacturer of solar panels, and located in Newark.
- Savings to Newark from solar power due to "peak-shaving." This is due to the fact that peak demand service—the electricity purchased when usage and demand are highest—are a large share of power costs, and "photovoltaic systems are well suited to reduce this cost because their maximum output coincides with those periods of the day and year when ...loads are typically peaking" (Byrne et al., 1999).*

Consequently, solar energy should be maintained as an option, and a more detailed cost estimate obtained. This will require study by Newark's Electric and Finance Departments, possibly assisted by the Center for Energy and Environmental Policy at the University of Delaware. The bottom line is that the cost premium for electricity generated by this facility must be set at a cost that will pay for its installation and maintenance, as well as assuring the income from electrical power sales that Newark relies upon.

In addition, this proposal is based on the demonstrated fact that a certain percentage of electrical customers will purchase electricity based on environmental and other concerns and not on price. Figure 4, for example, suggests that the customer characteristics shown in Figure 2 may be indicative of market segments. Offering a palate of green energy choices could attract more interest.

* A study that included saving from peak-shaving on the costs of installing photovoltaic facilities on state government buildings in Delaware (Byrne and Boo, 1999) found that payback periods were typically reduced from 15-16 years to 4-5 years, including the cost of uninterruptible power supply equipment.

Thus, if solar power is local, visible, and philosophically appealing, it may attract a clientele even at a relatively high cost. It may be appropriate to give the electrical customers this option, even if its cost is steep. And in Figure 3 the high cost is



mitigated by including it as only 25% of the selected portfolio. In fact, a lower percentage, such as 10%, could also be used.

How Can the Green Energy Plan Be Implemented?

Figure 5 presents the anticipated steps to complete. A period of roughly one year is expected to get the program operational.

Study by the Electrical and Finance Departments should begin the project, with CAC assistance. An estimate of the level of participation may be obtained by including a questionnaire with electrical bills, although the explanation and environmental importance of this program will need to be explained in a straightforward and appealing manner. The customers may be asked how much of

this electricity they would commit to, as a percent of their overall purchase, given two or three pricing levels. Commercial customers would need to know potential advantages of participation for purposes of public relations as well as the environmental benefits.

The Finance Department will need to examine the costs and income from the program, and determine whether the issuance of bonds is feasible, particularly if a larger initial facility were to be planned. Cost projections appear to be highly sensitive to interest rates and rates of likely increase in electrical rates. Perhaps most importantly, the capability of a solar facility to assist in "peak shaving" when electrical costs are highest must be included if the benefits of the solar panels are to be accurately assessed.

Several crucial issues must be addressed during these steps:

- Based on the features and drawbacks tabulated earlier, and on a variety of other considerations, what energy options should be offered to Newark residents and commercial customers?
- Can the city implement the solar alternative in-house? If not, should it be contracted out?
- How can initial price estimates be presented to customers? If price estimates are overly pessimistic, customers will not be interested in participating, the overall commitment will be low, and the resulting price will be high. Can this self-fulfilling prophecy be avoided?
- What are the best strategies for cost-effective advertising? How can an interested clientele best be made aware of the options available?
- How are the individual costs for the different options differentiated by the City? For example, how are personnel costs allocated between the energy sources?

These questions have been addressed by other companies and municipalities, so one approach that will be needed is to learn from the experience of these other entities. And it should be recalled that the City of Newark has embarked upon larger and more complex projects than this many times, and has succeeded.

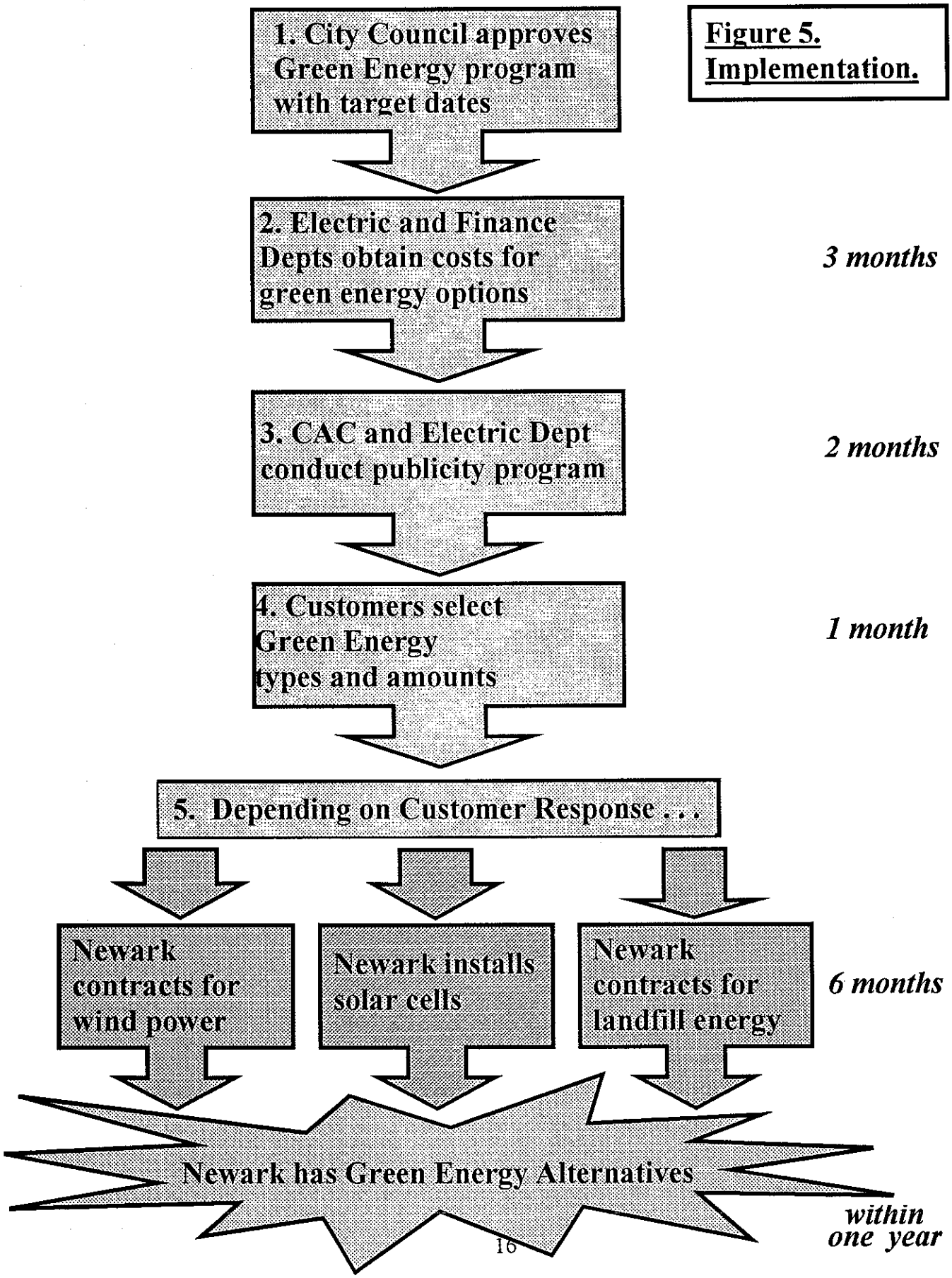


Figure 5. Implementation.

Why should the City of Newark go to this trouble?

Deregulation of electrical utilities has been accompanied by the offering of green energy choices to electric power customers in many locations. The demand for these choices is still growing, and this has driven prices down. Green energy choices can now be made available to Newark customers at reasonable costs. Other utilities—including municipalities—have already paved the way for this type of program. Unlike other environmental programs that a city can undertake, this one is paid for by willing customers.

It can be argued that the higher costs of developing cleaner energy sources should be universally borne since the benefits are equally shared. And yet, if the political will for this philosophically correct approach cannot be amassed, the only other alternative is inaction. This proposal is pragmatic in suggesting that, for the near future, voluntary subsidy of alternative energy sources may succeed in driving prices down while fostering acceptance of alternative energy supplies. In the longer term, this should help make green energy available for all.

Appendix 1. Basis for photovoltaic cost estimate

The projected premium for green electricity is considerably higher than estimated for wind or landfill gas options. The primary cause is capital costs of initial purchase of solar panels. The cost per kWh was estimated by amortizing this investment, and including other factors such as maintenance costs. A spreadsheet was developed for this purpose and can be provided by request.

The calculations assumed a capacity of 85 kW, equal to the total amount of green energy estimated to be request by customers. Because much of the equipment for photovoltaic installations is modular, similar unit costs are likely regardless of the overall capacity to be installed.

The estimated 85 kW would correspond to approximately 5,600 square feet of solar panels, and other capacities would involve roughly proportional panel areas. Based on estimates from Astropower, the cost per watt is $10 for smaller areas and might be as low as $8 for the larger area. An Astropower representative has also suggested that the purchase of this amount of photovoltaics be spread over a number of years, since the total cost of $700,000-$850,000 is unlikely to be borne as one outlay. A facility as small as 9 kW (600 square feet, at perhaps $90,000) could be constructed initially, with a substantial waiting list of customers for additional solar energy to be added over time.

Table 1-1. Assumptions in Cost Calculations

Assumption or Calculated Quantity	Value used	Units used
Average amount charged to customers for "green" electricity	27.5	¢/kW-h
Maximum capacity assumed for Newark photovoltaic facility	85	kW
Capital cost for photovoltaic facility (per watt of max capacity)	$8	$/W
Total capital cost for Newark photovoltaic facility	$680,000	$
Hours of sun on a sunny day	6	Avg. hrs sun/day
Electrical power generated on a sunny day	510	kWhrs/day
Solar energy revenue on a sunny day	$140.25	$/day
Average number of days each year with 6hrs of sun	263	Days/yr
Solar energy revenue per year	$36,886	$/yr
Interest rate	5.0 %	
Elect Rate Increase/yr	2.0 %	

Costs are dependent on the interest rate assumed and on the cost of solar panels. Currently, Conectiv customers are eligible for a 30% subsidy on photovoltaic installations, but municipalities or their customers are not: such a subsidy would reduce the cost to 19.5¢ per kWh. No governmental funding assistance programs could be located that would provide any support for photovoltaic installations such as the one proposed. The number of years is also a critical aspect of the calculations, because the solar panels and other installed facilities must be usable over this lifetime.

Table 1-2. Cost over 35-year Amortization Period for Full 85 kW Facility Using Assumptions in Table 1-1.

Year No.	Net Income	Net Present Value	Year No.	Net Income	Net Present Value
0	-$680,000		18	$49,242	-$191,009
1	$35,544	-$615,379	19	$50,190	-$172,093
2	$36,235	-$584,078	20	$51,157	-$153,730
3	$36,939	-$553,688	21	$52,141	-$135,906
4	$37,656	-$524,183	22	$53,144	-$118,604
5	$38,387	-$495,538	23	$54,166	-$101,809
6	$39,132	-$467,728	24	$55,206	-$85,506
7	$39,891	-$440,728	25	$56,266	-$69,682
8	$40,664	-$414,516	26	$57,345	-$54,322
9	$41,451	-$389,069	27	$58,445	-$39,413
10	$42,254	-$364,364	28	$59,564	-$24,942
11	$43,071	-$340,380	29	$60,705	-$10,897
12	$43,905	-$317,097	30	$61,866	$2,736
13	$44,753	-$294,493	31	$63,049	$15,968
14	$45,618	-$272,550	32	$64,253	$28,810
15	$46,499	-$251,248	33	$65,480	$41,275
16	$47,396	-$230,570	34	$66,729	$53,372
17	$48,310	-$210,496	35	$68,001	$65,113

Appendix 2. References

Byrne, J. and Boo, K-J. High Value Photovoltaic Technology Options for Public Facilities in the State of Delaware." Center for Energy and Environmental Policy, University of Delaware (1999).

Byrne, J., Wicker, K., Boo, K-J., Agbemabiese, L., and Nigro, R. High Value Photovoltaic Technology Options for Four U.S. Environmental Protection Agency Facilities." Center for Energy and Environmental Policy, University of Delaware (1999).

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Appendix C. CAC Work Plan for a Natural Resource Management Plan

CAC LEAD: Douglas Janiec

I. INTRODUCTION

The City of Newark (Newark) takes great pride in its natural resources and its ability to conscientiously manage them. Newark has created City Code to protect natural resources and has developed guidance documents, such as its Comprehensive Development Plan II, to aid in the their protection. However, many of the City Codes and the guidance documents have not been reviewed and/or updated since the 1980s or earlier. To date, it is not clear as to whether Newark's Codes and management plans are still providing the maximum level of protection to its natural resources. Furthermore, it is not clear as to whether the residents, City Council, CAC, and the City Government has a full understanding of diversity and quality of their natural resources. These questions are not do to the lack of planning or effort historically made by the City of Newark, but rather it's a result of the advancements in the science and economics of resource management made since the 1980s. With the current state of the science, there is sufficient potential that the City of Newark could improve its resource management. As such, this work plan has been developed to address these questions.

Over the past twenty years, large strides have been made in the area of natural resource management. The state of the art has provides a means to characterize and manage natural resource through the development and application of a natural resource management plan.

A natural resource management plan provides:

- A characterization, inclusive of a qualitative assessment of each natural resource;
- A means to maintain and/or manage the existing natural resources; and
- Long-term goals with regard to enhancing, expanding, and restoring our natural resources.

Development of this plan would be coordinated with the City Council, departments of the City of Newark government, State and Federal resource agencies, and private entities.

APPROACH

A. City Council Endorsement and Approval

The development of a comprehensive natural resource management plan is a significant effort. As such, the CAC will seek formal endorsement and support from the City Council prior to initiating this effort. This work plan will be submitted City Council. The City Council will be requested to place this project on the next Council Meeting agenda. If support is gained from the City Council, the effort will proceed. If support is not acquired, the project will be terminated.

B. Preliminary Literature Review

Assuming City Council support was provided, the CAC will immediately begin obtaining, reviewing, and summarizing all readily available data on the City of Newark's natural resources. Available data and information on surface water,

wetlands, groundwater, terrestrial and aquatic wildlife, ecological areas, open space and parkland, historic and archeological sites and corridors will be obtained from City, State, and Federal agencies and other non-regulatory entities. Initially, the following agencies will be contacted:

City of Newark Government;
Delaware Department of Natural Resources and Environmental Control;
Natural Resources and Conservation Service;
U.S. Fish and Wildlife Service;
National Park Service;
White Clay Watershed Association;
Delaware Native Plant Society;
Delaware Horticulture Society;
The Nature Conservancy;
State Historic Preservation Office;
Newark Historical Society;
Delaware Historical Society;
University of Delaware; and
Other select natural resource specialists.

The CAC will compile the data and information and continue to acquire additional information through steps C, D, and E. This effort will result in a comprehensive characterization of the City of Newark's natural resources. It will also result in Part I of the resource management plan, i.e., "Part I – Natural Resource Characterization."

The characterization will describe each natural resource type individually and, when applicable, will describe each natural resource composite. An example of a composite would be a City park. The park may contain surface water, open space, terrestrial and aquatic wildlife, and an archeological site, each of which is a separate natural resource. Composites are very important because their value often exceeds the summations of all the natural resources.

C. Development of Models

Once the draft characterization is completed for the natural resources, each natural resource within a type and natural resource composite group will be evaluated to determine its quality, and/or value. For example, two of the City of Newark's surface waters are the White Clay Creek and Christina Creek. Although the White Clay Creek may have a greater value in terms of drinking water supply, it may not be as valuable relative to flood plain/flooding issues. Modeling the streams in terms of all their functions will enable resource managers to better understand the importance and needs of the natural resources within a natural resource type.

The modeling technique will be similar to the approach used by the Hydrogeomorphic Modeling Technique (HGM). The HGM approach identifies each major function of the natural resource. A scoring formula is developed for each major function. The cumulative score of all the functions provides a total

score for the natural resource. Unlike the HGM approach, the scores of the natural resources will not be compared to a reference site, but rather relative to one another. For example, the cumulative score of the functions of the White Clay Creek will be compared to that of the Christina Creek.

The modeling provides much more than a simple total score comparison. It also allows for the individual functions to be compared to identify the strengths and weaknesses of a natural resource. This allows the City of Newark to focus its resources on a natural resource's greatest need, and realize "the biggest bang for the buck."

Furthermore, it provides a means to track the health and effectiveness of the natural resource management. The natural resources can be re-scored every five years and be compared to the previous score results.

The function scoring formulas that will be used will be, or will be similar to, formulas already developed and tested, when possible. They will be objective, yet allow a limited level of professional judgement by the experts scoring the natural resource. This effort will comprise the first portion of Part II of the resource management plan.

D. Critical Decision Point 1

Upon completion of the draft natural resources characterization and models, City Council, applicable City Government departments will be provided an opportunity to review and comment. The CAC will incorporate the comments and finalize Part I and the models.

E. Resource Coordination with Model Application

Upon finalization of Part I and the models, the CAC will request the models to be scored by regional experts. The regional experts will be individuals or agencies representative of our City, State, and Federal Government. They may also be individual from the private sector having a specific and recognized expertise on a particular natural resource. As a general rule, the CAC will not score any model. It is the goal to have more than one individual score each resource or resource group. The average of the scores of each natural resource will be used as the final score. This approach will reduce the chances of bias.

F. Resource Response Compilation and Evaluation

Once the model scoring has been completed and returned to the CAC, the results will be compiled in tabular form. Each resource will be discussed in a narrative. City Council and the City Government will be provided a draft of the above noted.

G. Critical Decision Point 2

Upon review be City Council and the City Government, comments will be incorporated into the natural resource evaluation. The final modeling report will comprise the remainder of Part II. As such, Part II will be finalized.

H. Developing Management Strategies

Based on the findings of Part II, the CAC will develop proposed management strategies. These strategies will focus on the annual maintenance of the natural resources and serve as a guide for City Council and the City Government. This effort will be closely coordinated with the appropriate departments within the City Government.

I. Provide Recommendations to City Council

The findings of the Part II may also identify weaknesses associated with the present City Codes. In such cases, the CAC will draft recommended Code amendments and present them to City Council for further action.

J. Critical Decision Point 3

The management strategies and City Council recommendations will be provided to City Council and the City Government for comment and consideration. The management strategies will be modified as required. The recommendations will be requested to be discussed at a Council Meeting(s). Upon completions of the above noted, Part III will be finalized.

K. Long-term Management Planning

The final Part of the resource management plan is the long-term management planning. This is the master planning of our natural resources. It will identify the City of Newark's natural resource priorities and goals. It will identify enhancement, restoration, and expansion opportunities for its natural resources.

L. Critical Decision Point 4

The draft of Part IV will be provided to City Council and the City Government for comment. Once the comments have been incorporated, Part IV will be finalized.

M. Natural Resource Management Plan Adoption

Once Part IV is finalized, the plan will be completed. It will be presented to City Council. City Council will be requested to adopt the plan as the official City of Newark guidance document for natural resources management.

SCHEDULE

A. City Council Endorsement and Approval
The first opportunity the work plan can be placed on the City Council Agenda.

B. Preliminary Literature Review
Within 12 weeks following City Council Endorsement and Approval.

C. Development of Models
Within 18 weeks following City Council Endorsement and Approval.

D. Critical Decision Point 1
The first opportunity the work plan can be placed on the City Council Agenda following completion of Steps B and C.

E. Resource Coordination with Model Application
Within 6 weeks following the completion of Critical Decision Point 1.

F. Resource Response Compilation and Evaluation
Within 10 weeks following the completion of Critical Decision Point 1.

G. Critical Decision Point 2
The first opportunity the work plan can be placed on the City Council Agenda following completion of Steps E and F.

H. Developing Management Strategies
Within 8 weeks following the completion of Critical Decision Point 2.

I. Provide Recommendations to City Council
Within 11 weeks following the completion of Critical Decision Point 2.

J. Critical Decision Point 3
The first opportunity the work plan can be placed on the City Council Agenda following completion of Steps H and I.

K. Long-term Management Planning
Within 12 weeks following the completion of Critical Decision Point 3.

L. Critical Decision Point 4
The first opportunity the work plan can be placed on the City Council Agenda following completion of Step K.

M. Natural Resource Management Plan Adoption
The first opportunity the work plan can be placed on the City Council Agenda following completion of Step L (two weeks).

The total duration of this effort is estimated to take 43 to 47 weeks.

IV. FEES AND CITY GOVERNMENT SUPPORT

The only monetary costs pertaining to this effort would be associated with reproduction fees charged by resource agencies for copying expenses. For example, the State Historic Preservation Office typically charges a per page fee for information copied at their office. The City of Newark will be requested to cover these charges.

Four types of City Government support will be requested:

1. Government personnel will be requested to coordinate with the CAC as needed. This coordination may involve short informal meetings and extended meetings, especially during the modeling preparation and review of comments;
2. The City of Newark will be requested to periodically reproduce copies of draft documents that will be provided to the City Council and City Government personnel;
3. Depending on the type and volume of information acquired, the City Government may be asked to generate map, diagrams, and/or simple plans for the natural resource management plan; and
4. The Mayor will be requested to sign information request and assistance letters that the CAC will draft. These letters will be sent to the various agencies and private entities for support during this effort.

No other fees or City Government support is anticipated.

APPROVAL

The above note work plan has been reviewed by the CAC. Based upon a majority vote of ____ for/_____ against, this work plan has been:

_____Approved without modification.

_____Approved with modification (see attached modifications).

_____Denied (see attached rationale).

_____ _____

Chairperson Date