



Transforming a 'First' Suburb: City of Falls Church, VA Demonstrates How to Become Sustainable with Zero-Net Energy

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Introduction

Spurred on by a growing consensus of the threat of climate change to our planet, the urgency of finding solutions to mitigate greenhouse gases and reduce our dependency on foreign oil, and the realization of the economic and workforce benefits of the next wave of sustainable technology, there is currently a creative spurt and growing momentum in the U.S green tech industry. Many powerful and exciting conservation and efficiency technologies for all categories of non-renewable resources, including water, are in the commercial stages, ready to be deployed, while others are in the development stages waiting to be tested.

The development of a low carbon, sustainable society, as well as green tech industry global leadership by the United States will occur as communities adopt and integrate energy efficiency and green tech best practices and in doing so, grow the green tech market that will support a new green tech workforce. Community adoption of sustainable practices, green tech market development, and the growth of a green tech workforce can be accelerated by jump starting a Falls Church “city-wide” zero-net energy technology demonstration program. Such a city-wide program would demonstrate the impact of integration of renewable energy, residential and commercial building energy efficiency, energy distribution technologies, alternative fuel transportation programs, water conservation best practices, green tech workforce development, sustainable development zoning and building codes, financial incentive programs, and combined with significant leveraging of the private sector through public-private partnerships. In addition, such a demonstration city would be a model for how a single municipality’s efforts can be multiplied through regional replication across the country.

As an inner ring suburb, defined as such by its proximity to the urban core for which it was once a bedroom commuter community, City of Falls Church has the best and the worst of the older “first” suburb attributes, quantified in the 2006 study by the Metropolitan Policy Program of The Brookings Institution and co-authored by local Falls Church resident, Robert Puentes¹. The city is experiencing the transformation from typical bedroom suburb to a new urban environment where sustainable development must be well planned for future generations who will only know their city to be urban.

In this context, the City of Falls Church, Virginia is uniquely qualified to be a Sustainable, Net-Zero Energy Demonstration City, having the optimal scale, broad community support, political leadership and proximity to green tech industry associations, a regional high tech industry, world-class educational institutions, and the Nation’s capitol. The City is motivated and able to move quickly from a design and planning phase into implementation because of our size, technical content experts, strategic business partnerships, strong citizen involvement, and the following attributes:

¹ “One Fifth of America: a comprehensive guide to America’s first suburbs”. Brookings Institution, 2/2006, Survey Series, David Warren and Robert Puentes.

- 2.2 square miles at strategically located “inner ring” suburban intersection of commuter routes and public transit hubs
- Approximately 1,200 businesses and over 11,000 residents
- Citizen-driven commitment to education, sustainable development and environmental practices; USA top 5 percentile per capita graduate degrees
- Well-established municipality with highly functional governing body; City Manager staffing model
- Flexibility and agility to enact change quickly
- Proven track record for more than a decade of public-private incremental efforts with growing velocity in the past three years
- 2005 Twenty Year Vision Statement pledge to facilitate sustainable development, environmental harmony and conservation through regulatory actions, public education and demonstration programs, land use tools, tax incentives

Goals:

1. Develop a city-wide zero-net energy demonstration program that integrates city building codes and policies, energy efficiency, renewable energy, water conservation, alternative fuels and transportation programs, energy distribution technologies, workforce development, financial programs, and the leveraging of the private sector through a public-private partnership - the Falls Church Energy Alliance.
2. Create a city-wide working platform where U.S. clean energy technology companies with commercially available products can demonstrate the effectiveness of their products in a real world setting, and where the city can measure and monitor effectiveness and reductions in greenhouse gases.
3. Provide federal, state and local government leaders, community stakeholder organizations, industry associations, business leaders, and the investment capital community a dynamic, integrated and sustainable city-wide environment where they can see commercially available green technology in use in a real world setting, as well as demonstrations of developing future technologies and innovative models such as municipal solar plants and Purchase Power Agreements and other financial models.
4. Extend the regional impact of the City’s zero-net energy demonstration program through outreach with the Metro regional councils, as well as collaboration with Virginia solar and wind power producers and manufacturers, Virginia clean energy research centers, and mountain and coastal communities of Virginia that could benefit from economic development and green workforce development associated with solar manufacturing facilities, municipal solar power plants, terrestrial wind farms and offshore wind technology development and manufacturing.
5. Extend the national impact of the City’s zero-net energy demonstration program through an active program of outreach with national community and sustainability associations, as well best practices dissemination through Web 2.0 technology.

Strategy:

1. Jump-start the development of a city-wide net-zero energy demonstration program in Falls Church, Virginia and create new green tech jobs through funds from the Department of Energy. Requested funds from Department of Energy program will enable the City of Falls Church to:
 - a. Jump start investment in an advanced renewable energy portfolio of technologies;
 - b. Implement best practices in energy efficiency in our residential and commercial facilities;
 - c. Install smart meters to empower residents to monitor and modify their electricity consumption;
 - d. Collect and share research data to understand the feasibility of and identify the most practical measures;
 - e. Expand the application of alternative energy technologies; and
 - f. Educate and promote the environmental and financial value and viability of a zero-net energy City.
2. Create the Falls Church Energy Alliance, a public-private partnership. The Alliance will:
 - a. Facilitate the real estate development of the Falls Church Net-Zero Energy Technology Center. The Center will:
 - i. house a green workforce training facility in collaboration with Virginia community colleges, colleges and Universities
 - ii. facilitate green tech small business development center and business incubator,
 - iii. organize offices for green tech companies and companies demonstrating their products in the City,
 - iv. facilitate satellite green tech research and demonstration labs of Virginia Universities,
 - v. serve as a green tech economic development office for Virginia communities promoting their communities,
 - vi. become a demonstration center highlighting regional green tech initiatives, and
 - vii. be a U.S. net-zero energy community technology transfer center where communities from across the U.S. can send leaders from local government, citizen stakeholder organizations, and economic development organizations for seminars and training.
 - b. Engage the active participation, in collaboration with the City of Falls Church Chamber of Commerce, of the City of Falls Church business community as Members and Sponsors of the Alliance.
 - c. Engage the active participation of the U.S. green tech industry, industry associations, venture capital community, financial institutions, Virginia colleges and universities, and Virginia communities as Members and Sponsors of the Alliance.
 - d. Act as the Secretariat for a separately branded Web 2.0 social network that will facilitate, quantify and aggregate the energy and greenhouse gas impact of the City's program, as well as provide outreach to other communities and facilitate the replication of net-zero energy best practices and city wide initiatives in communities across the U.S.

Smart City

In keeping with the belief that City of Falls Church is the ideal place to fully demonstrate a wide range of programs and technologies designed to transform the community into a model of energy and water saving efficiencies and conservation measures, the success of this plan depends 100% on the commitment of the city's residents and business owners to transform their municipality into a sustainable SMART City. Building on the familiar acronym, SMART (Specific, Measurable, Action-oriented, Realistic, Time-bound), City of Falls Church citizens will be drawn in as stakeholders and "owners" of all the programs and plans to contribute to the over arching goal to become a demonstration city for the next generation of those who will be served by the conservation and sustainable technologies of today. Dramatic reductions in carbon emissions, energy use, water supply use, wasteful environmental practices will be achieved to the extent that the citizens and stakeholders of Falls Church take hold of a sustainable life style and make it their own. No public or private entities can enforce the type of lifestyle change required for City of Falls Church to meet its sustainable community goals. The next three years will bring power to the people as they are educated to grab hold of the vision that has been clearly stated and demonstrated by Falls Church community leaders in recent years.

To initiate and sustain a SMART City, requested funds will be spent to provide:

- Technology introduced into the homes and businesses of each Falls Church resident for their participation
- Data collection functions at each installation (@6,000 hook ups)
- Broad dissemination of data and information designed to engage each household to know and "manage" their own use
- Education and interactive projects in the public schools for students at all curriculum levels,
- Citizen outreach through all local media and face to face venues,
- Job training
- Neighborhood conservation campaigns and contests

As a result of the early investment in tools to involve every Falls Church household and business, the entire community will contribute to, and in essence BE, the value of the city-wide demonstration model planned to be implemented during the next three years

Energy Smart District

The City will work closely with the State Corporation Commission (SCC) and Dominion Virginia Power to designate the City as an **Energy Smart District**. The new designation will remove traditional barriers for implementing readily available advanced renewable and alternative fuel technologies that are not currently being widely implemented due to financial and policy-based impediments. The Energy Smart District would:

- Not be bound by the current net metering limit of 1% of the state's total power consumption
- Be paid market rate for all energy sold back to the electric grid
- Foster investment in renewable energy and alternative fuel technologies by businesses and residents
- Result in the research and implementation of innovative renewable energy and alternative fuel technologies across the City of Falls Church

Energy Independence Day

The City Council unanimously approved the designation of July 4th as Energy Independence Day on X date. On July 4, 2009, we will launch the Energy Independence Day program; give away over 5,000 CFLs, and issue a Challenge to the citizens and businesses to join in our efforts to be zero-net energy by 2050.

By July 4, 2010 we will have adopted our energy management plan, established a non-profit program sponsor (see below for details regarding the public-private partnership), and begun the installation of thousands of Smart Meters. We will launch an energy benchmarking competition to the business owners and residents to reduce energy consumption intensity by 10% over 3 years. And, we will begin providing subsidized energy audits and low-interest loans to our citizens for capital expenditures to improve energy performance.

By July 4, 2011 (the last year we will be utilizing the US DOE ARRA funding) we will demonstrate progress toward our zero-net goal and have installed the renewable energy technologies and alternative transportation projects detailed below. We will be well underway with a sustainable, replicable business model to continue to leverage public-private partnership. We will also accelerate our energy reduction initiatives by establishing related programs to reduce energy usage and greenhouse gas emissions in the areas of municipal purchasing, the establishment of new, environmentally-friendly transportation alternatives, the encouragement of green building technologies, and the design and implementation on K-12 and adult education programs on energy efficiency, home and workplace renovation, and sustainable living.

City of Falls Church Energy Alliance- Public-Private Partnership

The City of Falls Church will form a public-private partnership, the City of Falls Church Energy Alliance, to leverage the resources of the private sector in order to achieve the overarching goal of the City of Falls Church being a zero-net energy community by 2050.

The City Falls Church Energy Alliance will be a non-profit organization, exempt from taxation, with board representation by the City Council, City Staff, Falls Church City Chamber of Commerce, key Alliance Partners, local businesses, and citizen stakeholder groups.

The Energy Alliance will oversee and administer the programs outlined below in renewable energy, energy efficiency, Smart Meters, advanced alternative energy technologies, and advanced transportation technologies and infrastructure. The Alliance will be responsible for all aspects of program implementation including DOE reporting, budget management, tracking of performance

metrics, City coordination, public outreach, selection of contractors, project oversight, and program development and expansion.

Organizational Structure

City of Falls Church

The City of Falls Church is the grant applicant and will be the recipient of the grant funds. These grant funds will be used by the City exclusively for the purposes outlined in the grant application. Funds will be disbursed by the City to project participants upon payment requests by the City of Falls Church Energy Alliance Executive Director, accompanied by supporting backup documentation.

The City staff funded by the grant are:

- 1 FTE Grant Administrator
- 1 FTE Program Specialist
- 1 FTE Energy Conservation Manager
- 1 FTE Administrative Specialist

City of Falls Church Energy Alliance Public-Private Partnership

The City of Falls Church Energy Alliance will be a 501c3 non-profit Limited Liability Corporation.

The Alliance will have a Board of Directors. Members of the Board will include:

- City Council Member (Board Chair)
- City Manager
- City Director Environmental Services
- City Economic Development Authority
- Alliance Executive Director
- City of Falls Church Chamber of Commerce
- Falls Church Housing Corporation (Community Stakeholder - Affordable Housing)
- Environmental Services Council (Community stakeholder group)
- Village Preservation and Improvement Society (Community stakeholder group)
- Home Owner Association Representative (Community stakeholder group)

Board decisions requiring a vote will require a majority.

The Board will also have a Board Steering Committee that will work closely with the Alliance Executive Director regarding strategy and reporting compliance. The Steering Committee will consist of:

- City Council Member (Board Chair)
- City Manager
- Alliance Executive Director
- City of Falls Church Chamber of Commerce
- Falls Church Housing Corporation (Community Stakeholder - Affordable Housing)
- Home Owner Association Representative (Community stakeholder group)

Board Steering decisions requiring a vote will require a majority.

The Alliance staff will consist of:

- Executive Director
- Deputy Director
- Energy Efficiency and Retrofit Specialist
- Community Outreach Specialist
- Finance and Administration Specialist

Program Sustainability

The City of Falls Church Energy Alliance will develop a business plan that will ensure the sustainability of the Alliance after the three year grant period and enable it to achieve its mission of the City of Falls Church becoming a net-zero energy city by 2050. Projected revenue streams include:

- Annual Associate Sponsorships by Corporate, Academic, Non-governmental organizations to the Alliance Public-Private Partnership
- Annual Sponsorship by real estate company that houses the Falls Church NetZero Energy Technology Center
- Private Foundations
- Outreach fees from the Falls Church Net Zero Energy Technology Incubator
- Royalties from technology developed by companies at the Falls Church Net Zero Energy Technology Incubator
- Outreach and Management Service fees from the Green Workforce Training Center
- Outreach fees from corporations participating in Falls Church Net Zero Energy Technology Center Outreach Missions to other communities
- Consulting fees from other municipalities wishing to accelerate the adoption of the Falls Church Net Zero Energy Technology model

Revenue streams in years 1-3 will be used to build up the organization's cash reserves. It is projected that by the end of year 3, monthly revenue will cover the operations expenses of the Alliance, as well as flow back funds to the City to cover related City staff costs. An eventual goal is to cover these expenses plus flow back a portion of excess revenues over expenses to the City to help pay for other City environmental projects.

City of Falls Church Energy Alliance Outreach

The City of Falls Church Energy Alliance will design and implement an outreach program, energizing and engaging Falls Church citizens and businesses to participate in sustainability and energy conservation measures, undertake green living practices, harness renewable energy sources in their homes and businesses, and support alternative fuel transportation system in the City. The outreach campaign will begin by developing a comprehensive plan, featuring initial identification of key barriers of adoption and a stakeholder matrix. Participants in an initial stakeholder meeting will work together to develop an initial concept model of key issues, including branding, with the assistance of a Falls Church design firm. A survey of a sample of the City population will gather information on people and businesses knowledge and attitudes towards energy conservation, renewable energy, green living, and other components of the Energy Alliance's programs. A second stakeholder meeting will revise the concept model, with

participants helping to identify outreach campaign objectives. SMART (Specific, Measurable, Action-oriented, Realistic, and Time-bound) objectives will be outlined and incorporated into the Energy Alliance outreach plan. A 3-year outreach campaign will be launched, featuring a number of activities, including school visits, programs at K-12 schools, presentations to the PTA, Chamber of Commerce and other City stakeholder groups, a booth at the Saturday Farmer's Market, posters, mailings, public access TV programming, and special events at an annual City of Falls Church Energy Independence Day celebration. Awards will be presented at the Energy Independence Day celebration each year. The Energy Alliance will also launch an Energy Alliance website and enlist local and other media to inform citizens, promote participation in Energy Alliance programs, and disseminate best practices.

The goal of the Energy Alliance is to have 30% participation in Energy Alliance programs in three years, 50% participation in five years, and participation increasing by 10% a year, to close to 100% participation in 10 years.

Replication

The Energy Alliance will also be the Secretariat for a separately branded Web 2.0 social networking site where citizens and businesses of Falls Church can form Energy teams of 3-5 households and businesses, working closely with team members to support the efforts of each other, and compete with other teams in the City. Individuals and teams will be able to document, quantify, and aggregate reductions in energy consumption and greenhouse gases, and share experiences and best practices. During Year 2, this social network site will be open to other communities for participation, creating a catalytic network of action for communities, sharing of best practices, and replicating successful practices on a community level across the U.S. This grant will fund the design, development and operation of the networking site for three years, with the site being "spun off" as a separate non-profit corporation, with long term funding coming from foundations and sponsorship by energy conservation service companies, renewable energy manufacturers/value added resellers, and other businesses.

Programs

1. Strategic Energy Management Policy, Program Design, and Implementation Plan

In conjunction with input and direction from the Board of Directors, technical experts, and City Staff, the Energy Alliance will develop a master energy management plan for the City to meet its ambitious goal of zero-net energy by 2050. One of the first tasks for this initiative will be to develop a policy for sustainability across the City's facilities, and strategies to meet the objectives of the policy. The establishment of a sustainability policy is critical to the success of a long-term, sustainable initiative for several reasons. It will demonstrate the City's commitment to employees, residents, businesses, stakeholders, and vendors and service providers; serve as the foundation for goals, objectives, and supporting tactics; and allow for smooth and more cost-effective implementation of sustainability efforts. The policy will include City objectives in creating a sustainability program, as well as the strategies that will be carried out to achieve those objectives.

Some of the objectives that the policy will address include:

- Recommend low-cost and no-cost measures to improve energy efficiency, reduce water consumption, and decrease the production of solid waste thereby reducing our overall energy loads
- Integrate green energy technology and quantifying benefits
- Establish green policies and programs for municipal procurement
- Evaluate technology, monitor results, and share data broadly with the explicit purpose of aiding the City to select future technologies to invest in that will help us achieve our zero-net energy goal
- Create new, sustainable, living wage green collar jobs
- Develop a sustainable business model with the City of Falls Church Energy Alliance to replicate and disseminate to other municipalities, including the establishment of a website which will track lessons learned and best practices and promote data-sharing.

Once a policy is developed and approved and goals are established, the Energy Alliance will assist the City in developing an implementation plan that addresses goals, timeframes, and metrics, and assigns accountability for implementing the sustainability initiatives. The implementation plan will define the path PREI will take to achieve sustainability goals – both short-term and long-term. The creation of the implementation plan will be guided by the sustainability policy. It will include definitive tasks that will contribute to a successful sustainability initiative.

2. Advanced Renewable Energy Portfolio

One of the first steps to achieve our ambitious goal of zero-net energy by 2050 is to produce a substantial amount of our energy needs locally – this is also being referred to as Community Energy. Our aim is to employ cost-effective, readily available renewable technologies that have traditionally been cost-prohibitive in Virginia due to a lack of financial incentives. We will install high efficiency photovoltaic, vertical-axis wind turbine, and geothermal technologies in the City’s Energy Smart District at both public and private, residential and commercial facilities and enhance building envelope efficiency. Project locations will be assessed based on existing site design criteria, tangible value to the city, visibility, and market impact potential. As a next step, the City will develop partnerships and possible bulk-purchase programs with US-based manufacturers and local contractors for the design, procurement, and installation of high efficiency renewable energy technologies.

Renewable Energy for Government Buildings

Design and install multiple roof-mounted high efficiency photovoltaic arrays and vertical-axis wind turbines on government buildings. All solar panels will have an efficiency of $\geq 17\%$. Vertical-axis wind turbines have been designed to be 20% more energy efficient than traditional horizontal-axis turbines.

Geothermal for Affordable Housing

Design and install geothermal heating and cooling systems at an affordable housing project in the City. Demonstrate the financial and environmental value of geothermal systems to City residents.

Renewable Energy for Residents and Businesses

A portion of the Renewable Energy and Energy Efficiency Fund will be used to finance renewable energy projects for residents and businesses. A detailed description of the program's funding strategy can be found in the "Financing Program" section below.

Benefits

- Reduce carbon footprint
- Reduce dependence on foreign oil
- Provide an estimated 500,000 kWh of clean renewable energy and 300,000 kWh of heating and cooling energy savings annually
- Provide a living learning lab for students of George Mason High School and Virginia Tech, professional education, industry research, job training, and awareness
- Create green collar jobs

Goals

- Connect photovoltaic and wind installations to the grid via Dominion Virginia Power's net metering service
- Develop renewable energy educational program for students to include comprehensive performance testing and monitoring program
- Educate City residents and businesses on high efficiency photovoltaic technologies, vertical axis wind turbines, and geothermal technologies
- Purchase renewable energy equipment from American manufacturers
- Develop revolving loan funds for businesses and residents to install renewable energy technologies

Metrics/ Outcomes

- Install the largest photovoltaic and vertical-axis wind turbine installations in the Commonwealth of Virginia
- Provide an estimated 500,000 kWh of clean renewable energy and 300,000 kWh of heating and cooling energy savings annually Track and share all energy performance data to encourage the use of high efficiency renewable energy technologies with City occupants, academic and other interested groups
- Provide all performance data to American manufacturers to further develop and increase the efficiency of photovoltaic technologies, vertical-axis wind turbine, and geothermal systems
- Educate and build awareness of the costs and benefits of renewable energy with students and community citizens, legislators, and other stakeholders
- Post all performance data on the Alliance website to enable the George Mason High School , local colleges and various stakeholders to perform continued research and analysis

3. Best Practices in Energy and Water Efficiency

Public Sector Program

The City will ensure that we have upgraded and implemented best practices in green building within our City-owned facilities as a demonstration and example for our citizens to follow. We will implement multiple energy and water conservation strategies in the public sector addressing building energy performance, water distribution, waste management, and energy efficient traffic lighting. Adopt an energy management policy to reduce the City's annual energy consumption of x MW (Brenda C. collecting DVP data on total usage) by 10% over the next three years. To this end, the City of Falls Church will adopt energy and water management policies with the following objectives:

- To reduce the City's annual energy consumption of x MW (Brenda C. collecting DVP data on total usage) by 10% over the next three years.
- To reduce water usage in City-owned facilities by 30% over the next three years.

Building Energy Benchmarking

The City currently owns and operates x public facilities, a total of x square feet. In 2008, these facilities consumed a total of x kWhs, costing x dollars, and representing x percentage of the City's operating budget. The City will benchmark the energy consumption of all public facilities and track progress towards the 20% energy reduction goal using EPA's ENERGY STAR program and other energy management resources provided by the EPA and DOE. Interns from local community colleges will assist in the collection of facility energy and water data to establish an accurate baseline in EPA's ENERGY STAR Portfolio Manager. A master account will be created in Portfolio Manager that will allow the city to track progress and verify energy savings. To streamline the data collection process, the City is in the process of developing a strategic partnership with Dominion Virginia Power and Washington Gas. Local energy consultants will assist facility managers in the development of cost-effective energy reduction strategies focused on no- and low-cost improvements.

The City's energy benchmarking program will serve as prototype for the commercial sector, demonstrating the City's commitment to environmental sustainability.

Water Conservation and Distribution

Working with Falls Church Water Authority, the city will baseline water consumption within its facilities and will implement water savings programs such as low-flow toilets, faucets and showers; waterless urinals; drip-irrigation of planted areas, and rainwater harvesting. Feasibility and funding sources for the introduction of graywater and possibly blackwater recycling systems will be explored.

Research and explore advanced technologies to reduce the energy consumption of the City's water distribution system. Potential technologies and strategies to reduce the distribution system's xMW annual energy load include high efficiency VFD water pumps, Rentricity (clean energy generated from piping pressure gradients), and water conservation education programs.

Energy Efficient Traffic Lighting

Retrofit 27 existing HID traffic lights to LED fixtures. Operating around the clock, the City's HID(?) traffic lights consume an estimated x kWhs of energy annually. The installation of LED fixtures will reduce energy consumption by x kWhs annually, saving the City x dollars per year.

Residential Program

Energy Audits

The City has coordinated with Dominion Virginia Power (DVP) to provide subsidized home energy audits. Pricing for the energy audits is as follows:

- Basic Home Energy Audit - \$35* (valued at \$150)
 - Advanced Home Energy Audit - \$100 (valued at \$250)
- *Fee waived for qualifying low-income households.

A Basic Home Energy Audit will provide an inspection of the home to help improve energy efficiency and comfort. It will include the following:

- Analysis of home's historical electrical usage
- Short interview with homeowner
- Moisture assessment (measure relative humidity, check mold/mildew, identify causes of moisture)
- Blower door test (measure air infiltration, air leaks)
- Inspection of building shell (attic, sidewalls, basement)
- Safety inspection of mechanical systems (CO and draft testing)
- Ventilation system assessment (inspect, measure ventilation)
- Detailed report addressing areas of concern; estimated energy savings, cost and payback period; and recommendations for improvements

An Advanced Home Energy Audit includes the services above and also:

- Infrared camera inspection to identify heat loss and air infiltration through windows, doors, walls, attic
- CD containing digital and infrared photos

City residents will submit a completed application request to DVP. A certified RESNET provider will perform the inspection and provide a HERS rating for each dwelling.

Following completion of the Energy Audit, households would have the option of participating in a Residential Energy Retrofit Program, which would finance weatherization and energy retrofit to produce locally-specified levels of energy savings.

Water Consumption Audits

Working with the Falls Church Water Authority, residents would review water and sewer bills for the past 12 months, and receive recommendations for low-flow toilets, showerheads, faucets, rainbarrels/rooftop cisterns (?) to reduce household water usage.

Commercial Program

The City’s energy and water efficiency program for non-municipal commercial buildings will be based upon the ENERGY STAR Program and will utilize the strategic guidelines to energy management and tools and resources currently provided by EPA and DOE.

The City will adopt an energy management policy with the goal to reduce energy intensity by 20% over the next three years. A sample energy management plan will be available for use by businesses committed to reduce their energy consumption as well.

The City will launch a benchmarking competition to all businesses to benchmark and set a baseline for energy performance and water usage by October 1, 2009. The City will provide three interns from the local community colleges to assist organizations to collect and input data into EPA’s ENERGY STAR Portfolio Manager. Additionally, the City is developing a strategic partnership with Dominion Virginia Power and Washington Gas to aid in providing energy and water data necessary to establish an accurate baseline. A master account will be created that allows the City to track and monitor progress, and verify resulting savings. A ceremony and recognition will be provided to in the following categories: most energy efficient, most water efficient, most improved, and greatest pollution prevented. The City will leverage the highly successful Kilowatt Crackdown competition already implemented in Seattle, WA as the model.



Once organizations understand how they currently perform and set targets for reduction, they can leverage no- and low-cost measures to reduce energy and water consumption in their facilities. A checklist of best practices will be provided to assist in reducing energy loads to optimum levels prior to capital expenditures being implemented. Dominion Virginia Power will assist in providing incentives and rebates for upgrading commercial HVAC systems to be more energy efficient, and the Falls Church Water Authority will provide similar assistance with respect to water efficiency goals. The City will also have a revolving loan fund available for no-interest capital improvements to improve energy and water efficiency.

Building and Zoning Code Development and Implementation

The City has already embarked on an aggressive program to embrace resource conscious planning and development and infuse urban recovery for a prosperous, livable suburb. The City is currently in the process of updating and revising its entire zoning code along with a review of the various approval processes. A major focus of these revisions and reviews will be to incorporate requirements and rewards for energy efficient construction and renovation in both residential and commercial buildings in the City, to include expedited planning and permitting for retrofits and for rooftop installations of PVAs and turbines. Thus, this task would include surveying best practices in the region and around the country with respect to these areas and then engaging all of the stakeholders to determine what methods would best be used to achieve the desired goals.

Along with major revisions of its building and zoning codes, the City will be reviewing and revising, as required, all of its processes with respect to both residential and commercial construction. This will include those processes related to, but not limited to, rezoning, special exceptions, site plans, building permits, and inspections. Most importantly, the City will determine what impact such incentives would have in achieving our overall goals in reducing energy and water uses and encouraging sustainable practices.

Benefits

- Reduce the carbon footprint (and associated greenhouse gases) of the City's public, commercial, and residential sectors
- Improve air quality for the City and surrounding areas
- Reduce the peak demand and assist in alleviating capacity issues faced by Dominion Virginia Power
- Reduction of water usage and water treatment through use of more efficient systems, use of rainwater for irrigation, drip irrigation, and use of native plants

- Improve thermal comfort of building occupants
- Extend the equipment life of HVAC systems
- Build awareness and educate residents of the financial, environmental, and social benefits of improved energy efficiency

Goals

- Reduce the aggregate energy consumption of the City and its inhabitants by 20% within three years (need to calculate based on DVP's #'s of current usage)
- Adopt and promote successful load curtailment programs to businesses and residents to reduce peak demand by X (based on DVP data to be provided)
- Reduce city-wide solid waste generation
- Assist Dominion Virginia Power in testing and implementing a fully functional automated benchmarking system that automatically uploads customers energy consumption into EPA's Portfolio Manager tool

Metrics/Outcomes

- Through a strategic alliance with Dominion Virginia Power, subsidized energy/sustainability audits for residential customers and potential administration of a home energy audit program
- Rebates and incentives for capital improvements in energy efficiency upgrades (i.e., energy audits for commercial buildings; building tune-ups; more energy efficient lighting upgrades; energy efficiency upgrade recommendations for motors, fans and pumps; financial analysis of opportunities; improved HVAC efficiency; energy modeling/simulations; infrared studies; pressurization measures; LED street lights and traffic signals)

4. Smart Meters

Another component of the City's **Energy Smart District** will be the installation of approximately 5,500 smart meters with two-way communication, replacing 100% of the City's existing electric meters. Through the strategic partnership with Dominion Virginia Power, the City will be the first jurisdiction to allow its residents and businesses to track energy consumption in real-time, fostering education and awareness of user decisions and their impact on the consumption and cost of energy. Smart meters will be the foundation for smart grid infrastructure, encouraging greater energy awareness and conservation measures.

Benefits

- Allow residents, businesses, municipalities, and schools to track energy consumption in real-time
- Deliver more efficient operating voltages to homes and businesses
- Increase awareness of energy consumption and cost leading to deeper conservation measures and lasting changes in behaviors
- Increase green collar jobs for the service technicians and installers of the smart meters
- Provide detailed data in a short timeframe to inform Dominion Virginia Power's pilot initiatives

Goals

- Develop business plan with associated costs, financial incentives, and timeframe for program implementation in 1Q 2010
- Collaborate with Dominion Virginia Power to identify a process and schedule to install over 5,000 smart meters by 2Q 2010
- Baseline energy consumption of homes and businesses before and after installation of smart meters and share results and findings with Dominion Virginia Power
- All smart meters will be purchased from American manufacturers
- Dominion Virginia Power and/or local contractors to be trained and to install smart meters
- Provide a learning lab for local vocational students
- Provide education and training to City residents and businesses on understanding and interpreting real-time meter information and the impact of changing behaviors such as raising set points, programming thermostats to setback temperatures by 5 degrees or more...

- Enable Dominion Virginia Power to accurately identify locations during power outages in order to restore service more quickly

Metrics/ Outcomes

- Provide real-time energy metering capabilities to homeowners and businesses
- Make all program data and results publicly available to encourage widespread implementation of smart meter programs in other municipalities
- Educate and build awareness for citizens other stakeholders – post data and research to the Energy Alliance website to proactively share with academics and other interested parties

5. Advanced Alternative Energy Technologies

Wastewater to Hydrogen Bioreactor: Serve as a catalyst to develop a multi-jurisdictional wastewater treatment facility partnership with the City of Falls Church, Arlington County, and the City of Alexandria for the design and installation of a hydrogen bioreactor at a local wastewater treatment facility. Utilize the bioreactor’s hydrogen and methane off gases to power City-owned hydrogen vehicles and install an on-site hydrogen refueling station. Through an active collaboration with the U.S. DOE and industry experts, further develop commercially viable wastewater to hydrogen technology and better understand the potential use of this technology to address the region and country’s need for long-term water and energy solutions.

Benefits

- Reduce wastewater substrate by 70% and the associated transportation of substrate costs
- Reduce burning of fossil fuels, reduce greenhouse gas emissions and thereby reduce our regional carbon footprint
- Transfer new innovative hydrogen production technology into commercially viable applications
- Develop local hydrogen fuel source for City vehicles
- Provide a living learning lab for research, job training, education and awareness
- Create local jobs with high-value industries

Goals

- Research, design, and install hydrogen bioreactors at the Alexandria and Arlington wastewater treatment plants.
- Develop business plan with associated cost, timeframe, and research scope for implementation in 1Q 2010
- Capture and use waste bio-gas to power City vehicles
- Install a hydrogen refueling station at wastewater treatment facility
- Where feasible, purchase hydrogen bioreactor equipment from American manufacturers

Metrics/ Outcomes

- Contribute to the development of a commercially viable hydrogen bioreactor

- Technology transfer to other municipalities and commercial applications
- Provide a learning lab for students of George Mason High School and Virginia Tech
- Education and awareness for citizens of the City and surrounding area (legislators, etc) – develop a website where all data is housed, shared, and communicated to various stakeholders
- Provide all data and research findings to regulatory and academic community to further develop, finance, and enhance hydrogen bioreactor technology
- Collect performance data for other localities and operators for benchmarking

Hydrogen Fuel Cells and CHP for Buildings: Install a 200 kW natural gas-powered, hydrogen fuel cell at existing City facility and utilize combined heat power (CHP) technologies to offset facility heating and cooling loads. The City will develop partnerships with US-based manufacturers and local contractors for the design, procurement, and installation of hydrogen fuel cell and CHP technologies.

Benefits

- Reduce carbon footprint
- Reduce dependence on foreign oil
- Provide a total 200 kW of energy
- Provide a living learning lab for students of George Mason High School and Virginia Tech, and University of Virginia, professional education, industry research, job training, and awareness
- Create living wage, sustainable green collar jobs

Goals

- Develop fuel cell and CHP educational program for local students to include comprehensive performance testing and monitoring program
- Educate City residents and businesses on fuel cell and CHP technologies for buildings
- Purchase fuel cells from American manufacturers
- Contract with local fuel cell contractor(s) for system installation
- Create revolving loan fund for businesses and residents to install fuel cells

Metrics/ Outcomes

- Make all energy performance data publicly available to encourage the use of fuel cells for buildings
- Provide all performance data to American manufacturers to further develop and increase the efficiency of fuel cell technologies
- Education and awareness for students and community citizens (legislators, etc) – George Mason High School and/or Virginia Tech to develop a website where all data is housed, shared, and communicated to various stakeholders

6. Advanced Transportation Technologies and Infrastructure

Approximately X percent of the City commuters use public transportation. Two metro stops serving the greater DC metro region are located within walking distance to the City's downtown district and most residences. Expanding upon the City's long-standing sustainable transit-oriented philosophy, employ alternative-fueled city vehicles and continue to promote zero-car use for local travel.

Alternative Fuel Transportation Technologies: Place into operation City-owned, hydrogen fuel cell/lithium-ion hybrid vehicles to be powered by the hydrogen bioreactor; 4 passenger vehicles and 2-22 passenger buses. Install publicly available hydrogen refueling station at local gas station, encouraging City residents to purchase hydrogen powered vehicles. Where feasible, utilize excess hydrogen capacity of bioreactor to supply refueling station. Collaborate with the Federal Transportation Association (FTA), George Mason High School, Virginia Tech students, and local automobile service stations to better understand the operations, costs, and training required to convert, service and maintain the alternative fuel technologies.

Promote Zero-Car Use for Local Travel: Develop and implement alternative transportation programs for city and school employees to promote zero-car use for commuters. Programs include the designation of downtown ZipCar parking spaces and commuter incentives for bicycle travel and public transportation, and the expansion of bus options powered on alternative fuels linking area metro sites with local business and retail districts and community gathering places. If successful, expand programs to community residents.

Benefits

- Reduce carbon footprint
- Reduce dependence on foreign oil
- Test new innovative alternative fuel transportation technologies
- Reduce the number of cars on the road by promoting the use of alternative forms of transportation
- Provide a living learning lab for research, job training, education and awareness

Goals

- Employ City-owned, hydrogen fuel cell/lithium-ion hybrid vehicles; 4passenger vehicles and 2-22 passenger buses
- Assess expansion opportunities for additional publicly available alternative fueling stations.
- Develop, implement, and expand alternative transportation programs and infrastructure.
- Purchase alternative fuel vehicles from American manufacturers
- Develop business plan with associated cost and timeframe for implementation in 1Q 2010.
- Educate city residents and businesses on the process, energy savings, and environmental impact of alternative fuel transportation technologies.

Metrics/ Outcomes

- Save \$X currently spent on City transportation

- Technology transfer to other municipalities and commercial applications
- Provide a learning lab for other municipalities and students of George Mason and Virginia Tech
- Education and awareness for citizens of the City and surrounding area (legislators, etc) – George Mason High School and/or Virginia Tech students to develop a website where all data is housed, shared, and communicated to various stakeholder.

7. Advanced Solid Waste Management Program: Pay-as-you-Throw

Expanding upon the City’s “pay-as-you-throw” program for yard waste, develop and implement a comprehensive PAYT program in which residents are charged for the collection of municipal solid waste based on the amount that they throw away. Compared to fixed-rate waste removal programs, PAYT is inherently fair due to the variable rate payment structure, incentivizes residents to reduce the amount of waste generated, encourages recycling, and is economically sustainable.

Benefits

- Encourage recycling via incentive- based waste management program
- Reduce waste deposited in landfill
- Reduce City’s environmental impact
- Provide a living learning lab for research, job training, education and awareness

Goals

- Implement economically and environmentally sustainable waste management program
- Develop business plan with associated cost and timeframe for implementation in 1Q 2010
- Educate city residents and businesses on environmentally responsible waste management
- Employ 65 gallon trash cars and retrofits for existing refuse trucks
- Place into operation 2 hydraulic hybrid refuse trucks
- Place into operation solar powered refuse containers for commercial buildings
- Expand recycling center to accept batteries
- Place into operation solar cardboard compactors
- Place into operation hybrid roll-off truck to transport cardboard
- Install and pilot in-vessel composting units at schools, government buildings, and grad center
- Place into operation portable grinder and chipper to reduce related transport costs
- Offer training/education regarding cost-effectiveness of recycling, contracting options, and best practices

Metrics/ Outcomes

- Save \$X currently spent on waste management
- Program transfer to other municipalities
- Provide a learning lab for other municipalities and students of George Mason and Virginia Tech

- Education and awareness for citizens of the City and surrounding area (legislators, etc) – George Mason High School and/or Virginia Tech students to develop a website where all data is housed, shared, and communicated to various stakeholder.

8. Workforce Education and Training

In March 2009, the San Francisco Bay and Greater Silicon Valley Centers of Excellence surveyed 700 employers in the 12 county San Francisco Bay Area in order to better understand the projected demand for energy efficiency occupations and the workforce needs of employers.

Eight energy efficiency occupations were projected to significantly increase in the Bay area:

Description	3-Year Projected growth in Jobs	Growth Rate
Project managers for construction or design work	2,850	27%
Building performance or retrofitting specialists	2,690	58%
HVAC Mechanics, technicians or installers	1,630	31%
Energy auditors or home energy raters	1,470	49%
Resource conservation or energy efficiency managers	1,400	45%
Building control system technicians	1,160	42%
Compliance analyst or energy regulation specialist	1,190	59%
Building operators/engineers	710	22%

The survey results also indicate that the majority of employers are having difficulty hiring qualified candidates in all eight energy efficiency occupations. Employers also expressed great interest in education programs that can be developed by community colleges, including student internships.

According to the March 19, 2009 Washington Area and Northern Virginia Economic Performance Outlook presentation by Dr. Stephen Fuller, a highly respected regional economist, the Washington D.C area has the strongest job market of the 15 largest job markets in the U.S., including the San Francisco Bay area. We believe that energy efficiency job growth in the Washington, D.C area will compare favorably with the San Francisco Bay area.

The Falls Church Net Zero Energy Technology Energy Workforce Training Program will work with a Virginia Community college to survey needs in the Washington, D.C. metro area and to facilitate the development of a Net Zero Energy Technology Energy Workforce Training Center in the City of Falls Church. Funds will be used to provide space for the center, hire adjunct professors who work in the field to design professional Certificate programs and develop course curriculum, and hire adjunct professors to teach the courses. Students will be offered internships to assist in the energy audits, energy efficiency retrofits, and renewable energy installations funded by this grant, providing students with real world opportunities to train.

In addition, the grant funds training related to the technology programs such as

Goals

- Facilitate the development of a Net Zero Energy Technology Energy Workforce Training Center in the City of Falls Church
- Conduct energy efficiency workforce survey among area employers
- Design professional Certificate programs
- Develop curriculum for courses
- Train 1,000 course-students
- Train 36 commercial building managers in commercial buildings receiving energy audits
- Provide inspections training for City staff
- Provide wastewater to hydrogen facility training to facility personnel
- Provide hydrogen vehicle maintenance training to facility personnel
- Facilitate the est web-based forum for data sharing regarding energy production
- Facilitate dissemination of information regarding best energy practices and technology applications within the community
 - Ex: web 2.0 social networking application
- Seek out co-operative programs with academic institutions to maximize value of data and experience for Falls Church and the broader world

Outcomes

- More highly skilled local workforce
- More informed training community
- More efficient use of resources by community
- Greater community-wide inclination towards sustainability

9. Financing Program

Energy Efficiency and Renewable Energy Fund

The City of Falls Church Energy Efficiency and Renewable Energy Fund will be available to businesses and residents of the City who have conducted an energy audit. The fund will be a revolving loan fund, providing a low interest loan component to a loan package that will include a loan from the Fund, as well as from an Alliance partner financial institution. The term of the loan will be 10 years.

The performance of the fund will be monitored by the Executive Director of the Alliance, with monthly activity reports being sent to the Board Steering Committee and quarterly reports sent to the Alliance Board of Directors. The Executive Director will work with the Alliance partner financial institution to review applications, and their recommendations will be forwarded to the Alliance Board Steering Committee for authorization. Administration of loan repayments will be conducted by the Alliance partner financial institution.

Leveraging the Private Sector

Public Sector Program Financing

The City of Falls Church will finance the public sector program under a number of vehicles. Priority energy efficiency retrofits will be financed through the program's grant fund. In addition, the City will explore the issuance of Build America bonds to finance performance contracting with energy service companies (ESCOs), and will explore partnerships with ESCO organizations such as Hannon Armstrong, Johnson Controls, Honeywell, Siemens, Carrier or Trane.

Residential Program Financing

Through the City of Falls Church Alliance, the City will explore and select financially viable financing options including, but not limited to revolving loan funds, City subsidizations and interest rate buydowns, and utility incentives and rebates. DOE funds would initially seed this fund and the city would augment or leverage fund capital through other sources (such as foundation funding, contributions from Dominion Virginia Power, other stimulus funding from Virginia, or hard debt as necessary, including private loans or the use of Build America Bonds).

Potential financing structures include the use of on-bill financing in order to extend loan terms to 20 years or more for participating properties. Under on-bill financing, the debt obligation is added to the owner's property tax or utility bill and "runs with the land", establishing a first lien that must be assumed upon sale to a new owner. An alternative approach is to utilize second mortgages and/or "wrap" mortgages to finance the efficiency improvements, with the second or "wrap" mortgage either assumable by the new purchaser or repaid at sale or refinance. In either case, the retrofit financing, including loan principal amount, term and monthly payments, would be structured on the basis of the household's ability to pay, the energy and water savings produced by retrofit, and the value of the

underlying property. To the fullest extent possible, the City would hope to develop a financing program in which monthly energy savings would exceed additional debt service, creating net savings for the homeowner. To assist lower- and moderate-income buyers, the City will consider program features to further reduce retrofit financing costs, including interest rate buy downs and retrofit grants.

The fund would be structured to grow over time, and would be modeled to generate sufficient interest accrual to cover administrative costs to the City, and costs to have third party financial institution to underwrite, originate, and service these loans. The Alliance expects to partner with an area financial institution (such as PNC Bank) a consortium of local lenders experienced in underwriting, originating, and servicing of home improvement loans, or a nonprofit entity experienced in such activities. The Alliance will explore the potential of migrating the administration and oversight of the Fund to a third-party active in residential retrofits if this is determined to be a cost-effective, appropriate transition to lower overhead costs and access to a larger pool of resources if necessary.

Future ventures for this fund could be retrofits linked to green certification, universal design retrofits, net zero energy use retrofits, etc. Because historic structures are frequently constructed to take advantage of passive heating and cooling technologies, the City will also encourage the use of its energy-efficient retrofit initiatives in conjunction with the preservation of historic residences.

Commercial Program Financing

The City will also develop programs to finance the retrofit of privately-owned commercial real estate. Through the City of Falls Church Alliance, the City will explore and select financially viable financing options including, but not limited to issuance of Build America bonds to establish revolving loan funds, City subsidizations and interest rate buydowns, the use of energy tax credits for building owners, and utility incentives and rebates. DOE funds would initially seed a revolving loan fund and the city would augment or leverage fund capital through other sources (such as foundation funding, contributions from Dominion Virginia Power, other stimulus funding from Virginia, or hard debt as necessary, including private loans or the use of Build America Bonds). Potential financing structures include the use of on-bill financing in order to extend loan terms to 20 years or more for participating properties. Under on-bill financing, the debt obligation is added to the owner's property tax or utility bill and "runs with the land", establishing a first lien that must be assumed upon sale to a new owner. An alternative approach is to utilize second mortgages and/or "wrap" mortgages to finance the efficiency improvements, with the second or "wrap" mortgage either assumable by the new purchaser or repaid at sale or refinance. In either case, the retrofit financing, including loan principal amount, term and monthly payments, would be structured on the basis of the property owner's cash flow, the energy and water savings produced by retrofit, and the value of the underlying property. To the fullest extent possible, the City would hope to develop a financing program in which monthly energy and water savings would exceed additional debt service, creating net savings for the property owner. To assist non-profit owned or other public benefit properties, the City will consider program features to further reduce retrofit financing costs, including interest rate buydowns and retrofit grants.

The fund would be structured to generate sufficient interest accruals to grow over time and to cover administrative fees incurred by third party financial institutions, In administering the program, the Alliance expects to partner with an area financial institution (such as PNC Bank), or a consortium of local lenders experienced in underwriting, originating, and servicing of commercial real estate

A third option available to finance commercial real estate retrofit programs are ESCO programs, or an ESCO variant, a Managed Energy Service Agreement (MESA) program. Potential ESCO partners include Hannon Armstrong, Johnson Controls, Honeywell, Siemens, Carrier, and Trane. Transcend Equity has pioneered the use of MESA structures for green and energy efficient commercial retrofit programs and the Alliance will explore and learn from others' to determine a cost-effective, functional model for the City.

Future ventures for this fund could be retrofits linked to green certification, universal design retrofits, net zero energy use retrofits, etc. Because historic structures are frequently constructed to take advantage of passive heating and cooling technologies, the City will also encourage the use of its energy-efficient retrofit initiatives in conjunction with the preservation of historic buildings for commercial use.

Pilot Projects for Innovative Technologies

The City will also undertake selective, project-based pilot initiatives to explore the introduction of innovative technologies in the development and retrofit of energy-efficiency and zero net energy buildings. Technologies that will be explored will include passive heating and cooling, the testing of advanced materials, and the development or retrofit of buildings to meet zero net energy standards. This project will be financed with DOE funds and will be conducted in partnership with leading building science organizations, such as those established at the Virginia Institute of Technology, the National Renewable Energy Laboratory and Lawrence Berkeley National Laboratory.

Job Creation

Through the implementation of this program, we anticipate the creation of 271 job years in the City of Falls Church and surrounding area economies. This estimate was based on the President's Council of Economic calculation method of \$92,136 per job year.

Performance Period

It is intended that the initiative described above will all be initiated within 18 months of the award date and fully implemented within 3 years of the award date.

Accountability

Project monitoring and evaluation will be provided by the project team, including the Energy Alliance public-private partnership staff and City staff in accordance with U.S. federal grant-making guidelines.

The project will be periodically reviewed to determine the status of all objectives and to make adjustments as necessary. Assessments tracking milestones and evaluation data will be reported quarterly. The Project Steering Committee of the Board of Directors of the Alliance will play a key role in the monitoring and evaluation of the Project to ensure it remains on track and responsive to all requirements of DOE grant makers and other funders.

Quarterly monitoring will be conducted by the Alliance and City staff, circulating among project management and staff, and sent to the Steering Committee. Targeted reports outlining key updates in Project progress will be provided as required by DOE grant guidelines.

At the end of the first year, Project staff and Steering Committee members will conduct a 12-month progress review. The results of the first year report will be signed off by the Alliance Board of Directors before being reported to DOE. A final full evaluation will be conducted at the end of the 3 year (or earlier) grant funding for the Project. A specific Project Monitoring & Evaluation (M&E) methodology and plan will be developed early in the first year of the project.

The plan for conducting the quarterly, annual and final reports will be prepared by Alliance and City staff based on appropriate process and outcome evaluation techniques. The plan will include, at minimum, descriptions of the following: 1) coordination and support between the Alliance and the City; 2) procedures for collecting data and reporting data on project performance; 3) schedule for the planned reviews; 4) how project participants will be involved in the evaluation; and 5) how monitoring and evaluation results will be used in project management and other purposes.

Annual audited financial statements will be filed in accordance with all U.S. federal grant requirements. Internal controls audits will be conducted according to industry standards. Auditor controls recommendations will be forwarded to the Alliance Board for immediate action.

Transparency and Stakeholder Engagement

Transparency will be ensured by the participation of key community stakeholder groups on the Board of Directors of Energy Alliance and on the Alliance Board Steering committee. In addition, Alliance procurement summary reports will be posted quarterly on the Alliance web site.

Community stakeholders will be engaged throughout the three years of the project and beyond, throughout the life of the Alliance public-private partnership. Key community stakeholder organizations will be included on the Alliance Board of Directors. Early in the project, a community stakeholder meeting will be held to explain the goals of the project and to answer questions. Televised community stakeholder meetings will be held 4 times a year, after each quarterly report is issued. Quarterly reports, minutes from quarterly community stakeholder meetings, and answers to stakeholder questions will be posted on the Alliance web site. Each quarterly meeting will review progress on unanswered questions from the previous stakeholder meeting.

Program Budget

Falls Church Energy Alliance PPP

Personnel:

Executive Director	\$105,000	\$315,000
Deputy Director	\$75,000	\$225,000
Energy Efficiency & Retrofit Specialist	\$50,000	\$150,000
Community Outreach Specialist	\$50,000	\$150,000
Finance and Administration Specialist	\$50,000	\$150,000
Payroll taxes	\$49,500	\$148,500
Health Insurance	\$32,400	\$97,200
Total Personnel Costs	\$411,900	\$1,235,700

Office Expenses

Rent	\$52,500	\$157,500
Marketing Materials	\$5,000	\$15,000
Office Supplies	\$6,000	\$18,000
Business, Liability, D&O Insurance	\$6,000	\$18,000
Total Office Expenses	\$69,500	\$208,500

Telecommunications and Technology Expenses

Telecommunications	\$6,000	\$18,000
Furniture and computer equipment		\$16,000
Office supplies	\$2,400	\$16,000
CRM & Program Tracking Info System hosting	\$5,000	\$15,000
CRM & Program Tracking Info System Development		\$75,000
Network & Desktop Support	\$18,000	\$54,000
Total Telecommunications & Tech Expenses	\$31,400	\$194,000

Community and Industry Outreach

Community Outreach Workshops, Seminars & Materials	\$30,000	\$90,000
Regional Outreach Missions, Workshops, Seminars & Materials	\$20,000	\$60,000
Industry Outreach Events & Activities	\$15,000	\$45,000
Web Hosting	\$1,200	\$3,600
PPP Web Site Development & Maintenance	\$15,000	\$45,000
Community Engagement Social Network site	\$50,000	\$150,000
Total Community & Industry Outreach	\$131,200	\$393,600

Consultants:

PPP Outreach Planning (Year 1)		\$30,000
PPP Formation legal fees (Year 1)		\$20,000
Legal	\$10,000	\$30,000
Accounting	\$10,000	\$30,000
Code Development		\$100,000
Consultants Total	\$20,000	\$210,000

Total Falls Church Energy Alliance PPP	\$664,000	\$2,241,800
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Falls Church City Administrative Expenses

1 FTE Grant Administrator	\$70,000	\$210,000
1 FTE Program Specialist	\$60,000	\$180,000
1 FTE Energy Conservation Manager	\$70,000	\$210,000
1 FTE Administrative Specialist	\$50,000	\$150,000
Auditing	\$15,000	\$45,000
Liability, Fiduciary Insurance	\$2,000	\$6,000
Rent	\$22,500	\$67,500
Office supplies	\$2,400	\$7,200
Telecommunications	\$3,600	\$10,800
Furniture and computer equipment		\$7,500
Network & desktop Support	\$6,000	\$18,000
Total FCC Administrative Expenses	\$265,000	\$795,000

Program Expenses

Renewable Energy Portfolio

Renewable Energy for Government Buildings

Government Building Solar Power		\$2,000,000
Government Building Wind Power		\$400,000
Total Renewable Energy For Gov't Buildings		\$2,400,000

Renewable Energy for Affordable Housing

Geothermal		\$1,000,000
Total Renewable Energy Portfolio		\$3,400,000

Financial Incentives Program

Technical consulting		\$100,000
Energy Efficiency & Renewable Energy Fund		\$4,000,000
		\$4,100,000

Energy Efficiency Programs

Master Energy Efficiency Strategy Plan		\$50,000
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Government Building Energy Efficiency		\$500,000
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Energy Efficiency Retrofits

Residential Building Audits	\$250,000	\$750,000
Commercial Building Audits	\$420,000	\$1,260,000
Total Energy Efficiency Retrofits	\$670,000	\$2,010,000

Smart Grid Development

Smart Meters		\$1,750,000
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Smart Grid Management Infrastructure		<u>\$2,000,000</u>
Total Smart Grid Development		<u>\$3,750,000</u>
Total Energy Efficiency Programs		<u>\$6,310,000</u>
Material Conservation Program		
Pay as You Throw (PAYT) solid waste planning		\$100,000
Building Code and Zoning Development		
Consultants		\$100,000
Water Conservation		
Business and Residence Conservation Program		\$500,000
Advanced Transportation Technologies and Infrastructure		
Traffic Signals and Street Lighting		\$100,000
Wastewater to Hydrogen Program		\$1,208,000
Hydrogen Buses and Passenger Vehicle Fleet		<u>\$5,020,000</u>
Total Advanced Transportation Technologies		<u>\$6,328,000</u>
Energy Workforce Training Programs		
Energy Efficiency Workforce Training & Capacity Building	\$300,000	\$900,000
Commercial Building Facility Manager Training	\$30,000	\$90,000
Inspections Training for City Staff	\$12,000	\$36,000
Wastewater to Hydrogen Program Training		\$15,000
Hydrogen Fueling Station Training		\$10,000
City Hydrogen Fleet Vehicle Maintenance Training		<u>\$30,000</u>
Total Energy Workforce Training		<u>\$1,081,000</u>
Total Expenses		<u><u>\$24,955,800</u></u>