

Spotsylvania Solar: A Stakeholder Analysis of Corporate Involvement

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Abstract: This report investigates the major corporations that hold a stake in sPower's 500-Megawatt Spotsylvania Solar Project through the framework of corporate social responsibility. The major corporations include the investors in the project, Microsoft, Apple in collaboration with Akamai, Etsy, and Swiss Re, and the University of Richmond, as well as the energy providers and distributors, Dominion Energy and PJM Interconnection. Through an evaluation of the investors' sustainability and environmental reports, the motivations behind their agreements with sPower can be attributed to a desire to meet their renewable energy goals. By purchasing a portion of the electricity generated by the solar installation, the investors are able to offset and match their fossil fuel electricity consumption.

Storymap: <https://urichmond.maps.arcgis.com/apps/MapJournal/index.html?appid=7a2dbc0ab3434abd9285d4e239d66d0f>

Introduction:

The major entities identified as the investors in the Spotsylvania Solar Project include Microsoft, Apple (in collaboration with Akamai, Etsy, and Swiss Re), and the University of Richmond. Each of these entities holds a significant stake in the execution of this project and have agreed to purchase portions of the energy that will be generated by the solar installation. In addition to these investors, two other organizations hold a substantial stake in the project as well, Dominion Energy and PJM Interconnection. Although these companies do not have any agreement to purchase the energy directly from sPower, they are affected by the solar installation and play a role in the transmission and generation of the electricity. The purpose of my research is to identify the stake that each of these entities possesses in this project as well as determine the motives behind their involvement.

Framework:

The stakeholder analysis framework is the basis of my project, establishing the process as well as the variables necessary to evaluate investors. At the most basic level, the stakeholder analysis theory as laid out by Freeman (1984) provides an outline for the necessary steps to take when analyzing the different parties involved (Laplume et al., 2008). Baker and Nofsinger (2012) present three different types of stakeholder theory in respect to financial entities: descriptive, normative, and instrumental. These are described as follows: “Normative stakeholder theory views a firm’s behavior through an idealistic social or moral lens...how the firms “should” act. Instrumental stakeholder theory views stakeholder relationships as the means to some end, such as maximizing firm value. By contrast, descriptive stakeholder theory uses the stakeholder model as a tool for describing the activities and interests of the firm” (Baker and Nofsinger, 2012). My research followed a descriptive stakeholder theory as I detailed the

interests of the firms and the potential motives for their involvement in this solar project as well as similar renewable energy projects.

A stakeholder analysis is typically most important for those spearheading the projects in order to comprehend how they must relate with and accommodate the various stakeholders. The stakeholder analysis framework prompts the analyst to classify the stakeholders often based on either their interest or their level of power (Brugha & Varvasovsky, 2000). After this distinction, the purpose of the analysis is to understand the role that this stakeholder plays in the entirety of the project, including the degree of their involvement, their motives, as well as the methods and strategies they employ. The analysis is beneficial for evaluating plans and policies to see how the parties involved will be affected and the possible actions that they will take as a result (Brugha & Varvasovsky, 2000). In a way, I have worked backwards with this theory because the agreements have already been made between the different entities, so I am not selecting those that I feel are appropriate to join with, but I am working to understand the relationships between sPower and the different corporations. In my case, the stakeholders all hold similar roles as the financial entities, so their level of power and interest could be relatively equal.

When investigating this theory, there have been instances of the implementation of a framework regarding corporate social responsibility as well as relationship theories (Andriof et al., 2017). Corporate social responsibility focuses on the effect that corporations have on society at large and alters the decisions they make as a result. An investigation of this theory presents the corporations that are investing in the solar project to possess an obligation to those affected by their operations, establishing even more stakeholders (Baker and Nofsinger, 2012). One of the main ways that businesses choose to address the environmental component of corporate social responsibility is through the reduction of their carbon footprint. This is typically done through

utilizing renewable energy as the main source for the business' energy consumption. These concepts are especially relevant to the investors of the solar project because of their sustainability and environmental plans.

When evaluating a business' corporate social responsibility initiatives that focus on an obligation to the natural environment, one must be aware of the concept of greenwashing. Businesses that claim to be sustainable or environmentally conscious are not always truthful and often provide only the positive aspects of their initiatives. Greenwashing is the act of providing an inaccurate representation of the business products and/or operations in order to appear more environmentally sound (Bowen & Aragon-Correa, 2014). Businesses use the tactic of greenwashing for public relations purposes in order to cater to an audience that engages with sustainable companies.

Methodology:

In order to conduct my research and understand the roles and motives of each of the stakeholders, I relied heavily on the framework of corporate social responsibility and evaluated the environmental policies and goals that they made available on their company websites. I also reviewed various news articles to find more information regarding the size of their investments and any information relevant to their agreements. These news articles were further utilized to understand how the purchased wattage would be utilized by each investor.

I created a map to illustrate the different aspects of my research, which I then embedded into a story map highlighting my findings on each investor, the link to which can be found on the cover page of this report. I chose to create a map because I believe that it best illustrates the points and connections that I am trying to make. The map contributes to the information I am conveying by providing a visual element to help the reader understand the involvement of the

different entities. My original map has many layers, but each tab of the story map displays the layers that are relevant to the content included. The layers of the map include portions of the solar project, data and retail centers, Dominion solar projects, Dominion substations, PJM zones, as well as Virginia transmission lines. I believe that by displaying this data, I am able to help the viewer understand the underlying motives of the investors as well as comprehend the roles that PJM and Dominion play in solar in Virginia in general and more specifically, Spotsylvania solar. Some of this data was obtained from arcgisonline in addition to the U.S. Energy Information Administration and the Data Center Knowledge database.

Results:

The entity known as the biggest investor, Microsoft, has agreed to purchase 315 of the 500 Megawatts from sPower. This deal has become known as the largest corporate solar deal in the United States' history (Blackwell, 2018). The purpose behind this investment can be attributed to the sustainability goals outlined in their environmental reports. Microsoft previously made a goal to power at least 50% of their data centers with clean energy by 2018. Through other investments in renewables, Microsoft was able to achieve this goal. Following this achievement, their next goal is to power at least 60% of their data centers with clean energy by 2020 (Blackwell, 2018). In addition to the goals for their data centers, Microsoft has made a dedication to carbon neutrality. Since 2012, their global operations have remained carbon neutral and this initiative is achieved through the use of an internal carbon fee. The purpose of this fee is to hold groups within the company responsible for their emissions. All funds gathered from the implementation of the carbon fee is allocated towards the purchase of renewables (Microsoft, 2016). When evaluating all of Microsoft's renewable initiatives, most of Microsoft's investments have been in wind power; however, Microsoft is currently involved with two other solar

installations, one in Singapore producing 60 MW and another in Virginia producing 20 MW (Smith, 2018).

The 315 MW from the Spostylvania Solar Farm will be directed to Microsoft's two Virginia data centers which are located in Ashburn and Boydton. Data centers are locations that facilitate the storage and distribution of data for everyday use and are essential to the operations of businesses especially Microsoft. The Virginia data center market is the largest not only in the United States but also in the world. There are currently 164 data centers located throughout Virginia, developed by 48 different providers. The expansion of the Virginia market has come as a result of the fast connections to the network, the business-friendly environment, as well as the proximity to D.C. (Miller, 2018). The placement of these data centers does not solely benefit the providers themselves, but has also brought significant benefits to Virginia and its economy. As a direct result of the expansion of the data center market in Virginia, 43,000 jobs have been created. These jobs are not solely located within the data centers, but develop within companies that serve the data centers, having a trickling effect throughout Virginia. The creation of these 43,000 jobs has led to a generation \$3.2 billion dollars in wages (Leach, 2018).

Although data centers are able to bring long and lasting prosperity to the economy, they cause significant negative impacts to society. Data centers require tremendous amounts of electricity in order to operate. Globally, data centers account for more than 3% of the world energy demand. Furthermore, data centers are responsible for emitting about 2% of the world's greenhouse gases with their carbon dioxide emissions equal to those of the airline industry (Pearce, 2018). The impact of data centers on the environment has increasingly entered the sphere of public knowledge, which has led to a call for greater responsibility and accountability. The public has placed pressure on the data center providers to decrease the carbon emissions of

these facilities and make them more sustainable. Some of the methods used by these corporations to reduce their carbon footprint include powering the facilities using renewable energy as well as making the centers themselves more efficient (Pearce, 2018).

Microsoft has plans to make their own data centers more efficient through partnerships with outside companies. Microsoft is partnering with two different companies, McKinstry and Cummins, to execute their plan toward making their data centers more sustainable. This plan is a pilot program designed to reduce the inefficiency within their data centers by directly powering the facilities with natural gas rather than by the electrical grid (Belady, 2017). This will remove the steps that involve the transmission of energy that result in energy loss. With more efficient means to power their data centers, Microsoft will be reducing their energy consumption.

Apple in collaboration with Akamai, Etsy, and Swiss Re has agreed to purchase 165 Megawatts from the Spotsylvania solar facility. Through this collaboration with apple, the three other companies were able to engage with renewable energy at more competitive prices within the PJM market than they were previously able to do on their own. Their collaboration does not end with Spotsylvania, but also includes the purchase of 125 MW from a wind farm near Chicago (Akamai Technologies, 2018). Apple is a corporate leader in the use of renewable energy, running 100% of their offices, data centers, and retail stores in the United States with renewable energy. Apple facilities as well as those of their suppliers depend heavily on a mix of renewable energies (Apple, 2018). Apple has twenty-five operational renewable energy projects. 48% of their total energy produced by renewables comes from wind power and 46% comes from solar. Lesser amounts of energy are produced from biomass and low-impact hydro (Apple, 2018). Their renewable mix comes from renewable energy projects owned by Apple as well as from renewable energy purchasing contracts. Apple has demonstrated their dedication to the

natural environment and spearheaded these renewable projects through their environmental reports, which they have been producing for eleven years. Within these plans, they have developed three main priorities: climate change, resources, and safer materials (Apple, 2018). Their clear focus for climate change is a reduction of their carbon footprint.

Akamai, Etsy, and Swiss Re follow in Apple's footsteps with their environmental policies and future energy goals. Akamai is a network delivery company that prides itself on providing secure and speedy service. Akamai has established a plan to reduce their greenhouse gas emissions through the procurement of renewable energy. In this plan they have developed 2020 renewable energy goals which include a reduction of greenhouse gas emissions below 2015 levels by ensuring that 50% of the energy consumed by the company is generated by renewable sources (Akamai Technologies, 2018).

The next collaborator, Etsy, an ecommerce website, has also established renewable energy goals for 2020. By 2020, Etsy plans to use 100% renewable energy in their operations. They have stated that this 2020 goal will be achieved through the Spotsylvania and Chicago renewable energy purchases. Etsy's sustainability plans further include the commitment to restructuring their facilities (Reisinger, 2019). They intend on restructuring in order to ensure greater efficiency in their energy usage. In addition, when shopping on the Etsy website, upon check out, Etsy provides the opportunity for the customer to choose carbon offsetting for shipping their order.

The final collaborator, Swiss Re, a insurance and reinsurance provider, markets themselves as a leader in mitigating climate risk. They too have developed a plan for increasing the renewable energy sources that provide power to their operations. Swiss Re has committed to

using 100% renewable energy sources for power by 2020 (Swiss Re, 2019). The corporation also possesses initiatives to reduce their carbon dioxide emissions per employee.

The University of Richmond is the final investor in the 500 MW solar installation. Of the 500 MW produced in Spotsylvania, the University will be purchasing 20 MW through a purchase power agreement. These designated panels are referred to as the Spider Solar Project by the University. The involvement of the University in this project can be attributed to their ongoing sustainability goals and their Climate Action Plan. In 2010, the University developed a Climate Action Plan, making a commitment to become 100% carbon neutral by 2050 with interim goals to reduce greenhouse gases 30% by 2020. The University has been engaging with solar energy projects since 2013, when they began purchasing renewable energy credits (Andrejewski, 2019). These credits allow entities to purchase property rights to renewable electricity generation. Moreover, through Dominion Energy's pilot Power Purchase Agreement, the University was able to work with a third party to install a 205 kW solar array on the roof of the Weinstein Center for Recreation and Wellness. This allows the University to reach their goal of producing 1% of their energy needs with renewables on campus.

The University claims that the Spotsylvania solar purchase will reduce their greenhouse gas emissions by 60%. The energy from this solar installation allows the University to match 100% of the electricity they consume with renewable energy, which means that for every MWh of electricity consumed by the University, an equivalent amount will be added to the grid from the solar panels (Andrejewski, 2019). The monetary agreement for the 20 MW was set at \$25 per MWh. This agreement locks the price of electricity to the University at \$25 per MWh, so when the grid cost exceeds this value, the University owes money to sPower; however, when the cost falls under this value, money is owed to the University by sPower (Andrejewski, 2019).

The renewable energy gains are not the only benefits that the University will be acquiring through this agreement. In addition to matching their energy consumption with renewable energy, the University is also developing a close relationship with sPower. The relationship between the two will provide educational opportunities for students. sPower will be administering an office in Richmond, which will allow for internship opportunities for students of the University. In addition, sPower has agreed to provide \$20,000 to the University each year to be allotted to research funding and grants (Andrejewski, 2019). This relationship demonstrates the interconnection that the two entities will continue to have in the years to come.

In addition to those corporations purchasing percentages of the energy produced, Dominion Energy and PJM also play vital roles in the Spotsylvania Solar Project. Dominion Energy is the main utility provider in Virginia and distributes their energy using the PJM electric grid. Dominion Energy provides electricity in 19 states and their 2017 energy mix is comprised of 43% Nuclear, 37% Natural Gas, 15% Coal, 4% renewables, and 1% coming from other sources (Dominion Energy, 2019b). Clearly, solar does not make up a significant portion of their energy sources; however, Dominion has implemented 2030 goals to reduce their carbon intensity by 60% and their methane intensity by 50% from 2000 levels. In addition, over the past five years, Dominion has contributed \$3.5 billion dollars in investments towards renewable energy (Dominion Energy's Solar Energy Report, 2018).

Their investments in renewable projects have allowed Dominion to become ranked fourth in the nation in utilities for solar energy. In all 19 states served by Dominion, they own a total of 49 solar facilities. In Virginia more specifically, Dominion owns 13 solar installations, 5 of which were built directly by Dominion and 8 were acquired from private companies (Dominion Energy, 2019a). In addition to the installations that Dominion owns, they present opportunities

for private groups to engage with renewables. Through their solar purchasing program, Dominion can purchase energy produced by privately owned solar installations. This program allows the private entity to install and own the solar array but sell the electricity to Dominion Energy at 15 cents per kWh (Dominion Energy, 2019a). In addition to this program, Dominion also has a power purchase agreement. This program allows for third parties to finance and implement solar and wind generation facilities on private properties. The owner and the operator of the facility is permitted to sell the electricity to the private group if the capacity is between 50 kW and 1 MW (Dominion Energy's Solar Energy Report, 2018). Through this agreement, the University of Richmond was able to have a solar array installed on campus by a third party.

As mentioned previously, the energy produced will be sold to the PJM grid. PJM Interconnection is a regional transitional organization which means that they are a third party organization that facilitates the wholesale electricity market. These organizations do not generate power, but they plan, control, and monitor the electric grid in order to ensure its stability and reliability (PJM, 2019). Furthermore, PJM coordinates the operations of power utilities, generators, and marketers. PJM is located in 13 states (Virginia, West Virginia, Delaware, Maryland, New Jersey, Pennsylvania, Ohio, Illinois, Indiana, Michigan, Kentucky, North Carolina, and Tennessee) as well as the District of Columbia providing 65 million people with power (PJM, n.d.).

To understand their role in the Spotsylvania solar generation, one must understand the use of the electric grid. The electric grid is an electrical power system network that provides a connection between fuel generation and consumption. The grid includes transmission stations and substations that transform the voltage of electricity to make it available for consumption (Union of Concerned Scientists, 2015). PJM works with several utility companies in the U.S. and

specifically three in Virginia: Dominion, Allegheny Power Systems, and American Electric Power Co. Inc. The Spotsylvania Solar Project is located in the PJM-Dominion Energy hub (PJM, n.d.). A Dominion substation is located in close proximity to the solar project, creating greater ease in transferring this energy to the grid. The energy generated by the Spotsylvania solar farm will be sold through the PJM grid.

Discussion:

The analysis of the sustainability and renewable energy goals that each investor has developed clearly demonstrate a form of corporate social responsibility. In order to adhere to the public desire to reduce greenhouse gas emissions and carbon footprints, these companies have pledged to either run their operations using renewable energy or take part in the purchase of offsets. Either way, each company is investing in renewable energy to increase the generation worldwide and demonstrate to their consumers that climate change is one of their main priorities.

Although the major investors claim to strive towards operating their facilities by 100% renewable energy, they are sometimes providing a false impression of the energy that their consumption is sourced by. These investors are purchasing energy from the solar project in order to offset their consumption of fossil fuels and sell the electricity to the PJM grid. When Apple claims that 100% of their operations are powered by renewable energy, they simply mean that their electricity consumption from fossil fuel sources is matched by investments in renewables. Although, some corporations, like Apple, provide dishonest impressions, some companies and organizations provide a more honest approach towards their investments in renewables, such as the University of Richmond. The University continuously provides an honest explanation of the purpose of their purchase of 20 MW from the SPotsylvania solar project and its end use, to match the electricity consumed on campus. Offsets merely serve as methods to establish carbon

neutrality, or to match the organization's fossil fuel consumption with renewable energy. Offsets are often considered a method of greenwashing, making a group seem more environmentally sound than they are in actuality. By engaging with offsets or matching electricity consumption, the carbon emissions that result from direct consumption of energy still exist and are not eliminated by investing in energy that produces reduced amount of carbon dioxide.

Dominion Energy's control on energy generation and consumption in Virginia does create obstacles to household and commercial use of renewable energy. Dominion's Power Purchase Agreement and Solar Purchasing Program allow ways for private individuals and groups to develop and use solar installations, but they also limit the amount of energy that can be generated by these installations. Furthermore, these agreements provide disincentives to producing greater amounts of energy from renewable sources. Compared to some other states, owning the means to produce your own renewable energy is much more difficult in Virginia.

Conclusion:

The Spotsylvania Solar Project has provided the opportunity for large corporations to invest in solar energy and contribute greater amounts of renewable energy to the electric grid. The driving force behind each investor's engagement is the desire to reach their sustainability and renewable energy goals that they have developed through their corporate social responsibility plans. Corporate social responsibility is a reasonable explanation for their interest in setting these environmentally conscious goals and is evident in many of the mission statements found in their environmental reports; however, these reports do often implement the method of greenwashing in order to make their offsets seem as though the companies power all of their facilities directly with renewable energy. Despite the claims made by the corporations in their environmental and energy reports, most of the energy produced at the solar facility will be

sold to the PJM grid and will not power the corporations' facilities; however, engaging in this solar project will allow a greater portion of PJM electrical grid sources to come from renewable energy, spreading the generated electricity around Virginia.

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