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# The Sun Shines for Everyone: Creating Community Solar Business Models That Include Culturally and Geographically Diverse Low-Income Americans

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## **The Sun Shines for Everyone**

Creating Community Solar Business Models That Include Culturally and Geographically Diverse  
Low-Income Americans

### **Problem Statement:**

Solar energy has often been called “the people’s energy”. This is because unlike all other known forms of energy (i.e. coal, gas, wind, nuclear, etc.), solar can be produced at or close to where it is used. As a result, thousands of Americans have become their own energy producers, creating electricity from their own rooftop solar panels. In addition, community solar programs have emerged to spread the benefits of solar across different neighborhoods. In the United States, community solar programs are working to allow people who have historically been left out of the benefits of solar energy to buy or invest in solar in the form of shared solar arrays. At least fifteen states and Washington D.C. have legislation authorizing shared renewable energy programs. Many other utilities also offer these shared solar programs, also known as “community solar gardens”. However, despite such local solar innovation and national solar growth, there is an ethical problem with standard US solar business models. Many studies have noted that these models do not serve low-income Americans. (G W Solar Institute, Bird & Hernandez, 2010) Recent federal grant initiatives like the 2017 “Solar in Your Community Challenge” are trying to incentivize solar developers to create business models that will solve this “solar income gap”. Clearly, government leaders are looking to local innovators to create new, more democratic solar business plans so that all Americans, including low-income, can access the benefits of solar energy. My research project will explore this ethical issue by looking

at how two different emerging community solar business models--community trust ownership and community co-op ownership-are succeeding in closing the solar income gap for two diverse low-income communities, one in Minnesota and the other in Arizona.

### **Literature Review:** Key Concepts in Community Solar

Community solar is a newcomer to the US electricity sector, which has been dominated by large, centralized, fossil-fueled energy monopolies. The literature offers several key concepts that are important to understanding the emerging area of community solar: extreme energy, distributed generation, community energy, energy democracy, and citizen benefits. I offer a description of these key concepts below.

In his book “Power from the People”, energy expert Greg Pahl notes that we are currently entering an age of “**extreme energy**” due to the rising financial and environmental costs associated with most of the world’s energy sources. “Our three biggest uses of energy in the United States are for transportation, electricity generation, and space heating and cooling,” says Pahl. “All three of these sectors are largely dependent on fossil fuels; sources that many experts believe have no long-term future.” (Pahl 2013) In addition, over 90 percent of power generation in the U.S. comes from large, centralized, highly polluting, nonrenewable sources of energy. This energy is delivered through more than three hundred thousand miles of long and brittle transmission lines, and then is squandered through inefficiency and waste. In the words of Ellen Vancko, a spokesperson for the North American Electric Reliability Council, “We are trying to build a 21<sup>st</sup> century electric marketplace on top of a 20<sup>th</sup> century electric grid. No significant additions have been made to the grid in over twenty years of bulk electric transmission, yet we have had significant increases in the amount of generation.” (Pahl, 2013)

However, there is an alternative to continuing to build upon an outdated grid: distributed generation.

**Distributed generation** offers a way for communities to produce their own local and renewable energy. Distributed generation is a power scheme in which electricity generation takes place not just at a large centralized plant but in many smaller facilities distributed throughout an area (ex. rooftop solar panels). Distributed generation can save money on out of state transportation costs, defer transmission line upgrades, and better protect the grid from massive failures or shutdowns. (Pahl 2013) Furthermore, distributed generation can keep more money moving through local economies, putting social and economic power into the hands of the local communities that consume the energy.

According to Craig Morris and Arne Jungjohann, there are several core principles of **community energy** that allow it to serve the common good. First off, community energy is community owned. Community ownership not only allows for local representation in the decision making process, but it also reinforces accountability of the decision makers to actually represent the people who they are serving. Secondly, the enormous benefits that renewables have over nonrenewables makes it crucial that community energy is made up of renewable sources. Renewable energy will not run out, making it ideal for building local energy security. Also, because renewables are available throughout a wide geographic area, private entities have difficulties monopolizing their point of production. Finally, renewables are much cleaner than nonrenewables, making them the best option for passing on a healthy and sustainable community to future generations. (Morris & Jungjohann 2016)

An increased use of community energy is key to our transition towards **energy democracy**. Energy democracy means that community residents are the innovators, planners, and decision makers on how their energy is used. When ownership is no longer restricted to

monopoly utility companies, millions of residents and businesses will be able to control their own energy futures. (Morris and Juniohann 2016)

In order to ensure that no one is left out of the transition towards energy democracy, everyone should have the right to make and sell energy at a fair price. This includes both the local community members as well as the utility companies. However, if the benefits of energy projects are going to the private sector, the private sector must also accept and deal with all the related risks. (Johns 2015)

While **cost** is important, so too are the **citizens benefits**, which should outweigh low prices. These determined prices should encompass all costs, including health care costs and environmental impacts. This ensures that the well being of the community is the most important aspect of any pricing decision. (Johns 2015)

Using community energy, we have the opportunity to address an **ethical problem** in our society regarding low-income energy use. In the United States, low-income households spend a larger proportion of their income on energy than other Americans do. Southern cities like Memphis and New Orleans have the highest energy burdens, as energy demand is driven mostly by electricity used for air conditioning. (Grimley 2017) These southeastern cities are followed closely by northern cities, where heating bills dominate energy demand. In addition, traditional forms of energy production disproportionately and adversely affect low-income neighborhoods. According to the National Association for the Advancement of Colored People, people of color and low-income households are much more likely to live in close proximity to a coal plant, making them more likely to suffer from higher incidence of poor health, higher medical bills, and lower property values. (Grimley 2017) Local and renewable energy has a huge opportunity to empower these low-income communities with energy assistance and more sustainable neighborhoods.

In my review of the literature on community solar, two models of community solar stood out for and it is important to note how each of these solar ownership models emerged from a longer history of social justice. The first, **community trust ownership**, builds on the history of the community land trust movement. For community trust solar advocates, the process of including low-income communities into the benefits of solar mirrors the process of including low-income communities into urban real estate during the later parts of the twentieth century. Understanding how the community land trust movement solved this problem of market access can help advance the access of solar energy to low-income Americans today. (Grimley 2017)

During the 1960's and 1970's, community trust activist advocates pondered how to connect the urban poor to land access. One of the key problems standing in their way was private land ownership and its related tax policies. According to the American political economist Henry George, who argued that all wealth derived from land, private land ownership encouraged land speculation, a social practice that George placed at the center of economic inflation and the unequal distribution of wealth. Community land trust (CLT) advocates looked to solve this problem through a trusteeship approach to land use. Noting the longer heritage of Native American stewardship approach to land use, CLT advocates saw themselves as reinstating the land trust concept in North America rather than initiating it. CLT advocates were also influenced by the work of Ralph Borsodi, who argued that possessions be separated between property and trustery: "Property is created by man through his labor. Trustery includes land, the atmosphere, rivers, lakes, seas, natural forests, and mineral resources of the earth. Since these do not come into existence as a result of human labor, they cannot be morally owned; they can only be held in trust." (Grimley 2017)

In the early stages of the community land trust movement, several kinds of institutions functioned with the idea of "trustery". These included New Towns, Indian Tribal Lands,

Mexican-American Claims, Alaskan Land Claims, Hutterite Communities, and others. (The Solar Commons 2017) The members of these communities held secure “user rights” through long term leases. User rights allowed the leasers of the land trust to make their own improvements on the land through building houses, gardens, and even small businesses. “Indeed, members of the Community Land Trust movement made a distinction between the ownership of the land with its natural resources and the ownership of human improvements made on the land.”(The Solar Commons 2017) The land trust concept is not concerned primarily with common ownership but rather ownership for the common good. (The Solar Commons 2017)

Some of the key concepts that came out of the Community Land Trust movement (user rights, collective ownership of the “improvements”, ownership for the common good) have been instrumental in shaping the philosophy of the Solar Commons community trust solar model.

The second model of community solar that struck my attention in my review of the literature **is the cooperative model**. The idea of a cooperative is not new. For as long as humans have been roaming the earth, our societies have cooperated to share food, water, and shelter in order to improve the chances of survival. It was during the late 18<sup>th</sup> century, when society began industrializing and people were flocking to cities, that cooperatives really began to take form. As working people lost their control over food and living conditions, cooperatives were set up to protect the interests of the less powerful members of society. In England, when consumers became sick of storeowners hiking up prices and limiting choice, they decided to purchase groceries together. They found out that they were able to obtain higher quality products while actually saving money when they purchased goods from a wholesale dealer and divided them up equally among themselves. In the United States, the roots of cooperatives can be traced back to colonial times, where farmers worked together for the benefit of each other.

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As consumer groups started taking notice of farmer successes, consumer protection associations sprouted up. While many of these early cooperatives failed to a lack of financial capital, by the 1900's cooperatives began to have true, long-lasting success in the United States. (Zimbelman)

The value of cooperatives is evidenced through the social opportunities it provides to its members. In 1844, twenty-eight working people in Rochdale, England set up a shop where they could get honest food at an honest price. This group set up their shop using cooperative principles, where anyone could join regardless of their religion, status, or political affiliation. By 1860, this small cooperative had expanded to include six additional stores. The cooperative allowed each member to have one vote, and for many women this was their first opportunity to participate in voting, long before women could participate in general elections. In addition, cooperatives were way ahead of their time when it came to pensions and working conditions. (Zimbelman) Because of the forward thinking ideas that cooperatives have historically offered, it does not surprise me to see this model of ownership emerging in the new distributed technology of solar energy.

Community solar is a relatively new way to organize energy production in the US. The literature shows that the term "community solar" has different meanings in different states. For example, some states-consider community solar uniquely as a business model to save customers money, relying on net metering to allow consumers to capture value. Net metering is billing system that allows those who own or participate in solar energy to get credit on their electricity bill based on the amount of energy their panel generates. (Solar Energy Industries Association) Other states allow customers to pay a premium to participate in community solar owned by a utility. (Grimley 2017) So, whether a state views community solar as something



that saves people money or something that only people with a lot of money can afford, the literature suggests that there are very few models of community solar that actually serve low-income Americans.

The literature review reveals that two new models of community solar—cooperatively owned and community trust owned—have the potential to close the “solar income gap” and help solar energy technology serve low-income communities. These are the two models around which I have done my case studies on low-income community solar.

### Methodology

To answer my research question- what can be learned from examining the new business solutions of nonprofit organizations working to solve the inequity of solar access on behalf of culturally and geographically diverse low-income communities- I use an ethnographic case study approach. The case study method is useful to explore a topic in its social context. Because I am exploring how a specific solar business model serves its geographically and culturally specific low-income community, this method is useful for my study. An ethnographer begins with a general understanding of an issue. Then, in conversation with “informants” in the “field”, the researcher develops a deeper understanding of how the people involved feel and think and what values motivate them to act. Ethnographic researchers use site visits, participant observation, conversations and semi-structured interviews to gather data that will allow them to create a “thick”, socially embedded description of the issue or phenomena under investigation. The ethnographer records field note observations and then analyzes these notes in order to describe local relationships (formal and informal) and the understandings and meanings that the people involved give to their situation.

The following two ethnographic case studies offer a description of two community solar business models (community trust ownership and community coop ownership) used to serve two diverse low-income communities (a low-income, largely Latino community in Tucson, Arizona and a low-income urban neighborhood in Minneapolis, Minnesota). The case studies lay out the specific solar business model and, based on my ethnographic research, show the various ways that the model serves its specific low-income community.

Ethnographic Fieldwork Conducted For Case Study/Business Model #1: Solar Commons

**Community Trust Solar Ownership in Tucson Arizona:** For this case, I read website materials for the Solar Commons, a new nonprofit based in Duluth, Minnesota but operating nationally. I read a feasibility study that assessed how a Solar Commons ownership model could be used in Northern Minnesota; I interviewed the Founder and Director of the Solar Commons Nonprofit, Kathryn Milun, a professor of anthropology at the University of Minnesota Duluth. Professor Milun provided me with literature on the community trust ownership model and allowed me to shadow her for several days while she conducted phone meetings and board meetings concerning the Minnesota and Arizona Solar Commons demonstration projects. When the Minnesota Solar Commons project fell through, Dr. Milun directed me to more in depth literature, legal documents, and phone meeting notes from the successful Arizona field site.

Ethnographic Fieldwork Conducted For Case Study/Business Model #2: Cooperative

**Ownership in Urban Minneapolis**

For this case I read website materials from the cooperatively owned, nonprofit solar company Cooperative Energy Futures (CEF). CEF is located in Minneapolis and has partnerships with community solar networks throughout the state of Minnesota. CEF develops and builds community solar projects for specific community groups in the Twin Cities. I interviewed the

General Manager and Founder of CEF, Timothy Den-Herder Thomas. I also spoke with a CEF coop member, Kathleen Fluegel, about her motivations for joining and her experience with community solar. I visited the Shiloh Temple in North Minneapolis (on whose roof the first CEF solar array is being built) and met several members of CEF that are working on community garden projects in and around the Saint Cloud area. I also read background material on the history of the cooperative ownership model in the US.

Analysis and Conclusions of the Case Studies:

Following the case studies below, I provide a comparative analysis of the two cases considering their strengths, weaknesses, opportunities and threats. In my conclusion, I consider how these specific low-income community solar business models might be adapted to benefit the Somali community of Saint Cloud, a local community where I have done volunteer work and ethnographic research. (This later project will be the topic of my senior capstone project and thesis.)

Case Study One: Community Trust Ownership-- Solar Commons

Organization- The Solar Commons, a Duluth-based nonprofit founded in 2016

The Solar Commons is a new nonprofit that has pioneered a way for low-income Americans to gain access to the benefits of solar energy by using a trust ownership model.

**Background** The idea of the Solar Commons comes out of the academic research of Professor Kathryn Milun, an anthropologist at the University of Minnesota Duluth. Milun's research focused on "commons:" resources like water or pasture land that are equitably and sustainably shared within a community. In the words of the Solar Commons, the commons are "how people around the world protect and manage shared resources to create commonwealth benefits for the whole community." (The Solar Commons 2017) In creating the Solar Commons, Dr. Milun is

moving her academic research on commons into the public sector by claiming that the sun's capacity to produce energy is a commons. "The sun shines for everyone, but the current monopoly ownership of the US electricity sector limits who can access the sun's energy to generate electricity." (Kathryn Milun, Personal Communication, 7/25/2017) Commons are generally owned as public trust property with states or local communities acting as "trustees" who manage that property on behalf of "commoners." Using community trust ownership for solar energy, Milun believes, will allow more people—especially low-income people—to access the benefits of the sun's energy. The Solar Commons nonprofit uses a multi-mission approach to serve low-income Americans with community solar. The first part of the Solar Commons mission is research and development. Through research and development, the Solar Commons has created unique community trust business models using trust law. The second part of the Solar Commons mission is to test the trust models in actual demonstration projects. In order to do this, the Solar Commons works with partners to build solar arrays that can be owned under the Solar Commons community trust model. The Vermont Law School is working with the Solar Commons to create open source legal templates based on these demonstration projects so that community trust ownership of solar can be freely available for communities to create their own "solar commons." The third part of the Solar Commons' mission is to use public art that can spread awareness and understanding about the connections among community trust solar ownership, social justice, and the ecological health of the planet. (Kathryn Milun, Personal Communication, 7/25/2017)

The Solar Commons distinguishes between their "community trust solar" and the traditional definition of community solar for several reasons. According to the Solar Commons, the traditional definition of community solar is a model where individuals are offered an opportunity to purchase solar panels, which are part of a bigger solar array. These individuals

can then take advantage of an economy of scale, where the more members involved the cheaper it becomes. However, this traditional definition lacks a true community component. According to this definition, community solar is more focused on maximizing individual's benefits through increased participation rather than uniting a community. Another aspect of community solar is the ownership of the array. Currently, many community solar models are owned by a utility company rather than by members of a local community. If the utility company is the owner of the community solar array, then their model of community solar involves renting out space on their array to customers who want to take part in using solar energy. This model is feasible for those who can afford to buy a piece of an array, but leaves out those who cannot afford the upfront capital that is required to invest in an array. For this reason, many low to mid income Americans are being left out of the benefits of community solar. (Kathryn Milun, Personal Communication, 7/25/2017)

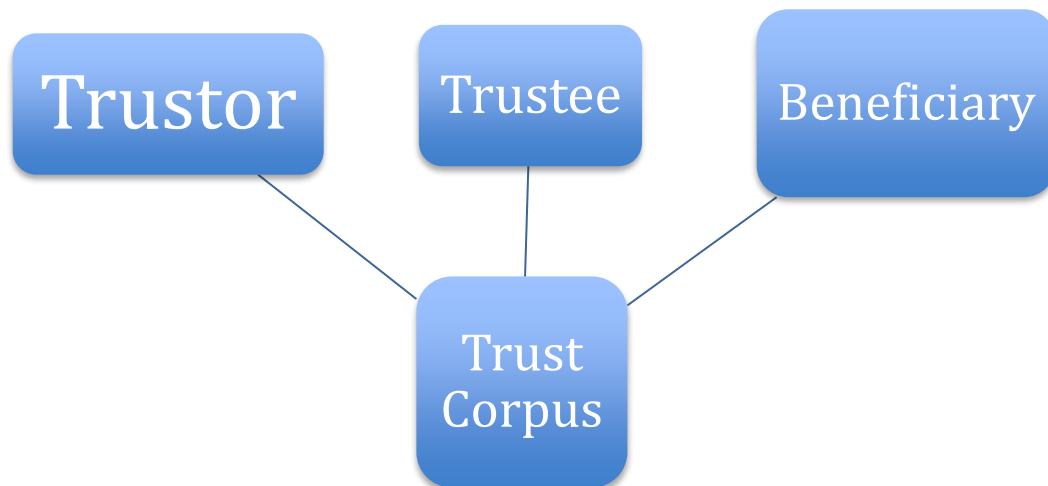
The Solar Commons offers a unique way to serve low-income communities through the benefits of solar energy. This is made evident through their Tucson, Arizona-based demonstration project which serves two specific low-income groups. It works like this: The Solar Commons donates a solar array to the Tucson Young Womens Christian Association (YWCA) with the condition that the YWCA calculate the solar savings (credit) it sees on its monthly electric bill and put these savings into a community trust account. While the solar array will be sited on YWCA land and owned by the YWCA, the monthly savings from this array will be managed by a trustee, the PPEP Microbusiness and Housing Development Corporation, a local Community Development Financial Institution. The trustee will make sure that the YWCA's array electricity savings will go towards two programs that will assist and empower local communities within the Tucson area. The first program is an energy assistance program called LIHEAP, or Low-Income Heating and Energy Assistance Program. LIHEAP helps low-

income Americans pay for their heating/cooling energy needs by providing qualified participants assistance with their bill payments. While this federal program (stemming from the 1960s-era war on poverty) is functional in serving it's role of energy assistance, it also requires that its participants prove citizenship in order to qualify for LIHEAP benefits. But Tucson is a border town near Mexico with many undocumented residents living and working in the city. So, what has the Solar Commons done to make sure that a greater number of Tucson's community members of have access to the benefits of the donated solar array? By talking to employees at Tucson's LIHEAP office, the Solar Commons discovered a need for a separate fund that could serve low-income community members who couldn't prove citizenship. By giving LIHEAP a pool of money that can be dispersed to qualified low-income community members regardless of their citizenship status, they are helping some of Tucson's ethnically diverse residents who otherwise would be turned away. (Kathryn Milun, Personal Communication, 7/25/2017)

The second program served by the Solar Commons community trust is a jobs-training program for low-income Tucson residents. There is an old saying that goes as follows: "Give a man a fish, he eats for a day. Teach a man to fish, he will never go hungry". This proverb demonstrates the need for empowerment when helping low-income communities. While energy assistance helps people in poverty to pay their monthly electricity bills it does not help enough people in the long term. In addition, the housing structures occupied by energy assistance participants are often poorly insulated which leads to expensive heated or cooled air escaping into the outdoors and unnecessarily higher electricity bills. For these reasons, the Solar Commons is looking past energy assistance to empower communities by funding a job-training program for building water-harvesting infrastructure in the city of Tucson. The program will teach low-income residents of Tucson who may not have job skills how to harvest

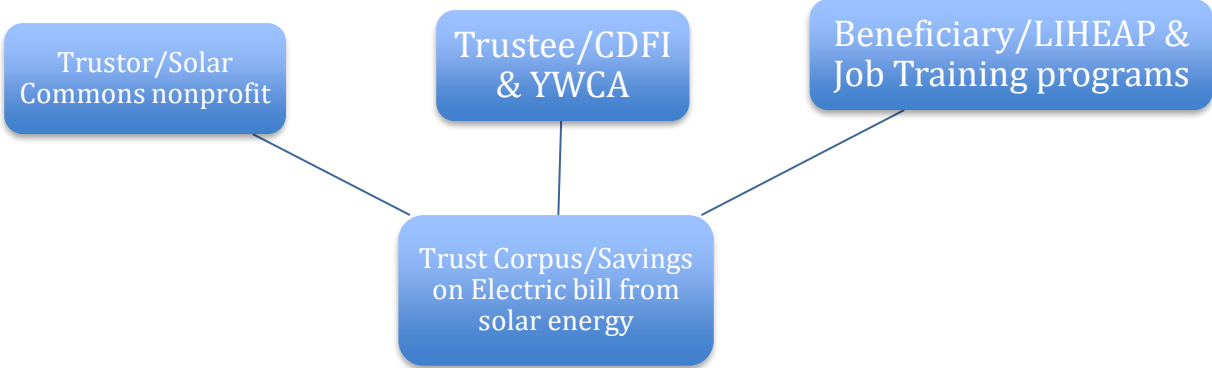
rainwater and build water-harvesting infrastructure. With these skills, water harvesters could create their own businesses and wean themselves off of financial assistance programs. Furthermore, water harvesting offers a solution for Tucson's growing water crisis. It is estimated that by 2020, Tucson will have used the last of its ground water. This means that Tucson will have to be even more dependent on the already strained Colorado River for water. Water harvesting in Tucson allows for the city to capture and store rain water right where it falls, creating a sustainable water flow that will bring ecological as well as economic benefits right to local communities. (Kathryn Milun, Personal Communication, 7/25/2017)

The Solar Commons community trust ownership model is innovative and creative in the way it makes the benefits of solar energy accessible to low-income communities. All trusts have this legal ownership structure:



The diagram below lays out the structure of trust ownership that the Solar Commons nonprofit has adapted to serve low-income communities through the technology of distributed solar energy in the United States.

DIAGRAM

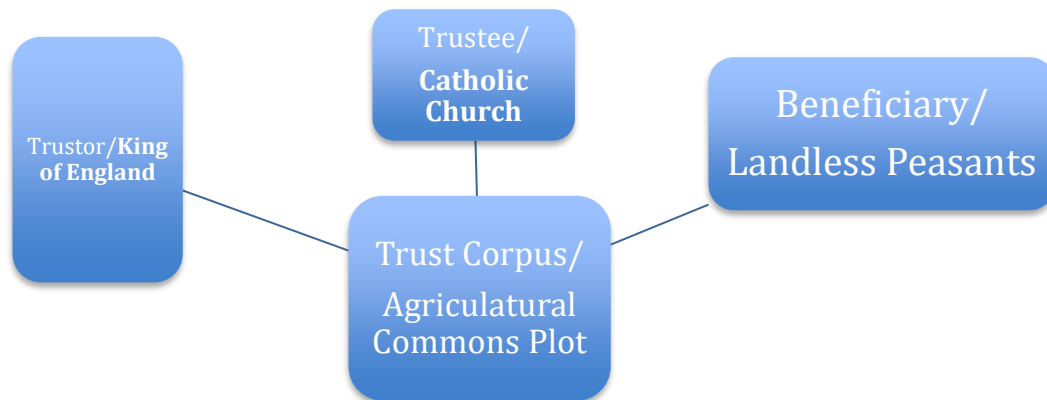


The Solar Commons trust model is based on one of oldest forms of property in the English Common Law tradition. Trust property is made up of three different pieces: the trustor, the trustee, and the beneficiary, who all are connected through the trust property. The trustor is the first piece of the trust model. The trustor donates the trust property and determines the obligations and rules that the property must follow. The trustor then chooses a trustee to manage the property. The trustee runs the trust property, ensuring that the benefits of the property are going to the trustor-chosen beneficiary. The beneficiary is the final piece of the trust model and receives the benefits of the trust property. The roots of the Solar Commons trust model are tied to the historical structure of English Commons and early trust property formed in medieval English L law. During this time period, the kings owned all land. The vast majority of the land’s residents, were landless peasant farmers who needed a way to sustain themselves. And so, the trust concept was born. The king acted as the trustor, donating a piece of farmland that could be used by the beneficiaries, the peasants. The king determined the



conditions under which the designated piece of land was to be used, but did not manage or enforce these rules. Instead, he choose a powerful and well-established institution--the church—to be the “trustee” and manage the land. The church was given the responsibility to make sure that the benefits of the land would go to the beneficiaries. (Grimley 2017)

Diagram of medieval trust property model



This medieval trust property model was used for some time, but changed when the princes and dukes decided that they wanted access to the land as well. During the eighteenth century, a period known as the “Enclosure,” the princes and dukes took over the commons land and built fences around them blocking access to landless farmers across the English countryside. The English courts intervned only to provide peasants with a meager “right of way” to access these former commons. Right-of-way laws still exist today in England and in all lands that were once colonized by the British. According to Dr. Milun, the legal concept of “right-of-way” is a residual form of the ancient English commons. (Kathryn Milun, Personal Communication, 7/25/2017)

Right-of-way and trust law persist in the US today. Early right of way laws in the US were tweaked to serve the monopoly holdings of the oil and the railroad industries that crisscrossed nineteenth century America accessing public wilderness and private farmlands, creating benefits for American citizens and profits for private companies. These monopolies often used trust ownership to centralize and consolidate smaller companies. However, Congress put limits on monopoly trust ownership by passing measures like the Sherman Anti-Trust law that made it more difficult for businesses to exploit the trust model. Nevertheless, in the twentieth century, corporations learned to use trust law to offshore their financial assets and avoid paying US taxes. The medieval legal institution of right-of-way access was also used by electric power companies starting in the early twentieth century. These utility companies used the power of right-of-way to access federal and private land throughout the country for their monopoly-owned electric grid systems. According to Dr. Milun, these utility companies now hold exclusive “franchise agreements” with local cities, states, and federal governments and are successfully using their right-of-way franchise to exclude solar energy providers—large solar industry providers and small community solar providers-- from accessing the public right-of-way to distribute clean, renewable energy. (Kathryn Milun, Personal Communication, 7/25/2017) These historical uses of trust and right-of-way law present many legal challenges for the Solar Commons model which wants to innovate community trust ownership for the new technology of distributed solar energy and for the benefit of low-income Americans.

Like all innovation, however, the Solar Commons nonprofit has run into obstacles, especially in gaining access to the grid and financing their projects. The Solar Commons trust business model is currently donation based because they are trying to prove a certain ownership structure. The Solar Commons nonprofit would like to move into a different, more sustainable form of financing but for now they rely on large donations to maintain their

projects. Apart from financing, gaining access to the grid has proved to be an enormous challenge for the Solar Commons. The right-of-way franchise agreements mentioned above allow the dominant fossil-fueled power companies to control the electric grid and exclude others, like community Solar Commons installations, from accessing the grid's electricity delivery system. Thus, in order for the Solar Common's trust property, the array, to operate, it must first get the approval of the utility company in the form of an interconnection agreement. In the case of the YWCA Solar Commons, the utility sent a letter to the YWCA informing them that the utility company had the right to increase the YWCA's electricity costs in the future. (Kathryn Milun, Personal Communication, 7/25/2017) This letter almost derailed the entire Solar Commons project because the YWCA became rightly afraid of getting caught with a solar array that no longer made financial sense. If the utility company raised the fees they place on the electric bills of their customers who produce their own solar energy, this could offset the savings from the trust property, leaving no money for the beneficiaries but leaving the YWCA in the position of being obligated to send monthly payments to those beneficiaries. This threat of adding monthly fees to solar energy producers is a typical anti-solar strategy of fossil fueled utility companies across the US. It has been successfully used to obstruct community and rooftop solar in Nevada, Florida, Arizona, and many other sun-blessed states.

Along with bullying tactics during the interconnection application process, the Solar Commons nonprofit's Tuscon model was also almost halted due to a change in net metering laws. In order for any solar user to be plugged into both the grid and it's array, their home-state must have net metering laws. Net metering laws allow utility companies to keep track of the amount of solar energy that a grid- interconnected solar array generates and credit that electricity to the customer's bill. However, not all states have this law in place. In Arizona, net metering laws were almost repealed while the Solar Commons was in the process of setting up

their Tucson project. (Kathryn Milun, Personal Communication, 7/25/2017) This change could have also halted the entire project but the Solar Commons nonprofit managed to have the YWCA project “grandfathered” in under the older net-metering laws. Despite these complications that the Solar Commons nonprofit has encountered, they continue to fight for low-income Americans to have access to the benefits of solar energy through community trust ownership. The Solar Commons nonprofit has future plans to create Solar Commons community trust demonstration projects for tribes in Minnesota and Arizona as well as for community land trust institutions in Minnesota and Arizona. Both tribes and community land trusts serve their communities of historically low-income members making them the perfect partners for a Solar Commons demonstration project.

### Case Study #2: Cooperative Energy Futures

Cooperative Energy Futures (CEF) is a member owned energy cooperative based out of Minneapolis, Minnesota. In the words of CEF’s founder and director, Timothy Den-Herder Thomas, “The million, no billion, no trillion dollar question right now is how do we move solar from being a niche market commodity for people who have access into something that is as abundant and common place as cellphones.” According to Den-Herder Thomas, for over one hundred years, the United States has had an energy system where large; outside companies have owned and operated the production and distribution of our energy. In this system, energy users have had little to no say in how their energy works. Cooperative Energy Futures seeks to address this problem by returning consumer energy dollars back to their communities while leading the transition to clean energy.

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Cooperative Energy Futures began their research and development in 2008 and officially launched a year later. Back in 2008, CEF was made up of a band of college students at Macalester College who partnered with community leaders involved with energy efficiency. The group started to buy and use insulation and weatherization products in bulk to teach people how to make their homes more efficient. In addition, they organized group contracts for insulation purchases to make home efficiency more affordable. Several years later, CEF expanded their group contracting to include residential solar. Using a similar model, CEF gathered residents together and organized a group contract with solar installers to streamline the process while getting a better price for residents. However, Cooperative Energy Futures soon found out that while home solar and efficiency is great, it was only available to a small percentage of customers. Those who didn't own their own homes, couldn't take out a loan, or didn't have the upfront capital were excluded from participating in CEF's services. As a result, CEF has switched their focus over the past three years to community solar gardens. This way, CEF could help out those in their community who had the greatest need. (Timothy Den-Herder Thomas, Personal Communication, 8/8/2017)

Using solar to help the community has been one of Cooperative Energy Future's biggest priorities. However, community solar is a term that, according to CEF, has a loosely defined meaning and therefore doesn't always have the benefit of community in mind. CEF believes in a conceptual definition of community solar whereby a large solar array benefits (and, in CEF's opinion, is owned by) community members while providing sound financial benefits. Under this definition, community solar also is replacing dirty energy on the grid. On the other hand, community solar has a legal definition that is defined under Minnesota state law. In this context, community solar is a specific program that involves utility companies, bill-credits and subscribers. In this legal context of community solar, energy developers find a group to

subscribe to an energy garden and then the utility company credits the subscribers on their energy bill. “So, if a subscriber were to own 2% of an array or garden, then they would get a 2% credit on their energy bill from the utility for however much energy is generated.” (Timothy Den-Herder Thomas, Personal Communication, 8/8/2017) There are currently a number of developers doing community solar this way in Minnesota, but a vast majority of them are focused on making profits rather than helping the community. These developers are finding five subscribers (the minimum amount under state law) who are usually institutions in order to meet the definition of community solar. Even if they are serving residents, these private developers are offering only slight discounts to ensure a maximum return on investment. Cooperative Energy Futures thinks its great that the United States is starting to move towards cleaner energy, but sees an ethical issue in the way that the majority of developers are managing community solar. CEF believes that in order to truly call a model “community solar”, it’s benefits should actually go back into the community. By using a member owned cooperative ownership model, CEF is putting the community back in solar. (Timothy Den-Herder Thomas, Personal Communication, 8/8/2017)

Serving a community means serving all members of a community, including those who are low-income. Cooperative Energy Futures uses a variety of innovative tactics to serve the low-income community of North Minneapolis. “Despite many solar models these days requiring participants to own their own homes, we use community solar to allow anyone with a utility bill to be eligible for our services.” (Timothy Den-Herder Thomas, Personal Communication, 8/8/2017) In addition, CEF offers a pay as you go option for customers who may not have the upfront capital required to invest in solar energy. Customers who use this option actually save money on their monthly electric bills, as the monthly amount that they pay to be subscribers is less than the monthly electricity credit saved on their utility bill. While CEF is not alone in

saving their customers money on their monthly electric bill, most other developers have a minimum credit requirement in order to satisfy their financier. According to CEF, the minimum credit requirement for most developers in Minnesota is between 680-700, a number that excludes about half of the states population. “We have no minimum credit requirement, thanks largely to our backup subscriber system.” (Timothy Den-Herder Thomas, Personal Communication, 8/8/2017) This model get’s large institutions that are both financially stable and huge energy users to subscribe to a small amount of energy for an ongoing basis while also agreeing to cover members who may default. So, if one of Cooperative Energy Futures’ subscribers does indeed default, CEF can move that defaulted subscription over to their backup subscriber for a short period of time while another subscriber is found. The backup subscriber pays for the energy and also receives the bill credit while the subscription is moved. The final way that CEF brings solar access to low-income Americans is by working directly with community-based organizations that are connected to the places they are serving. According to CEF, this method has been much more effective for outreach than mass marketing.

One of the seven projects that Cooperative Energy Futures is currently working on falls right in the heart of Minneapolis at the Shiloh Temple. The Shiloh Temple is a key asset in the northern Minneapolis community and serves a largely African-American population. Financial obstacles delayed this project in its early stages, but now that all the funding has been secured, the project is expected to be complete this fall. While CEF accepted upfront subscribers who were not north Minneapolis residents for their Shiloh Project, they mandated that all pay as you go subscribers had to be residents of north Minneapolis. The solar garden, which will be built on Shiloh property, will send twenty percent of its energy generated to the Temple. Another ten percent of the garden’s energy will be sent to a nearby mosque. Fifty percent of this garden will

go right to North Minneapolis residents, while the upfront subscribers will use the remaining twenty percent. (Timothy Den-Herder Thomas, Personal Communication, 8/8/2017)



(<http://www.cleanenergyprojectbuilder.org/csg/cef-shiloh-csg> Rendition from CEF Website)

One of the upfront subscribers, Kathleen Fluegel, was drawn to participate in Cooperative Energy Future’s Shiloh project because of CEF’s “pledge to build wealth in a historically underserved community.” Fluegel is a resident of Southeastern Minneapolis, but has spent a lot of time on the north side and recognizes that her upfront investment is going to help the broad Minneapolis community be included in the transition to clean energy. “Cooperative Energy Futures does not block people based on their credit scores. In this way, they are focused on helping our community.” According to Fluegel, the process to electrify her home with solar energy has been relatively seamless. “They look at your Xcel Energy bill, then tell you how much you are available to buy. Essentially, I am paying for all the electricity in my home for the next twenty-five years up front. If I decide to move or don’t want the services



## Lindmark Fellowship: Francesco Hanson

anymore, CEF will reimburse me for the amount remaining on my contract. I can even pass on the energy contract to the next owner of my house if I decide to sell.” Fluegel even found the upfront investment to be feasible on her budget. “Cooperative Energy Futures breaks the payment into three. There was a \$2,000 initial investment required when I signed up. When CEF begins construction on the Shiloh Temple, I will pay another \$4,000. When the panels actually go online, there will be a final \$2,000 charge.” (Kathleen Fluegel, Personal Communication, 8/8/2017) Even with upfront subscribers like Kathleen, CEF’s biggest obstacles remains financing.

The main way that renewable energy projects are financed in the United States is through federal tax credits. These credits can pay for about thirty-percent of a solar system but can only be taken advantage of through tax liabilities. So, financiers of solar projects, who are usually large national companies that finance renewable energy, want to see the largest amount of tax liability possible. This usually comes from a set of energy buyers who are highly credit worthy and financially secure. Even if the financiers were to accept residential customers, they “don’t want them to be low-income”, according to the Director of CEF Timothy Den-Herder Thomas. When CEF started out, they had only two projects that equated to 800 kilo-watts. “This amount was way too small for financiers to even bother with us.” Then, in December of 2016, CEF added six additional projects that boosted their production to around 6 mega-watts. “That’s when we really started to see some success.” (Timothy Den-Herder Thomas, Personal Communication, 8/8/2017)

Most financiers are not familiar with community solar to residential customers, as they usually work with big companies. This has created another problem of convincing financiers to invest, though CEF has been able to mitigate these risks with their backup subscriber model. According to DenHerder Thomas, CEF has been able to make the case that they are positioning

themselves to be a mass market developer. “Most developers stay away from low-income residents, but with our backup model we are able to offer our services to a much wider demographic.” Another obstacle that CEF has had to tackle is interfacing with Xcel Energy, the utility company that serves the Twin Cities metro area. “Xcel gives us estimates that only they have the data to back up”, says Den-Herder Thomas. For this reason, interconnecting a residential or commercial site that is already an Xcel subscriber with a CEF solar garden requires capital. Furthermore, interconnection applications can be lengthy, usually taking between six and seven months. Once an agreement is finally reached, building of the structure takes an additional four to five months. Timothy believes that there is a reason why the installation process takes so long. “Xcel Energy would be happy to do renewable energy if they owned the structures and took in the profits”. But seeing outside companies, especially cooperatives, taking the profits and putting them back into the community, “that is something they don’t like.” (Timothy Den-Herder Thomas, Personal Communication, 8/8/2017)

Cooperative Energy Futures has created a model for community solar that generates both financial and community benefits. A subscriber of CEF can reduce their energy costs in the first year alone by about six percent, but as the utility company raises their rates, CEF’s solar is locked in place, allowing for savings to grow with time. If there is an assumed three percent energy rise from the utility company (which is a conservative estimate), overall savings by year twenty-five could rise as high as forty-six percent. With the average household spending about \$1,000 a year on energy, CEF’s model translates into some serious savings. With the financial benefits of CEF’s model so obvious, it can be easy to over look the community benefits. Because CEF is a cooperative, the profits of the organization are redistributed. In the case of the Shiloh project, where half of the subscribers are low-income North Minneapolis residents, the coop model is putting even more money in to the pockets of residents in a historically low-income

community. Furthermore, there is another community benefit that CEF is using to help serve the ethnically diverse community of Minneapolis. With solar being the fastest growing job industry in the United States today, there is a lot of job creation going on. Timothy Den-Herder Thomas and Cooperative Energy Futures is making sure that low-income and ethnically diverse communities are not being left out. “We require that fifty percent of our solar installations are done by minority labor”, says Den-Herder Thomas. “There are not many people of color who are trained in solar installing, so we partnered with a community organization to train minorities to be installers.” (Timothy Den-Herder Thomas, Personal Communication, 8/8/2017)

Cooperative Energy Futures is tackling a relatively unknown ethical issue in solar energy by using a cooperative business model. Using this model, CEF has been able to incorporate low-income residents and build wealth in their historically underserved community. With their vision of the future, CEF is making sure that solar energy boom will not leave out culturally and geographically diverse low-income Americans.

### Analysis and Conclusion

The two case studies have provided an in depth look at new community solar ownership models that include low-income Americans. Both models help close the solar income gap for low-income Americans. Both Solar Commons (SC) and Cooperative Energy Futures (CEF) support energy democracy, the transition away from dirty to clean energy sources and the right for local communities to benefit from the new, clean technology of distributed energy production. In the words of CEF, “We are hindered primarily by a lack of social technology, not energy technology.” (Cooperative Energy Futures) The following analysis examines how these

two models address issues of social equity and community ownership. It also begins the work of applying the case study insights to serve the Somali community in St. Cloud, Minnesota.

In both organizations, the idea of community ownership appears not only in the name but also in the model itself. The Solar Commons and CEF have recognized that it takes a whole community to change the way we own energy. In my discussions with the Solar Commons, I was reminded of an old phrase “It takes a village to raise a child” suggesting that the health of the community is the cornerstone for the health of its individuals. With regard to energy to we might say that when the benefits of solar energy are shared as a collective or common good, then even the poorest individuals in the community might prosper. With true community-owned solar, citizen benefits are created. Both organization have successfully demonstrated how to have community ownership but they do this in very different ways: CEF’s model shows how income-diverse members of a cooperative can share ownership to create greater social equity among members; the Solar Commons model allows low-income community members to be owners of the “benefits” that come from a community trust-owned solar energy array whose cost savings are passed on to programs that serve local low-income communities. These models both demonstrate that it is possible that the future of our energy can be in the hands of our communities. Both the Solar Commons and Cooperative Energy Futures show how solar energy can be used to create a more equitable society.

The Solar Commons unique trust-ownership model provides a legal structure that supports the kinds of community connections that would be helpful for the Somali community of Saint Cloud. In the Tucson, Arizona-based Solar Commons demonstration project with the YWCA, the Solar Commons worked with local community organizations to find out which demographics were in the greatest need of assistance and what programs might provide the

most effective assistance. Once found, the Solar Commons brought in multiple parties, including a local nonprofit community financial institution, to help manage the savings on the Solar Commons-donated solar array. Thus some of the savings from the YWCA's array will go to the local Low-Income Household Energy Assistance Program (LIHEAP) to provide energy assistance to Tucson residents who may not be able to keep their lights on. One issue with LIHEAP, which the Solar Commons discovered through communication with the local LIHEAP office, is that it requires proof of citizenship. Solar Commons was then able to create a separate pool of money for those who can prove they are low-income and eligible for LIHEAP but may not be able to prove citizenship. The Solar Commons trust fund also is sending money into a jobs training program that will be set up by the YWCA. With Arizona's mounting water crisis, water-harvesting infrastructure will be key to help Arizona be as efficient with their water as can be. The Solar Commons is mandating that part of the YWCA's saving go to a water-harvesting job-training program. This program will teach low-income residents of Tucson the skills to become entrepreneurs in their community. I have talked with the director of the Solar Commons, Dr. Kathryn Milun, on the possibility of a Solar Commons model in the Saint Cloud area. Dr. Milun believes the project is feasible and has even agreed to work with me to develop a project. However, the biggest problem with the Solar Commons model is it's donation-based funding system. For a project that would serve the Somali community in Saint Cloud, a large donation would have to be incurred to pay for the array. Could Saint Johns be convinced to become a part of a community trust-owned solar project where Saint John's could raise funds to host a donated solar array? The savings St. John's would receive on its monthly energy bill over the next twenty years would be sent into a trust fund whose beneficiary would be a program that serves, empowers, provides job skills to the Somali community in the neighboring city of St. Cloud. As a partner in a Solar Commons, St. Johns University would be reinstating the

medieval trust responsibility that the Catholic Church once provided to the landless poor in medieval England when it served as the trustee of the agricultural commons donated by the King. In the Solar Commons model, St John's has an opportunity right in their backyard to become part of an overall student cost saving, and low-income community empowering clean energy initiative.

Cooperative Energy Futures offers several options to empower the Somali community of Saint Cloud using solar energy. One option is to use an already existing CEF solar garden just east of Saint Cloud in Sherburne County. This garden has the capacity to serve residents living in Stearns County, as well as other surrounding counties. CEF has already begun engaging with people in the Somali community of the Saint Cloud area to be apart of this project. I talked with a member of CEF's Community Power Team (who wishes to remain anonymous) about the opportunities and challenges that come with recruitment in Saint Cloud. One of the biggest obstacles so far has been "building trust within the community". In order to build trust, CEF has been engaged with community groups like the African Women's Alliance. However, despite the community connections that CEF has created, the level of trust that needs to be built for customers to understand that there is no "catch" in CEF's vision of making solar more accessible doesn't happen overnight. Saint John's was approached about serving as one of the backup subscribers to this existing garden. Saint John's is an ideal backup subscriber candidate because of the financial stability and high-energy use that they possess. Saint John's has expressed interest in joining the project in the future, but as of right now they are not a subscriber. One possible reason that Saint John's has not yet committed to a on the subscription is the distance of the garden from campus. Could a second solar garden be built if Saint John's were interested in an array of closer proximity? Cooperative Energy Futures has explored this

option as well, but this would require finding a willing landowner who has property near a three-phase power connector. This could be hard to come by in Stearns County, but if found could have great potential.

After learning about the successes of CEF's cooperative model in Minneapolis, it is my belief that a CEF solar garden in the Saint Cloud area could be a feasible option to help the Somali community. Adding Saint John's as a backup subscriber or having St. John's leverage their reputation in the community by creating a club of St John's students who work with CEF to recruit participants for CEF's existing solar garden near Stearns County are two promising steps that St. John's might take to help CEFs model gain a foothold in Stearns County on behalf of the local Somali community. In this way, St. John's would be helping address the ethical issue in emerging solar energy technologies to ensure that ethnically and regionally diverse low-income Americans are not left out of this energy boom.

As a follow up to this Lindmark study, I plan to build on my research and create a community action project as part of my senior thesis. After studying two models of community solar, I now understand that there are in fact nonprofit organizations working to solve the inequality of solar access on behalf of culturally and geographically diverse low-income communities. With the options outlined above, I will further my efforts to help the Somali community of Saint Cloud in gaining access to the benefits of solar energy.

## Appendix

### Interview Protocol

**Description of Study:** My name is Frankie Hanson and I am a rising senior at the College of Saint Benedict/Saint John's University. This summer, I am working under the Lindmark Fellowship to study the ethical issue of unequal access to the benefits of solar energy. To explore this ethical dilemma, I am creating two ethnographic case studies of two solar business models, the community trust model and the community cooperative model. My case studies will lay out the specific business model and, based on my ethnographic research, show the various ways that the model serves its specific low-income community. The findings from my case studies will be used to create a community solar business model to serve the Somali community in Saint Cloud.

#### Question Outline:

A.

- 1) Please give a brief description of your organization. How did you get started? How did you get the idea?

B.

- 2) In your words, what is "community solar"?

C.

3. I understand that your community solar business model includes low-income Americans. Can you explain to me how it does this? (What communities are served in this model?(ethic))

D.

4. What have been some of the biggest challenges that your model has run into? Legal, structural, financial, etc.

E.

5. Can you give me an example during the past two years where a low-income individual was served through your model. What are the community benefits that this specific case creates? What are the economic benefits?



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