



## Financing Projects through Energy Savings and Sustainability

*(Critical Industry Issue)*

### Problem Background

The idea for this analysis comes from topics discussed at the Pace Roundtable Conference held at Penn State University on October 16, 2008. As the economy seems to be slipping into a recession, financing for new projects is becoming harder to obtain. Allocating the necessary funding to produce a new building is hard in good economic times, let alone bad ones. As the economy is turning, the focus begins to shift from what can be done with a new facility to how expenses can be saved on an existing facility. Renovations seem to become the project type of choice during these times, most commonly those that save energy to lower the cost of operating and maintaining the facility. There is no exception at Crystal Plaza II. As two of the analyses show, the primary focus is on saving through energy. Whether it be through onsite production or by shifting the peak demand to take advantage of the rate structure of the utility, saving energy has the opportunity to save large portions of expenses for owners. This concept is radically different when used to fully finance a project, a renovation, or a change in the materials to create energy savings. Not only does it offer the opportunity for savings, but it is also sustainable in many ways. Research into the areas of smart grids, rebates and incentives, reverse metering, carbon credits, demand shift, and demand response programs offer alternative means to acquire the necessary funding for these projects and in the current economic situation, my prove the key difference in contractors landing their next project.

### Problem Statement

This analysis will serve as research into a critical industry issue. That issue is the current availability of financing and funding for new or renovation projects (typical in times of economic stress) through the advantages of energy savings or sustainability. The use of these advantages is often overlooked in good economic times, however energy savings is the first topic to be addressed when the economy takes a downward turn. Proper investigation into incentives, rebates, carbon credits, demand shift, and demand response programs are necessary as well as the current ideas and thoughts held by industry members about these topics to research their feasibility in the Washington D.C. area.

### Goals

The goal for this analysis is to conduct an industry interview concerning the use of such programs described above in marketing potential projects to owners or to provide a competitive advantage in presenting an alternative way to finance a project or renovation that in turn can pay for itself. The goal is to provide the background necessary to support the two analyses ability to benefit the owner. Also, information for the owner in how to market these potential energy savings and take advantage of federal and state programs is a goal

### Research Procedure

1. Research programs available in the Arlington VA. area
2. Identify case studies of programs in the area
3. Prepare benefit report for current project if applicable and for analyses 1 and 2



## Tools and Resources

1. Building energy information
2. Local utility structure/rates
3. Energy rebate/incentive/demand program websites
4. Industry members

## Expected Outcome

This analysis will serve as the critical industry issue and is expected to show the current trend and thinking of industry members on the topic. With the current economic situation the outcome of the research should so a positive gain for both the owner and the contractors. The results provided will also help the current project, Crystal Plaza II, in applying for potential incentives and rebates. The results should also reinforce the use of the energy analyses as feasible alternatives or means of saving operating costs. It is expected that the benefit of using the federal rebates or demand response programs were applicable will be a substantial benefit to all parties.

## Programs

The research in this analysis primarily focuses on the programs shown available through the Database of State Incentives for Renewables & Efficiency (North Carolina State University, 2007). Using the site allows for an overview of potential programs applicable to the selected area as well as federal programs. While some of these programs are not applicable to Crystal Plaza II, they warrant discussion. Also, many of the programs are taxed based, and respecting the privacy of the owner, the tax information has not been released.

### Arlington County Green Building Incentive Program

The Green Building Incentive Program is a comprehensive, whole building approach developed by the County Board of Arlington in 1999 and fully implemented in 2000. This program uses the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) ratings. As incentives to accomplishing green goals and LEED standards, the county grants density and height bonuses to the facility. To be eligible for these bonuses the facility must reach LEED certification.(North Carolina State University, 2007)

The bonuses varying according the level of LEED recognition, from a potential 0.15 floor area ration (FAR) increase for certified judged on a case by case basis, to 0.25 FAR for LEED Silver, to 0.35 FAR increase for LEED Gold and Platinum.(North Carolina State University, 2007)

As part of the program a Green Building Fund was created. The policy for the fund states that developers that do not seek LEED certifications must contribute \$0.03 per square foot to the Green Building Fund which is used for education and programs aimed at developers.(North Carolina State University, 2007)

This program would be a good choice for Crystal Plaza II, even though its FAR is partially set due to the renovation project type. However, given the project is seeking LEED Silver, the contribution to the Green Building Fund can be eliminated. Also, the height limitation was released for the construction of



Crystal Plaza II, as it was limited to 12 stories or about 153 feet. This may have been a bonus given the LEED pursuit, but could also be through petitions to the local authority.

As for FAR consideration, Crystal Plaza II is zoned as a C-O with an FAR of 0.60(Arlington County, 2008). With the bonus applied the FAR could now be as high as 0.85, because of the LEED Silver certification sought by the developers.

### TVA Green Power Switch Generation Partners Program

This program is limited to power distributor within Tennessee Valley Authority’s service area. Unfortunately this is only applicable to areas in Southwestern Virginia. However, the program merits discussion. The program is an incentive partners program in which the owner partners with the utility. Participant’s green energy production from solar or wind is counted as part of TVA’s green pricing program offered to its customers, known as Green Power Switch.(North Carolina State University, 2007)

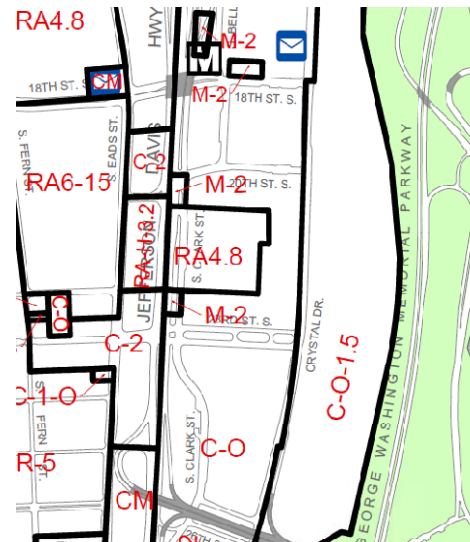


Figure 61 Zoning map for Crystal Plaza II located at 20th St S and Crystal Dr

For an application such as Crystal Plaza II, the category for the program would be commercial. The incentive is based upon production and transmission of kWh, with revenue of \$0.20/kWh on a 10 year contract. Using the south façade case for BIPV production, Crystal Plaza II could potentially market nearly 80,000 kWh per year equating to revenue of \$16,000. This is substantial in that by using the system to simply offset energy use, the BIPV could only save an average of \$4,000 per year. This program provides a quadruple effect on savings! This would allow the system simple payback to be reduced from 160 years to 47 years. With other incentives for capital investment and tax credits, this could drop payback even farther, making the system feasible.

It is suggested that the site management team at Crystal Plaza II negotiate with local utilities to determine if a similar system could be implemented in the Arlington area. Such a system would greatly benefit future projects considering green power generation by making the project more financing feasible. While the application at Crystal Plaza II is not possible given the current state of construction, the ability to recognize benefits in future projects is a great outcome of this analysis.

### Local Property Tax Assessment for Energy Efficient Buildings

This is another comprehensive, whole building program that allows local authorities to evaluate the property tax of energy efficient buildings at reduced rates. This allows for the building to be assessed at a lower rate than a non energy efficient building of the same type, however, the assessment of the property (land) is not affected. The program defines an energy efficient building as “any building that exceeds the energy efficiency standards of the Virginia Uniform Statewide Building Code by 20%, meets performance standards of the Green Globes Green Building Rating System, the Leadership in Energy and



Environmental Design System or the EarthCraft House program,...” meaning that by reaching a certification in the LEED system, Crystal Plaza II is qualified for the program if offered by Arlington County.(North Carolina State University, 2007) In researching availability with the provided email address to Arlington County, no response was given to the availability of such a program with tax information provided, which was withheld by the owner.

This program could benefit Crystal Plaza II in the assessment value of the property, and when tied with other tax deductions, could significantly lower the taxes on the facility.

**Local Option Property Tax Exemption for Solar**

The program is also not applicable to Crystal Plaza II, as Arlington County is not listed as a participating city or county. The program allows any county, city, or town to exempt, either fully or partially, the cost of the solar energy equipment from local property taxes. Solar energy equipment is defined by the program as any equipment “designed and used primarily for the purpose of providing for the collection and use of incident solar energy for water heating, space heating or cooling or other application which would otherwise require a conventional source of energy.”(North Carolina State University, 2007)

Using this program would allow the cost of the solar energy system to be deducted from the property taxed assessed value. Given the large cost of such a system, the lower assessment would be beneficial. While surrounding jurisdictions such as Alexandria, Fairfax, Falls Church, and Loudoun have implemented the program, Arlington has not.

**Energy Efficient Commercial Buildings Tax Deduction**

This tax deduction basis its incentives on comprehensive and whole building measures with a focus on energy reduction as compared to ASHRAE Standard 90.1. The program is available to new and existing buildings that have installed interior lighting, building façade/envelope, or heating/cooling/ventilation systems that reduce the energy cost by 50% when compared to the ASHRAE standard from 2001. The savings must be calculated using a qualified program. The deduction for such measures is \$1.80 per square foot. A lower deduction of \$0.60 per square foot is available in which an individual system, such as lighting, façade, or heating/cooling are on target to contribute to an overall savings of 50%. This deduction is for federal taxes, as it is a federal program.(North Carolina State University, 2007)

This deduction is a hard goal to reach. When compared to LEED scoring, a 50% savings would entitle the building to all 10 points offered in EA Credit 1: Optimize Energy Performance. At Crystal Plaza II, only the prerequisite of meeting ASHRAE 90.1 was met. However, if a system within the building could show that it meets the target for contribution towards a 50% goal, a deduction of \$0.60/square foot could be awarded. This is not likely as no system in the building is of that efficiency.

savings percentage for each point allocation is as follows.

New Buildings	Existing Building Renovations	Points
10.5%	3.5%	1
14%	7%	2
17.5%	10.5%	3
21%	14%	4
24.5%	17.5%	5
28%	21%	6
31.5%	24.5%	7
35%	28%	8
38.5%	31.5%	9
42%	35%	10

**Figure 62 Percent versus point breakdown from EA Credit 1, NC 2.2**



### **Modified Accelerated Cost Recovery System (MARCS)**

MARCS is another federally funded program that allows business to recover their investments in certain property enhancements, such as photovoltaics, through depreciation deductions on taxes. According to the class lives, from 3 to 50 years, established by the program into which the technology falls, the equipment can be depreciated. Much of the renewable energy equipment falls within a class allowing for 5 year depreciation. As a bonus, a 50% depreciation was enacted in February 2008 as part of the federal Economic Stimulus Act for equipment placed in service in 2008. (North Carolina State University, 2007)

Using this program, the investor can depreciate the value of the renewable energy equipment in a way to benefit their taxes. By depreciating the value of the equipment, the assessed value of the property goes down, thus benefiting the owner in the tax process.

### **Business Energy Investment Tax Credit (ITC)**

This is federally sponsored corporate tax credit that allows for credits of 30% for solar, fuel cells and small wind, and 10% for geothermal, microturbines, and combined heat and power. While some systems have a limitation on the size of the system, solar does not and it does not have an incentive limit. Also, the program was extended in 2008 by eight years. The program was further expanded by The American Recovery and Reinvestment Act of 2009, in which taxpayers eligible for the renewable electricity production tax credit (PTC) the ability to take the federal business energy investment tax credit or to receive a grant from the U.S. Treasury in place of the PTC. It also allows for substitution of a grant for the ITC. (North Carolina State University, 2007)

In terms of use at Crystal Plaza II, the tax deduction would greatly help the implementation of BIPV. With a system cost of over \$750,000, the program would allow a tax credit of about \$227,000 for a period of 8 years. If this were considered for the implementation of BIPV, the system payback period would decrease from 160 years to only 3.3 years at which time the tax credit would cease. This makes the BIPV system feasible and puts it in the acceptable payback period range for the developer.

### **U.S. Department of Treasury Renewable Energy Grants**

This program is an alternative option to the ITC that has been expanded by The American Recovery and Reinvestment Act of 2009. It allows the owner to choose which program to participate in. The grants area available to eligible property put in place during 2009 or 2010. For solar, the grant is valued at 30% of the basis of the property for solar energy. (North Carolina State University, 2007)

If this option were to be chosen based on the new property assessment value of \$68,807,300, a grant could be awarded in the approximate amount of \$20,000,000. However, given the cost of the system is much less, the grant would fully cover the cost of installation.

In either of the above programs, the payback for the BIPV system has become favorable and therefore is recommended as an alternative to be considered.



### **Dominion of Virginia Programs**

As part of a press release in June 2008, Dominion of Virginia outlined a plan to meet the 10% conservation goal enacted in 2007 by the Virginia General Assembly and the governor. The plan is part of a larger scheme titled "Powering Virginia" by which the company plans to meet the future needs of its customers. Described as a key component, installation of smart grid technologies will enhance the distribution system and allow for more efficient delivery of energy. Mentioned later in the article, Dominion plans to offer incentives for construction of energy efficient homes meeting Energy Star standards, commercial customers installing energy efficient lighting, programs that allow Dominion to cycle air conditioners and heat pumps during periods of peak demand (demand response), upgrades to more efficient heat pumps, and improvements to HVAC units in terms of efficiency. (Dominion of Virginia, 2008)

This program could allow for some financial gain at Crystal Plaza II, as the lighting and mechanical systems are highly efficient. With the use of Energy Star appliances, individual tenants could also benefit.

### **Summary**

Through the evaluation of these programs it can easily be seen the advantageous to sustainable and energy savings projects. The additional cost of the implementation is often overshadowed by the amount of incentives, rebates, or credits available for such technology. As an example the use of the federal tax credit (ITC) allowed for the analysis of the BIPV system to be feasible by lowering the payback period.

In discussions with the owner, using sustainable or energy savings features does create benefit in their eyes, however, as with most developers, price is the bottom line. With the available incentives provided above, much of the cost can be diverted, however, the necessary work to apply and monitor such programs brings with it cost.

Much of what this analysis was trying to accomplish was similar to the way performance contractors operate, in that systems are reconfigured or replaced with more efficient systems that generate maintenance and usage savings that in turn can pay for other capital improvements during and after the systems themselves are paid upon. While many of the tax credits and grants only cover the initial cost of the system or let it be omitted from the assessment, the value comes in the savings produced by lowering demand and producing electricity. The ability to eliminate the cost of the system and use its savings primarily as revenue for capital investment is something owners look for in projects.

If a contractor were able to provide the necessary service to participate in some of mentioned programs, a value engineering solution to add on-site renewable energy generation or other sustainable features could be considered rather than removed due to cost. As the market turns down, the ability to market these ideas as ways to lower the impact of the cost, both of the equipment and the overall building, can become a large selling point. Imagine telling an owner you can provide a PV system that not only lowers the energy bill, but creates revenue in net metering and can be obtained for next to no cost. Or of using an installed emergency generator to produce power during peak times that would



Christopher R. Stultz | Construction Management  
Dr. David Riley | Advisor

more than pay for the fuel and depreciation, allowing the excess to be implemented in a demand response program. Followed by the fact that not only do they save in energy costs because of lower demand, but they make money by participating in a program. Armed with this information, the contractor may very well be able to push not only sustainable or energy savings features onto the project, but to get the project rolling altogether.