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COMMUNITY ASSISTANTSHIP PROGRAM

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Solar Commons: Designing Community Trust Solar Ownership for Social Equity

Prepared in partnership with
The Rural Renewable Energy Alliance (RREAL).

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Table of Contents

Executive Summary	4
What are Solar Commons?	5
Proposing A Solar Commons for Northern Minnesota	7
What This Study Will Accomplish	8
Ownership Context in Current Community Solar Programs	8
Minnesota Community Solar	9
Community Solar for Low-Income Customers	10
Finding A Solution in Community Solar Trust Ownership	11
Community Land Trusts: History and Applicability to Solar Power	12
Historical Background to Community Land Trust Concept	12
The Electric Grid Connection	14
Community Trust Inspiration from Beyond the Grid and Beyond the US	15
Interviews with Community Land Trust Leaders About Solar Trust Assets	16
Minnesota Demonstration Project	18
Background on RREAL	18
Two Solar Commons Models Analyzed For RREAL	19
Future Policy Recommendations	22
Appendix A	26
Bibliography	28

Executive Summary

In the United States, the sun shines for everyone, but many are left out from the economic benefits of the renewable energy transition. Community solar, meant to provide ownership and subscription options to those without the means, often stretch the imagination in how they use the word “community.” Is an investor-owned utility that offers its customers the opportunity to subsidize the utility’s solar-generated electricity with a higher price on their electricity bill really an example of “community solar”? What do we mean when we say “community solar” in the United States today? And how can we build a model of community solar that serves low-income communities and “the common good”?

This study introduces a new model of community solar called “Solar Commons.” Solar Commons are solar energy systems that use community trust-ownership to deliver commonwealth benefits to low-income communities. Using the cultural history of community land trusts and the creative potential of trust law as a backdrop, this study demonstrates the particular progress of a Solar Commons demonstration project which the Solar Commons nonprofit proposes for the Rural Renewable Energy Alliance and the Leech Lake Band of Ojibwe.

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What are Solar Commons?

Solar Commons (SC) are solar energy systems that use **community trust-ownership** to deliver commonwealth benefits to low-income communities. Taking their name from the long tradition of “commons,” the social norm of holding agricultural fields, pastures and forests “in trust” for the subsistence needs of landless peasants in Medieval England (Linebaugh), Solar Commons hold the potential wealth in solar energy generation “in trust” for communities of need. Like their legal predecessor, the community land trust (CLT), Solar Commons set certain property aspects of solar energy outside the market so that their increasing value can be captured, held, and delivered back into local, low-income communities.¹

In their own small way, Solar Commons aim to address the twin crises of our contemporary world: social inequality and ecological devastation. These mighty aims may seem misplaced in the wires and panels of a solar array. But from an anthropological perspective, our energy systems have always been embedded in the fundamental values and customs of human societies (White). Today, the values and cultural norms that underpin our cheap and ubiquitous carbon-based energy infrastructure are out of joint with our ecological home. Solar Commons use community trust law and solar technology to reconnect the value of our energy infrastructure to social equity and ecological health. Solar Commons take an aspirational approach to solar energy. But Solar Commons also share the practical concern of all engineers and policy wonks with kilowatt-hours, inverters, installed costs, interconnection agreements, regulatory frameworks and grid access. In short, Solar Commons have to make both electrons and financial sense.

The Solar Commons model is currently being innovated and prototyped in the U.S. Because Solar Commons are an aspirational socio-technology, they must spend the first years of their American life demonstrating their value in specific jurisdictions, geographies and cultural contexts. Solar Commons aim to become standard US templates publicly and freely available for nonprofits, tribes, communities, local businesses and others to produce clean electricity AND economic benefits for those most in need in their communities. Beginning as a research project of Kathryn Milun, a legal anthropologist and professor at the University of Minnesota, Duluth, the Solar Commons concept has evolved. Milun founded the **Solar Commons nonprofit** (SC nonprofit) to develop demonstration projects that can use a variety of legal tools to craft community trust ownership that serves low-income communities. The Solar Commons nonprofit holds a Creative Commons (CC) license on the name and concept of Solar Commons so that the nonprofit can collaborate with community partners and legal advisors to prototype a variety of effective community trust strategies for this new concept of community owned solar.² The Solar Commons

¹ Solar Commons are also based on key design principles articulated by Elinor Ostrom, 2009 Nobel Laureate in Economics, whose life-long work studied the culturally, geographically, and historically diverse institutions of “commons.”

² This is a CC_By_NC_DC License viewable here: <https://creativecommons.org/licenses/by-nc-nd/3.0/> . By offering a Solar Commons community trust ownership model to RREAL, the Solar Commons nonprofit asks that RREAL work with the Solar Commons nonprofit (SC) so that any further use, changes or developments of the model that happen in negotiation with Leech Lake Band of Ojibwe (LLBO) can also be assessed by SC to make sure that the resulting use of the Solar Commons prototype is in line with SC’s criteria for its community-trust owned solar energy model. Also, at this stage of SC’s research and development, SC requests that RREAL not share the model with others without first getting permission from SC. These Creative Commons restrictions allow the Solar Commons nonprofit to collaborate freely with others in their demonstration project/prototyping process of creating workable, publicly available and freely useable models of Solar Commons community trust solar ownership.

nonprofit asks every partner for whom they craft low-income community trust legal strategies/models to work together to verify that their executed legal structure is in line with the Solar Commons concept in order to use the Solar Commons name and model.

The first Solar Commons demonstration project is a fully-funded 15-kilowatt solar system under pre-construction in Tucson, Arizona; its interconnection application has been filed with the local utility and its funding and partners are secured: the site for the solar array is the property of the nonprofit Southern Arizona YWCA (whose mission, “to end racism and empower women,” is carried out in one of the poorest districts of AZ and the US). As an incentive for its participation, the YWCA will receive an overall savings on their electricity bill of at least \$10,000. In addition, all costs of managing the solar array (insurance, operations and maintenance, administration, and inverter replacement in year ten) will be covered by the solar system revenue over the 20-year period of the trust agreement.

The beneficiaries of the Tucson Solar Commons are 1) the **Low-Income Household Energy Assistance Program (LIHEAP)** in Tucson for which the Solar Commons income stream will add a pool of funds that can serve low-income energy assistance applicants regardless of their citizenship status, a significant issue given Tucson’s proximity to the Mexican border and the restriction on traditional state-sponsored LIHEAP funds that recipients prove US citizenship; and 2) a **water harvesting job training program** that the YWCA is starting for residents of this low-income district (water harvesting is an emergent need in desert communities like Tucson which are experiencing drought, groundwater depletion, and impacts of global warming). The beneficiaries’ cash flow is small, approximately \$2,500 a year over the 20-year trust agreement. As the flagship model for the Solar Commons nonprofit, the Tucson prototype will go a long way to help refine and prove the model. Lessons learned on the Tucson Solar Commons project have been instrumental in helping us design the legal framework for what could be the first Minnesota Solar Commons initiated by RREAL and the Leech Lake Band of Ojibwe in Northern Minnesota.

In addition to its mission of building Solar Commons demonstration projects that prototype the community trust solar model, the SC nonprofit has two other goals for which it has built key institutional partnerships in **legal research** and in **public art**. Since Summer of 2016, the Solar Commons nonprofit (SC) has had a partnership with the [Vermont Law School Energy Clinic](#). The faculty and students at VLS are helping SC build the legal structures for community trust ownership of solar energy in the US on behalf of low-income communities. As part of our partnership of prototyping Solar Commons demonstration projects, VLS will help SC nonprofit create the public templates for Solar Commons so that low-income communities throughout the US may start creating unique Solar Commons that serve the needs of their local communities. The other goal of the SC nonprofit is to communicate the significance of community trust solar as a tool for ecological and social justice. Thus Solar Commons projects engage public art and local artists to make all their demonstration projects communicate to a general public a message that might otherwise remain unread in an academic journal or inscrutable in highly technical legal or industry domains. The SC nonprofit aims to “make visible” and “make public” the importance of designing and realizing “**commons solutions**” to today’s problems of ecological and economic injustice. Solar Commons, along with public trust environmental law and community land trusts, are part of the growing field of “commons solutions” to problems of social inequality and environmental degradation. (For a fuller description of the SC nonprofit’s work, see their website at <https://www.solarcommons.org/>)

Proposing A Solar Commons for Northern Minnesota

This University of Minnesota Center for Urban and Regional Affairs-sponsored study analyzes the feasibility of a Solar Commons legal structure in Northern Minnesota. It outlines two Solar Commons/community trust models for the Rural Renewable Energy Alliance (RREAL, at <https://www.rreal.org/>) which is seeking to explore how it might use these legal structures in its work to deliver a community benefit, energy assistance, to those in energy poverty on the reservation of the Leech Lake Band of Ojibwe. RREAL has been successfully working on poverty reduction through solar energy for decades in the US and in Africa. RREAL has also already created a unique model for delivering energy assistance through solar energy on the reservation, a model they call “Shared Solar Revenue.” Because RREAL and the Leech Lake Ojibwe Tribe already share a high degree of social trust after years of working together in their local community, and because their “Shared Solar Revenue” model is, for the most part, being deployed on tribal lands where federal-tribal relationships in land holding are embedded in trust law, RREAL’s model works very well to deliver low-income energy assistance to the tribe through solar energy. A Solar Commons model would not improve on the deep social trust that supports the current Shared Solar model. However, the solar array that RREAL is interested in exploring with a Solar Commons ownership structure is on RREAL’s (not the tribe’s) land and is fully owned by the nonprofit RREAL. In this case, Solar Commons may offer a more secure, scalable and iterable way for RREAL, and nonprofits like RREAL, to generate solar power and send an income stream into energy assistance and other programs serving low-income members of the tribe.

This CURA study began in late January of 2017. The process was: to create a background picture on Minnesota community solar policy that served low-income Minnesotans; to gather historical information on the community trust ownership advanced by the community land trust movement and consider its significance for community trust ownership of solar in Minnesota; to analyze the Solar Commons community trust prototyping that SC and VLS accomplished on the Arizona project during Spring semester 2107 and use it as a basis to create a Solar Commons trust model for the solar array that RREAL was building on its property in northern Minnesota; to analyze the feasibility of the trust model proposed for RREAL; to provide policy recommendations that would support Solar Commons trust ownership in the state of Minnesota.

In late February of 2017, the Solar Commons nonprofit and the Vermont Law School Energy Clinic joined RREAL to accept a Department of Energy (DoE) team award in their [Solar in Your Community Challenge](#). This funding and assistance opportunity linked RREAL’s program “Community Solar For Community Action” which is proving the feasibility and value of using solar energy to meet the energy needs of the nation-wide Low-Income Household Energy Assistance Program (LIHEAP) with the Solar Commons nonprofit’s project for low-income community trust solar ownership. The grant funds have created more opportunities for legal/technical assistance for RREAL and Solar Commons nonprofit in their respective, overlapping projects and Vermont Law School will play a larger role depending on their needs. Importantly, the already-in-place CURA sponsored feasibility study will serve the interests of the both the DoE Challenge grant and the determination of feasibility of using a Solar Commons model for RREAL.

What This Study Will Accomplish

To better understand the value of the Solar Commons community trust model proposed for RREAL, this study places the Solar Commons model in the larger context of what counts as community solar today in Minnesota. It lays out flaws in current community solar models with regard to serving low-income communities and argues that a Solar Commons/community trust-owned solar model can bring the benefits of solar energy to underserved communities left out of our current solar models. This study also offers a historical look into the legal antecedents of community trust solar: the community land trust (CLT). Through analysis of the early work to create community land trusts in the 1970s and through interviews with directors of contemporary community land trusts in Minnesota and across the United States, this study explores how the CLT model of community trust ownership might be applied to and scaled up for community solar today. There are several CLT institutions across the state of Minnesota. These nonprofit institutions, comfortable with holding trust property designed to capture and deliver benefits to low-income communities, can serve as an example for the role that RREAL might play in a community trust-owned solar initiative. Finally, this study will consider the policy implications for Solar Commons (community trust-owned solar serving low-income communities) to flourish in the state of Minnesota.

Ownership Context in Current Community Solar Programs

In the United States, community solar programs allow people who do not own their homes, possess strong credit scores, or have adequate roof space, to buy or invest in solar energy in shared solar arrays. It is estimated that more than 49% of the US population fall into this group (Feldman et al., 2015). At least 15 states and Washington D.C., have legislation authorizing shared renewable energy programs that allow individuals to aggregate and leverage their collective purchasing power to enter the field of solar ownership. Numerous other utilities, needing only state utility commission review or none at all, also offer these shared solar programs, also known as “community solar gardens.”

There are three basic models of community solar gardens operating today: utility-owned, special purpose entity-owned; and nonprofit-owned (Table 1) (Coughlin et al., 2012). Importantly, the Utility Model can diverge between utility and third party ownership. This Utility/Third Party-owned model comprises the majority of community solar capacity today.

Table 1: Comparison of Community Solar Models (Source: Coughlin et al., 2012)

	Utility	Special Purpose Entity	Nonprofit
Owned By	Utility or third party	SPE members	Nonprofit
Financed By	Utility, grants, ratepayer subscriptions	Member investments, grants, incentives	Memberships, donor contributions, grants
Hosted By	Utility or third party	Third party	Nonprofit
Subscriber Profile	Electric rate payers of the utility	Community investors	Donors, members
Subscriber Motive	Offset personal electricity use	Return on investment; offset personal electricity use	Return on investment; philanthropy
Long-term Strategy of Sponsor	Offer solar options; add solar generation (possibly for Renewable Portfolio Standard)	Sell system to host; retain for electricity production	Retain for electricity production for life of system
Examples	<ul style="list-style-type: none"> • Sacramento Municipal Utility District – SolarShares Program • Tucson Electric Power – Bright Tucson Program 	<ul style="list-style-type: none"> • University Park Community Solar, LLC • Clean Energy Collective, LLC • Island Community Solar, LLC 	<ul style="list-style-type: none"> • Winthrop Community Solar Project • Solar for Sakai

Minnesota Community Solar

In Minnesota, community solar garden programs are run entirely under the Utility Model (Institute for Local Self-Reliance, 2017). Xcel Energy, mandated under state legislation from 2013, runs the largest community solar program in the nation, with 74 megawatts constructed as of January 2017 and nearly 800 megawatts left in the queue (Xcel Energy, 2017). Xcel Energy’s program offers a value-of-solar rate to subscribers of the projects for their electricity, while developers compete to sign up subscribers to their respective gardens.

Other Minnesota electric cooperatives, mostly with solar gardens well under one megawatt in capacity, outsource their community solar programs to third parties, work in tandem with their generation and transmission cooperative or joint action agency, or simply own the array themselves. Wright-Hennepin Electric Cooperative, the first electric utility in Minnesota to open a community solar garden, worked with third party Clean Energy Collective on its 32-kilowatt array in 2012 (Clean Energy Collective, 2012). This and other cooperative- and municipally-owned solar gardens in the state fall outside state regulatory purview and require no enabling laws.

As Table 2 describes, in Minnesota, there are more than a dozen community solar programs in place today, with a handful still in development at other investor-owned, municipal, and cooperative utilities.

Table 2: Community Solar in Minnesota (Source: Clean Energy Resource Teams, 2017)

Utility Name	Utility Type	Ownership Type
Arrowhead Electric Cooperative	Cooperative	Utility

Austin Utilities	Municipal Utility	Utility
Beltrami Electric Cooperative	Cooperative	Utility
Connexus Energy	Cooperative	Utility
Crow Wing Power	Cooperative	Utility
Detroit Lakes Public Utilities	Municipal Utility	Utility
Itasca-Mantrap Co-op Electric	Cooperative	Utility
Kandiyohi Power Cooperative	Cooperative	Utility
Lake Region Electric Cooperative	Cooperative	Utility
McLeod Cooperative Power	Cooperative	Utility
Meeker Cooperative	Cooperative	Utility
Moorhead Public Service	Municipal Utility	Utility
People's Energy Cooperative	Cooperative	Utility
Redwood Electric Cooperative	Cooperative	Utility
Rochester Public Utilities	Municipal Utility	Utility
Runestone Electric Association	Cooperative	Utility
Saint Peter Municipal Utilities	Municipal Utility	Utility
South Central Electric Association	Cooperative	Utility
Stearns Coop Electric Association	Cooperative	Utility
Steele-Waseca Cooperative Electric	Cooperative	Utility
Tri-County Electric Cooperative	Cooperative	Utility
Wright-Hennepin Cooperative Electric Association	Cooperative	Utility/Third Party
Xcel Energy	Investor-owned utility	Third Party

Community Solar for Low-Income Customers

For low-income consumers, energy expenditures are twice the burden they are for the average American household, and can take up more than 20 percent of a household's monthly income (Paulos, 2017). Community solar is meant to expand the marketplace for solar, yet barriers still exist for low- to moderate-income (LMI) customers, who are barred from having an ownership stake in solar assets and benefits because of poor information, low credit scores, or inaccessible living arrangements.

Nationally, models for low-income community solar are emerging. Colorado mandated a carve out for five percent of their solar gardens to be subscribed to by low-income customers (Low-Income Solar Policy Guide, 2016). Grid Alternatives, in particular, has developed community solar gardens that offer four-year contracts (compared to the usual 20 or more) that rotate between low-income customers, on-bill financing options, and quick payback timelines (Interstate Renewable Energy Council, 2016). Other states such as California offer subsidies to subscribers with low incomes, while New York is still mulling over its low-income community energy rules.

In Minnesota, there are few explicit community solar models for low-income residents.

Currently the Minnesota Public Utilities Commission is assessing a rate incentive to community solar garden developers under Xcel Energy's program that subscribe larger portions of low-income customers, as well as directing Xcel Energy to propose its own low-income community solar garden. Cooperative Energy Futures (CEF), a Minneapolis-based, cooperatively owned entity, with the Just Community Solar Coalition, provides one example of how community solar might be built under the Xcel Energy program. CEF is currently signing up residents from diverse local neighborhoods--both high and low income--and offering subscription rates that vary based on income. This allows subscription rates for high-income solar participants ("anchor tenants") to balance out the subscription rates offered to lower-income solar participants, thus reducing risk and making developers more willing to accept customers with low credit scores (Paulos, 2017). CEF is also building one of their first solar arrays on top of a church in an ethnically diverse and historically underserved area of North Minneapolis (Cooperative Energy Futures, 2017).

Each community solar model rewards individual investment and returns, utilizing different ownership styles and financing mechanisms to deliver their product, but largely leaving the inclusion of low-income communities at the behest of the developer or state regulation. To date, no single, scalable model for LMI inclusion in community solar has emerged, though a number of policy solutions have evolved (further detailed in "Policy Recommendations" section).

Finding A Solution in Community Solar Trust Ownership

Solar Commons community trust ownership models will fill the need in US community solar programs to serve low-income communities as collective entities within the broader idea of "the common good." The mission of Solar Commons is to create, through its demonstration projects, low-income community trust models for solar energy that 1) are scalable and iterable; 2) are flexible enough to serve diverse communities and jurisdictions; 3) are different than current uses of the term "community solar" in that current use refers NOT to community benefit but rather to the benefits that accrue to individual members of a community—in a co-op or subscription ownership model. By serving local, low-income community entities, the Solar Commons is serving an enduring community collective and is helping to define the role of low-income communities in the larger concept of "the common good."

There will be several ways to achieve a Solar Commons in trust law and the demonstration projects that the SC nonprofit carries out will demonstrate the legal diversity and variety of benefits that can come to the low-income community it serves. Energy assistance is one kind of benefit; homeless shelter support,

job training programs, and even “new money/local currency” initiatives are some of the other benefits that Solar Commons can create for the collective benefit of low-income communities.

But before turning to the community solar model that SC nonprofit can propose to RREAL, it is valuable to consider how, at another time in the recent past, nonprofits in the United States rose to the occasion of solving the problem of excluding low-income communities from accessing land for homeownership. Indeed, we see the current crisis of solar access for low-income communities as comparable to the crisis that low-income communities faced in accessing land for homeownership. In both cases, community trust ownership offers a solution.

Community Land Trusts: History and Applicability to Solar Power

The problem of including low-income communities into current solar energy markets is similar to the problem of including low-income communities into urban real estate markets in the later twentieth century. In both cases, normative market practices and values made market access for low-income communities prohibitive. How did the community land trust movement solve this problem and how is it applicable to solar power today?

Historical Background to Community Land Trust Concept

In the 1960s and ‘70s, community activist advocates for the urban poor considered how a new land ownership model, the community trust, might be used in U.S. cities. Philosophically, the early land trust theorists saw their work in the tradition of Native Americans who took a stewardship approach to land use. They saw themselves as “restoring the land trust concept rather than initiating it” (International, xiii). These advocates also highlighted their connection to the American political economist Henry George. At the turn of the twentieth century and the beginning of the progressive era, George’s best-selling book *Progress and Poverty* argued that all wealth derived from land. George maintained that the pattern of private land ownership and its related tax policies encouraged land speculation, a social behavior that George placed at the root of economic inflation and unequal distribution of wealth (George). Inflated land values and a tax system that discouraged improvements were also at the heart of the urban housing crisis that community land trust (CLT) advocates sought to solve with a trusteeship approach to land use. Also building on the work of Ralph Borsodi, CLT theorists emphasized that possessions be distinguished between *property* and *trusterty*: “Property is created by man (sic) through his labor. Trusterty 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.”

In their first publication on the community land trust concept in 1972, Robert Swann and his associates described several kinds of institutions that functioned in the contemporary US with the idea of “trusterty.” These included rural New Towns, Indian Tribal Lands, Mexican-American Claims, Alaskan Land Claims, Hutterite Communities, Tax Enclaves and others (International 18-29). Because the concept could be realized with such great cultural and geographic diversity, the authors found that they were describing “prototypes” rather than instances of community land trusts. What the authors were after was the function of holding land in trust in perpetuity in order to create secure “user rights” to the land through long-term

leases. User rights allowed land trust leases to make and own their own “improvements” on the land though building houses, gardens, small local businesses, among other things. Indeed, CLT advocates distinguished between the land with its natural resources and the human improvements made on the land (often called externalities): “The land is held in trust, not the improvements. Homes, stores, and industrial enterprises created by the residents [of a community land trust] will be owned by them either cooperatively or individually” (International, 18). Importantly, the mid-twentieth century CLT activists saw the land trust concept as not primarily concerned with *common ownership* but rather with “*ownership for the common good*” (17).

These key characteristics of trust ownership (institutional prototyping, user rights, individual and collective ownership of the “improvements,” and ownership for the common good) are all elements that have gone into applying the history and theory of community land trusts to the Solar Commons concept of community trust solar.

Over the past fifty years, with diligent work by community activists, creative homeowners, legal advocates and progressive legislators, the community land trust concept has evolved into a stable American institution with national legal standards for trust ownership and innovative urban organizations that continue to evolve the model in cities across the US. Below (Figure 1) is a diagram of how the community land trust captures the economic appreciation of land and building structures and holds these values to create common good benefits to low-income communities and their individual homeowners.

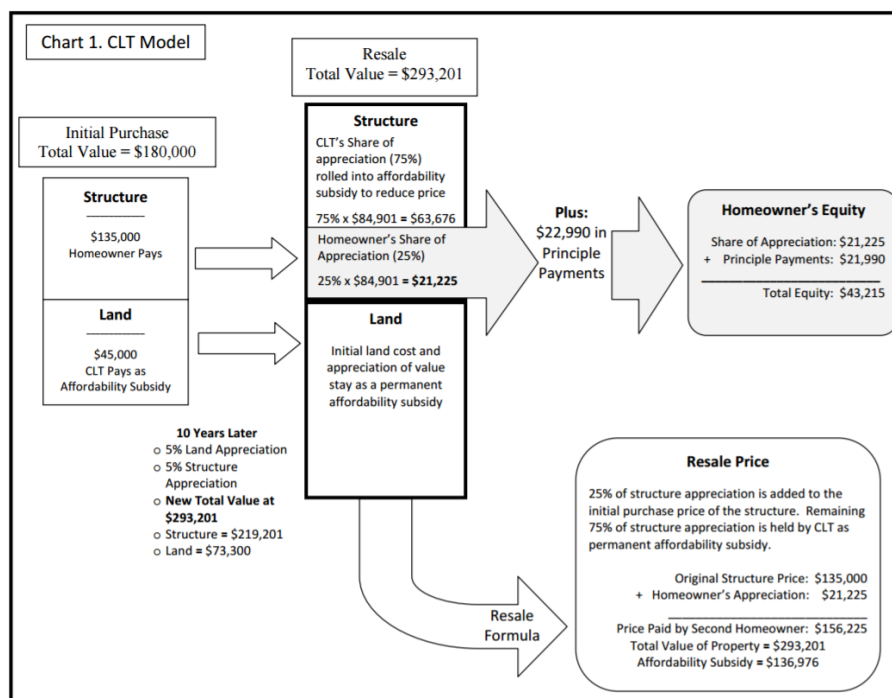


Figure 1: A hypothetical and typical cash-flow model of a community land trust (Source: Petersen, 2010)

The Electric Grid Connection

While community land trusts are designed to retain subsidy and affordability by separating the land from market pressures, restricting resale, and sharing appreciation, it can be seen in Figure 2 how electricity rates mimic the rising market costs of housing. In this way, distributed, renewable energy that is high on the upfront cost but low in continued operations and maintenance costs, can provide a long-term hedge against the rising costs of grid electricity.

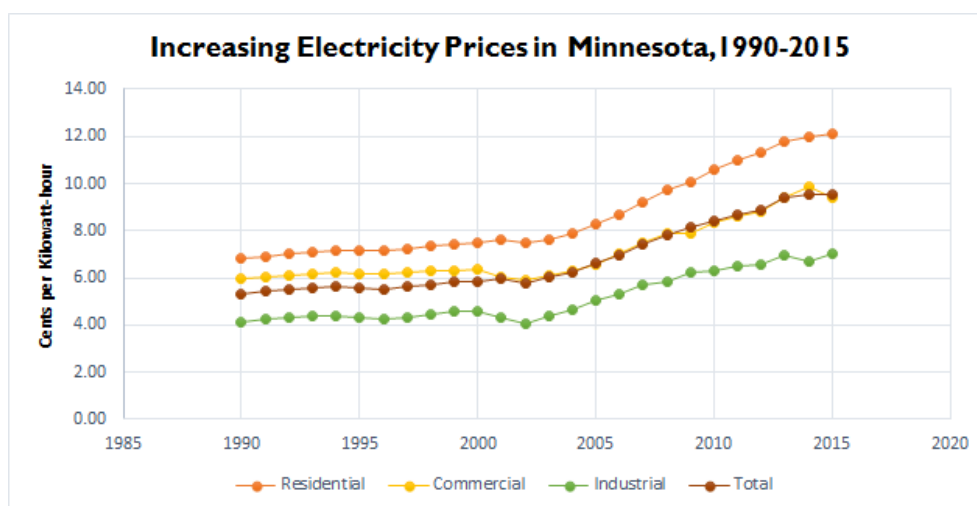


Figure 2: Residential rates increased at an average of 2.4 percent from 1990 to 2015, outpacing commercial and industrial sectors, who saw their rates increase on average by 1.89 percent and 2.21 percent (Source: U.S. Energy Information Administration, 2016)

As the costs of the grid and stranded fossil fuel-fired power plants continue to increase, as they have historically in Figure 2, the value of avoiding those costs will also appreciate. Take, for example, Minnesota Power's calculated value-of-solar rate, representing the avoided energy, environmental, and social costs of distributed solar within its territory (Minnesota Power, 2017). Though it leaves out more intangible and tangible values such as distributed ownership and indirect economic benefits, Minnesota Power provides 12.6 cents per kilowatt-hour as the numeric value that solar energy provides over its lifetime.

This value will rise over its lifetime, in some spots more than others, owing to the physical interconnectedness and needs of the electric grid and its consumers. Who gets a share of that value is partially determined by the utility, regulators, legislators, but little by actual utility customers, their communities, and their needs for more renewable electricity or lower electric bills.

It is clear that current electricity markets display social equity and user/customer-rights issues that are similar to what the early community land trust advocates sought to remedy in the mid-twentieth century housing markets by commoditizing land and placing it in community trust. The additional challenge of adding renewable electricity to a grid whose monopoly ownership structure is not yet capable of addressing the issue of stranded fossil-fuel assets presents a further reason for finding an ownership

solution that can address both grid user rights and current market failure. Can the community land trust model help us address these challenges?

Community Trust Inspiration from Beyond the Grid and Beyond the US

The Solar Commons nonprofit has found inspiration for its community trust solar work from certain rural areas in India where electrification is now coming to remote tribal communities in the form of solar microgrids that are being owned as “village trust” property. The village trust model for solar comes from a much longer tradition of land stewardship that, not surprisingly, turns out to be one of the key influences of Robert Swann and the early U.S. community land trust advocates noted above.

In the Indian context, the village trust ownership model evolved from Gandhi’s work to secure equitable land allocations to small farmers who had been excluded from land ownership under previous power regimes (Gandhi). In postcolonial India, Gandhi saw that land that had been broken out and redistributed from large estates to create small farm plots was being grabbed up by land speculators who swooped into rural communities and offered farmers money for their new plots. Quickly, large and remotely owned monopoly estates were once again growing around the countryside, siphoning off into market speculation the value of lands worked by local farmers. Gandhi’s solution to the problem of land speculation was to purchase the land back from the estate owners and place it in village trust ownership. At the local level, village trustees could make appropriate rules for leasing village trust lands to local farmers. The new village trust rules created access for families to work land for their own livelihood, to reap the full reward of their labor, and to pass on the land and the improvements made on the land to the farmers’ children. The additional values that village trust land brought to the local community—long term stability for farmers and increased prosperity for the local economy—are collective benefits enjoyed by the whole community. By owning land as a village trust, the land became a common good managed by local rules that built social trust for the community.

In India today, principles of village trust ownership are being applied to solar energy in remote, newly electrified tribal villages. In several Indian villages studied by Milun and the Solar Commons research initiative, nongovernmental organizations with a mission to empower women have offered to donate solar microgrids as long as villagers agree to allow fifty percent of the village solar trustees to be women. In areas where women have traditionally been barred from owning property or taking leadership roles in village governance, village trust solar is becoming a vehicle for social change.



Figure 3: “Village Trust Solar,” a painting commissioned by the Solar Commons nonprofit from local Warli art cooperative in Maharashtra, India. The painting uses the ancient Warli art form to depict the combined technical and social infrastructure of village trust solar. (Source: <https://www.solarcommons.org/>.)

Can the solar microgrids that are now showing up in US cities be inspired by the village trust ownership model that is **furthering social equity** in remote Indian villages? Can community trust ownership be used to **remove aspects of solar energy from market values that have been skewed by stranded fossil-fuel assets**?

It is not surprising that in the first book written on the community land trust concept in the US in 1972, author Robert Swann noted his own inspiration coming from the Gandhian village trust model. After his work on the CLT movement, Swann went on to become the founder of the E. F. Schumacher Society, which today is known as the [New Economy Coalition](#). The Solar Commons model aspires to stand in the legacy of these great community trust innovators as it prototypes community solar trust ownership for low-income communities in the US today. As a new model for community solar, Solar Commons aims to prove that **user-rights, social equity, and ecological values** can be better designed to suit the potential of distributed solar technology by experimenting with community trust ownership.

Interviews with Community Land Trust Leaders About Solar Trust Assets

In interviews with twenty-two directors or employees of community land trusts across the nation (shown in Figure 4), we found that many land trusts had thought about renewable energy, but few had incorporated it into individual structures, let alone their trust holdings. These community land trusts largely reflected local and state policy, politics, and culture to determine how they used or generated their energy. And asked to imagine how to incorporate renewable energy into their trusts or structures, many struggled, relying on already-present conventions, claiming a lack of knowledge. A few, though, had thought about the potential closer to the point of implementation.

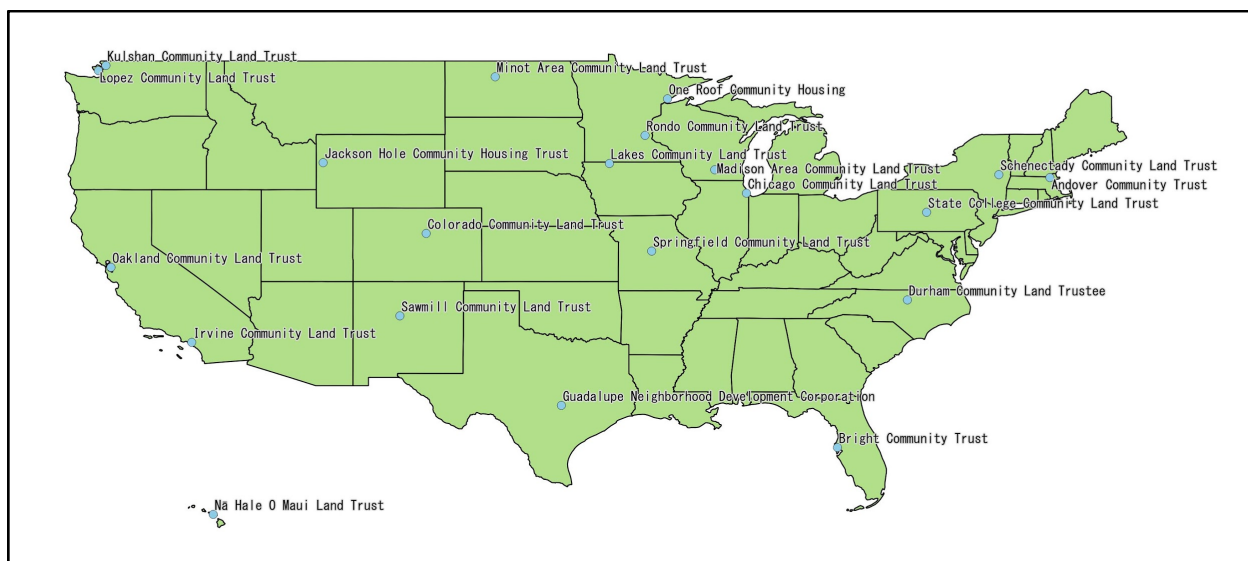


Figure 4: Names and locations of community land trusts interviewed

In places such as out West, unpredictable weather and politics could derail solar. In many others, it was the upfront cost: they had no idea what the cost or the risk was, let alone a method of financing or a way to get the money for it. The few who had incorporated solar in their buildings or trusts still imagined it proceeding through third parties such as SolarCity, or through individual homeowners owning in on top of land in trust. One land trust proposed a net-zero home to see how the banks would accept it into their secondary market portfolios. Community land trusts, with few employees and straining for funds, were by-and-large focused on getting people into homes first; if there was money for more, solar was an option. It was first about housing.

A few were more experienced with thinking about solar energy. Some mentioned creating low-interest revolving loans for solar. In places such as Washington, where the state officially created a feed-in tariff (a higher level of reimbursement for solar energy production), the case for solar was spurred through individual donations and utilities willing to work with the land trusts. Other solar projects were owned by Austin Energy in Texas and placed on land trust homes; the homeowners were then compensated for their energy, and the solar panels will be donated to the land trust at the end of the utility's project. Other land trusts depended heavily on local nonprofits to spur solar power innovation in their land trusts, either going outright against third-party solar policies in North Carolina, or seeking cooperative ownership models in the case of Oakland to spread solar in the properties.

Eleven out of twenty-two interviewees had at least one property with solar on it; three of those seemed to be held in the trust itself. While thirteen wanted to add more solar, there were only two community land trusts that were thinking about holding that solar in trust. One local land trust in Northern Minnesota observed that, if they were offered a way to hold either donated or reasonably financed solar assets in trust, they would be more than happy to do so.

To date, policies and regulations aren't keeping up with the imaginative front and vice-versa. But just as in the 1970s when the community land trust model first emerged, community solar and its kin have seeds

of ideas around the country, represented by nascent ideas of what energy is, should, and could be. The CLT folks we interviewed convinced us that solar energy could be managed by nonprofits as community trusts.

Minnesota Demonstration Project

In 2017, the Solar Commons nonprofit and the Rural Renewable Energy Alliance (RREAL) began a CURA-sponsored inquiry into whether a Solar Commons model of community trust ownership would work for RREAL's organization.

Background on RREAL

RREAL started its mission in 2000, as a nonprofit to alleviate energy poverty through solar energy. Normally, the federal Low-Income Home Energy Assistance Program (LIHEAP) will help pay bills of low-income residents. RREAL sees solar as a way to help generate a return on investment for LIHEAP participants, instead of just paying utilities for fossil fueled-energy.

After installing hundreds of solar arrays, RREAL is now turning to community solar. This project began in 2014 with a grant application to the Legislative Citizen Commission on Minnesota Resources (LCCMR), which is responsible for distributing funds from the Environment and Natural Resources Trust Fund every year (Rural Renewable Energy Alliance, 2016). RREAL wrote a grant with the Leech Lake Band of Ojibwe, and was awarded it in late 2015.

RREAL intends to use the money to deploy 200 kilowatts of net metered-solar on behalf of the Leech Lake Band of Ojibwe Energy Assistance Program. The Energy Assistance Program will determine which families get to subscribe to the array on an annual basis, based on the families' respective needs. The first 40 kilowatts, built already, served as a demonstration for simply giving net-metered revenue to the tribal Energy Assistance Program. Other than the 40-kilowatt array under consideration as a Solar Commons project, the remaining kilowatts will be deployed on the reservation.

RREAL ended up developing something similar to a solar trust model, what they called "Shared Solar Revenue." The array and the ensuing revenue from the original 40-kilowatt solar array were donated to the Tribe with the condition that the revenue be given to the local Energy Assistance Program. RREAL plans to use this model for 120 kilowatts of the remaining 160.

RREAL is interested in seeing whether the final 40 kilowatts built off reservations on land owned by RREAL could utilize a Solar Commons model. RREAL recognizes that organizing a community solar array as a trust would allow it to operate community solar under any regulatory regime.

Because RREAL and the Tribe already share a high degree of social trust after years of working together in their community, and because their "Shared Solar Revenue" model is, for the most part, being deployed on tribal lands where federal-tribal relationships in land-holding are embedded in trust law, RREAL's model works well to deliver low-income energy assistance to the tribe through solar energy. A Solar Commons model would not improve on the deep social trust that supports the current Shared Solar model.

However, the solar array that RREAL is interested in exploring with a Solar Commons ownership structure is on RREAL's (and not the tribe's) land and is fully owned by the nonprofit. In this case, Solar Commons may offer a more secure, scalable and iterable way for RREAL, and nonprofits like RREAL, to generate solar power and send an income stream into energy assistance and other programs serving low-income members of the tribe.

Two Solar Commons Models Analyzed For RREAL

Solar Commons nonprofit explored two community trust models for RREAL's 40-kilowatt array. Both models take the solar-generated revenue stream out of the electricity marketplace, lock it into a secure price for a specified period, and capture and keep local additional values that serve the broader "common good." Both models make the low-income community, the Leech Lake Band of Ojibwe (LLBO) the principle owner of the solar energy benefits. Table 3 shows the system cash flow analysis of revenue to the trust and income to the low-income beneficiary for the suggested trust escrow model, Model 2.

Table 3: Solar Commons Cash-flow Analysis Assumptions and Results for Trust Escrow Model

Hardware, Design, and Installation	Donated
Legal	\$2500
Administration	\$100/year, increasing 2% yearly
Operations and Maintenance	Donated (used as training opportunity)
Insurance	\$200/year, increasing 2% yearly
Inverter Replacement	\$750/year for first 10 years
Utility Reimbursement Rate	\$.09/kWh, increasing 1% yearly
Solar Capacity Factor	13.9%
Array size	40 kW-DC
Inflation Rate	3%
Discount Rate	3%
20-year NPV for Beneficiary	\$39,846

Model 1) Charitable Trust: This model would have placed the solar asset itself in a charitable trust whose beneficiary was the Leech Lake Tribe of Ojibwe's (LLBO) Energy Assistance Program and whose a trustee was RREAL. In Arizona, using this model would have required several contracts, which, if used to transfer the solar hardware into a trust in Minnesota, would add significant legal costs:

- **Asset Transfer Agreement** (from RREAL, the current owner of the array, to the trust)
- **Power Purchase Agreement** (between the SC Charitable Trust and RREAL)
- **Site Lease Agreement** (between the SC Charitable trust and the nonprofit trustee RREAL.)

This model uses several features of the community land trust model that places land (real property) in trust and creates a role for a nonprofit as trustee of the asset. A solar array, however, is not considered “real property” in US law; it is ownable as “personal property” and therefore comes under different legal constraints in trust law. Basically, this model would have created a situation whereby the (nonprofit) trust was selling electricity behind RREAL’s meter to RREAL (the nonprofit trustee). The arrangement would have set up one of **the key legal problems of this model: self-dealing**. Until this problem is resolved, it presents a fatal flaw in the model and the Solar Commons nonprofit cannot recommend it. Other aspects of the model fit the Solar Commons design features and the aims of RREAL and the Tribe: as the trustee, RREAL would have been obligated by the terms of the trust to use the revenue stream from net-metered savings on its electricity bill to pay for the cost of the asset’s insurance and operation and maintenance. The remainder would have become the income stream belonging to the trust’s beneficiary, the Leech Lake Band of Ojibwe’s Energy Assistance Program. RREAL would have been responsible for sending that income stream to the tribe on a regular timetable that RREAL (trustee) and the Tribe (Beneficiary) would have agreed to. The terms of the trust (as negotiated and agreed to by RREAL and the Tribe) would have established security and overview for the Tribe’s ownership stake in the revenue benefits of the solar trust asset.

Solar Commons nonprofit and the Vermont Law School (VLS) Energy Clinic worked on the charitable trust model and found several insurmountable problems that made the model not yet suitable for RREAL. As already noted, the issue of self-dealing due the fact that the trustee would be contracting with itself to purchase electricity. Additional weakness of the model included: legal complexities in the agreements needed to make the trust operate as a trust; **unknown costs of administering the annual tax filings** that, due to electricity sales between the trust and trustee, created transactional complexities. Given the small amount of yearly income the 40kW system can deliver to the Tribe’s energy assistance program under MN Power net-metering rules, additional administrative costs to the trustee could be significant losses for the Tribe.

The Vermont Law School Energy Clinic is going to continue exploring the Charitable Trust option to see if it can be simplified and its problems solved for use in Minnesota. If it can be simplified, the SC nonprofit might propose its eventual use. In this eventuality, SC nonprofit suggests that RREAL create an assignment clause in whatever agreement RREAL has with the LLBO so that the trust relationship it has with the Tribe can be reassigned to the charitable trust if needed.

As it currently exists, Solar Commons nonprofit cannot recommend the Charitable Trust model to RREAL as a viable, iterable, scalable SC model.

Model 2) Trust Escrow: The trust escrow arrangement offers an elegant solution to the problems raised by the Charitable Trust and has the additional benefit of not needing complex legal agreements to be set up.

This trust arrangement can be made with a simple escrow trust agreement arranged at a local Community Development Financial Institution (CDFI). CDFIs exist in every state and, as nonprofit organizations, share an overlapping mission with both RREAL and the Solar Commons trust model which is to serve local low-income communities. The trust escrow model is also scalable, iterable and meets the criteria

that the Solar Commons nonprofit needs to meet in all its demonstration project/prototypes. The trust escrow agreement would be signed by RREAL and the LLBO. It would be administered by the CDFI based on oversight rules agreeable to all parties. Solar Commons nonprofit also recommends that the trust escrow hold a **security interest** in the solar array's LLOB benefits. The security interest filing would be made with the state of Minnesota (or with a comparable tribal or federal entity). The trust escrow agreement would also note a **reversionary interest** that RREAL would have in moving the trust escrow arrangement into a charitable trust should that legal form be created in a way that provided more benefits and security to RREAL and LLBO.

Solar Commons nonprofit presented RREAL (see email of June 10) **with a protocol that lays out the terms of the trust escrow agreement** and invited RREAL and its lawyers to participate in the further design that VLS and SC nonprofit engaged in during the month of June to create the actual escrow trust agreement. In order to ensure that criteria of community trust ownership, scalability and iterability were met in the model, SC nonprofit engaged a MN lawyer to work with the SC nonprofit, VLS, RREAL, and LLBO to design a workable trust agreement document that could be the basis of further negotiation between RREAL and LLBO. As of the June 30th completion of this feasibility study, SC nonprofit has not heard from RREAL concerning these arrangements. If RREAL decides to move forward on the Solar Commons trust escrow model, the Solar Commons nonprofit would use its legal team to work with RREAL to complete a draft of the escrow trust agreement for RREAL's further review.

SC nonprofit recommends that RREAL work with SC to complete a Solar Commons escrow trust model for the 40kW array on its property for the benefit of LLBO energy assistance program. SC finds that this arrangement offers significant security for the beneficiary and incentive for RREAL and its nonprofit mission. Furthermore, this model is iterable, scalable and affordable. It would create an impactful Solar Commons prototype in RREAL's portfolio. SC would continue to work with RREAL to add public art features that would make the Solar Commons arrangement visible to all. As always, the SC community partners--RREAL and the LLBO--would be invited to negotiate the Solar Commons prototype trust escrow agreement with SC nonprofit until they found a design that worked for them.

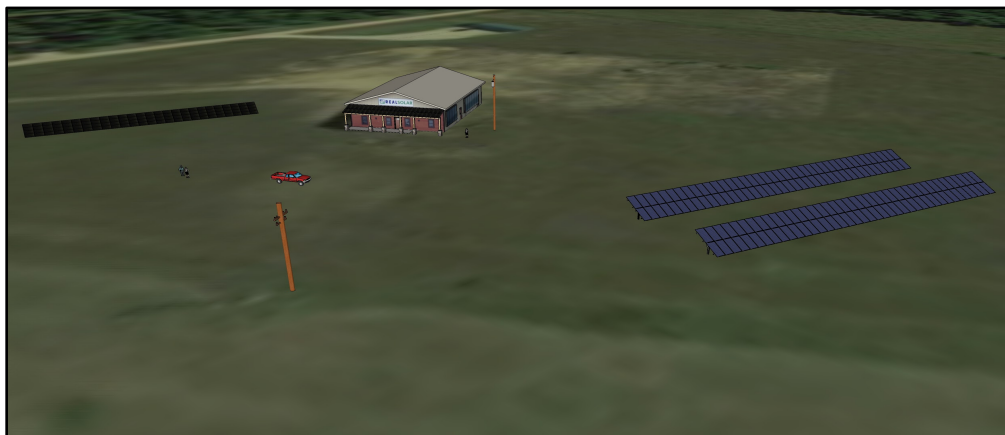


Figure 5: Representation of the 40-kilowatt solar array at RREAL's headquarters under consideration as Minnesota's first Solar Commons.

Future Policy Recommendations

Expanding on the community land trust model, a community-trust Solar Commons can generate community-based revenue for low-income beneficiaries. The following policies can be important to the functioning of a Solar Commons in Minnesota and elsewhere in the US.

Energy Reimbursement Rules

Net metering rules currently limit projects in Minnesota to receive retail rates (8 to 11 cents per kilowatt-hour of energy) and in size up to 40 kilowatts in size. The Minnesota Legislature raised the cap on net metering to 1,000 kilowatts in 2013, but allowed utilities to recover costs for maintaining their system, thereby lowering the reimbursement rate. The particulars of the state's net metering policy are still being debated before the Minnesota Public Utilities Commission.

While the Solar Commons model generates income for the beneficiary via a trust mechanism, it does need adequate reimbursement rates for the project to make economic sense. To fully account for the energy, environmental, and social costs that local solar energy avoids with its production, the State of Minnesota already allows a "Value of Solar" reimbursement rate for any utility, though specifically mandated for Xcel Energy's community solar garden program. The levelized value of solar in Xcel Energy territory in early 2017 was 12.75 cents per kilowatt-hour (Xcel Energy, Sept. 2016). Using the same methodology as Xcel Energy, Minnesota Power found a value of 12.6 cents per kilowatt-hour for distributed solar (Minnesota Power, 2017). In both cases, the value-of-solar rates are similar to if not exceeding the utilities' retail rates, suggesting that distributed solar could be paid at a higher rate than current net metering rules allow without driving other customers' rates up. (RREAL, for example, is only receiving 9 cents per kilowatt-hour in the above SC model proposed in this study. If it were to receive the 12.6 cents that MN Power calculated using Minnesota's Value of Solar reimbursement rate, the Leech Lake Band of Ojibwe would receive approximately \$16,000 MORE for its low-income energy assistance program.)

To fully benefit from solar, Minnesota might calculate value-of-solar rates for remaining utility territories, fairly accounting for the benefits and costs, temporally and spatially, of distributed solar throughout the electric grid. The state could also expand the 40 kilowatt limit to 1000 kilowatts for all utilities, allowing solar projects to take advantage of economies-of-scale where necessary. (RREAL's initial plan for the LCCMR-donated 200 kilowatt array was to site all 200 kilowatts together to capture the economy of scale. Breaking up the project to meet Minnesota Power's 40kW restriction has also cost the project's low-income beneficiaries significant income.) Finally, in Xcel Energy's territory, where a solar array may not produce more than 120 percent of annual onsite energy usage at the energy, that limit might be reconsidered to allow for maximum economic feasibility of a Solar Commons.

Low-income solar policies

There are many policy tools to provide access to economic benefits and decision-making abilities with clean energy development (see Paulos, 2017 for a wide breadth of answers here). They vary from financing mechanisms to specific programs.

The subject of this case study relies on donated panels, but for future Solar Commons, **financing** may be essential to the affordability of the array. A few financing policies stand out:

- *Tariffed on-bill repayment* allows costs incurred on energy efficiency or distributed energy expenditures to be repaid back on the monthly electric bill, sometimes at a rate lower than total energy savings. Though utilities are hesitant to enter the banking industry, tariffed on-bill repayment can use electric bill history and disconnection as proxies for credit-worthiness, eliminating concerns about credit scores that currently limit low-income participation in community and third-party solar.
- *Property-assessed Clean Energy (PACE)* financing allows homeowners to repay energy investments on their property taxes. The upfront money is supported via a local government and third-party funders. It can be used by multifamily, commercial, and residential building owners. PACE financing can be used for Solar Commons projects to finance solar deployment on multifamily housing or by nonprofits that serve low-income communities or homes owned by low-income residents (Paulos, 2017).

Third-party solar may be useful in a Solar Commons model, even though it is not used in this case study. Though not explicitly legal in Minnesota, it is used here and in at least 26 other states (North Carolina Clean Energy Technology Center, 2017). The ability to take advantage of federal and state tax credits and depreciation could prove useful in the short-term while renewable energy costs decline to an amount where Tax subsidy isn't needed anymore. For community nonprofits, accessing those tax credits can mean the life of an energy project. (In an earlier version of the Arizona Solar Commons prototype, the Solar Commons trust designed a partnership with their solar design/build company to create an LLC that could capture the 30% federal tax incentive thereby lowering the cost for the nonprofit Solar Commons trust and bringing more benefits to the low-income community partners. For this model, Solar Commons was working in a jurisdiction with lower rates for solar electricity and the LLC partnership was indeed the lifeline for the energy project.)

Rights-of-way (for Solar Commoners)

A commons depends on equal access to shared infrastructure. The sun shines for everyone and rights-of-way are part of the access strategy for current solar energy infrastructure in the US. To share in the sun's common gift of solar energy, current solar users ("solar commoners") need access to the shared electric grid. Rights-of-way are thus a common pool resource and solar commoners have access rights that cannot be taken from them without just compensation. However, distribution grids in the U.S. are predominantly owned by utility companies who negotiate **exclusive** right-of-way leases (franchises) from cities, counties, state, and federal entities without including the interests of solar commoners. The right-of-way value charged by government entities has not kept up with the real value of the grid right-of-way in an era of new, distributed clean energy technologies such as solar photovoltaics. Solar Commoners—i.e. RREAL, Tribal Governments, rooftop solar owners, and others--should be at the table negotiating their stake in the right-of-way that is being exclusively leased to local utilities in grid agreements with city and state governments.

Current grid lease agreements rarely mention this full value of the solar commoner's citizen right-of-way access and how that would be reflected in the rent charged to utilities for taking exclusive use of the citizens' right-of-way with their private distribution grids. On the other hand, utilities do understand that these new solar technologies are creating greater costs in their grid maintenance and they are thus in the process of monetizing this additional grid cost to solar energy producers in the form of additional fees on

their monthly electric bill. But the US has not yet seen sufficient assessment of the value of right-of-way to solar commoners who access the sun's energy potential. **What is the value of a solar commoner's access to right-of-way for solar energy production?** Alternatively, what is the cost to a utility franchise of excluding solar commoners' from accessing their right?

From a Solar Commons perspective, government entities could act on behalf of the "commoners" who might benefit from access to the same right-of-way currently being leased exclusively for distributing fossil fuel-generated electricity. The value of a commoner's right to access right-of-way for solar might, for example, be the same as the cost that utilities charge to grid-connected, solar rooftop owners in their monthly "fees." Or, the value of a commoner's solar right-of-way access might be calculated into a "feed-in-tariff" or into a "value of solar" reimbursement rate paid to solar producers. There are many opportunities to add these new access values/costs into the lease agreements that cities, counties and others have with grid owners (who are often the same entity as the local investor-owned utility). This could be done in such a way that rooftop and third party solar producers could safely lock into their twenty-year power purchase agreements without risk of seeing new solar fees appear on their monthly, net-metered electric bills. Any increase in fees that a utility charged on a solar producer's bill would be offset by the increase that a city or government entity would charge the franchise for leasing a solar commoner's share of the right-of-way to the utility. Such a policy would create for the solar energy producer the same cost stability that the utility owner is seeking by raising solar grid fees (Milun).

There are other ways in which a *solar commoners'* perspective might lead to new policies for how right-of-way is managed by cities and others with regard to distributed renewable energy. In the case of Minnesota's solar resources, a well-managed commons could incentivize solar generation. However, incumbent utilities and regulations often forbid entities other than regulated utilities to produce electricity across public rights-of-way, restricting solar energy production to one building at a time.

The key issues here may be **how an "electric utility" is defined and regulated, as well as how the utility's franchise is given or regulated** (Grimley and Farrell, 2016).

Third-party solar laws implicitly or explicitly work around the definition of a "utility" to allow third-parties other than a regulated utility to sell electricity to customers. We could improve this policy by working on a broader definition of how many customers a third-party could serve before it is deemed a utility: for instance, in Minnesota, an entity is not regulated as a public utility if it serves 25 or fewer electric customers, perhaps opening the way up for creative microgrid and renewable energy solutions to community energy needs.

The franchise governs both the utility's monopoly territory and its particular agreements with cities to provide electric service within the municipal boundaries. To sell electricity from one building to another would necessarily violate the utilities' franchises. A true commons needs rules for not only how a customer interfaces with the utility, but also how customers can interface with each when it comes to buying and selling electricity for public goods. If, for example, solar commoners functioned as individual solar producers or as trustees of community trust-owned solar systems, they could use block-chain technologies to securely sell electricity to adjacent buildings, crossing a franchise owner's exclusive right-of-way only by paying an added fee to the franchise owner. As noted above, if the right-of-way was

considered a commons, solar commoners would also be charging a fee from the franchise owner for giving over their new, technology-enabled right to produce distributed solar. In one great bureaucratic irrationality, these franchise fees and the solar commoner fees could cancel each other out thus joining the set of irrational bureaucratic rules that utility owners are placing on solar producers during this transitional stage from a centralized, monopoly electricity sector to a distributed and localized electricity production sector.

Trust Policies

Because trust law exists at the state level, Solar Commons community trust ownership models must be adjusted for each state. Solar Commons will be seeking the same kind of standard trust code provisions that the community land trust movement was able to create during the 1990s as they created a nationally workable model for urban land trusts. This trust policy work is part of the project that the Solar Commons nonprofit is working on with the Vermont Law School Energy Clinic.

Conclusion

Solar Commons are a new ownership model for solar energy in the US. Using community trust ownership strategies on behalf of low-income communities, Solar Commons provide a unique opportunity to serve communities of need who have, for most part, been excluded from the benefits of solar energy. Over the next years, the Solar Commons nonprofit (a northern Minnesota-based nonprofit) will be building demonstration projects to prototype the Solar Commons model. In addition to shaping the community trust legal tools so that communities across Minnesota and the US can eventually build their own Solar Commons, the SC nonprofit aims to use public art to “make visible” and “make public” this model of community-owned solar for “the common good”—educating the general public about the potential for solar energy to serve both social and ecological justice. The SC demonstration projects will also contribute to policy recommendations that will help Minnesota and other states address the current problem of excluding low-income Americans from enjoying the commonwealth benefits of solar energy.

This feasibility study, with the generous research assistant support of the University of Minnesota Center for Urban and Regional Affairs (CURA), has introduced the concept, model, and potential of Solar Commons to the Rural Renewable Energy Alliance (RREAL) and to citizens of Minnesota. It has analyzed two potential Solar Commons trust ownership strategies and recommended one, the trust escrow model. In the process of doing this study, the Solar Commons nonprofit has created a term sheet proposal for RREAL and the Leech Lake Band of Ojibwe to engage with the SC nonprofit and its legal team to draft an escrow trust agreement that would be useful to deliver solar energy benefits from RREAL’s 40 kW array to the LLBO’s Energy Assistant Program with a level of security, iterability and scalability that meet the Solar Commons criteria. The Solar Commons nonprofit would be honored to continue to work

with and on behalf of RREAL and the Tribe in this endeavor. If RREAL chooses to work with a Solar Commons model, it would be prototyping the state's first Solar Commons and helping to articulate the value of the model for other solar producers, for tribes, and for low-income communities throughout Minnesota. The SC nonprofit would also secure funds and work with RREAL to include signage, informational graphics, and a public art dimension that would further communicate the social and ecological value of the Solar Commons model.

Appendix A

Community Land Trust (CLT) Interview Protocol

By Kathryn Milun, Ph.D.
For use by Matt Grimley

Description of Study: I am a graduate assistant working for Prof. Kathryn Milun, an anthropologist at the University of Minnesota. Prof. Milun is creating a community solar model called the **Solar Commons** that uses community trust ownership for low-income neighborhoods. We are interviewing directors of community land trusts across the country to gauge whether they think solar energy assets—electricity-generating photovoltaic solar panels—can become part of CLT property. Prof. Milun may wish to followup my brief interview to ask you some further questions if that is OK with you. This interview will take less than 10 minutes.

Please feel free to let me know whether you are comfortable with my using your name in my book or report.

Interviewee Background	
Name Position CLT Name: Web Address: Location—operating boundaries Mission: Size—how is this measured? <ul style="list-style-type: none"> ● Acres of land in trust? ● number of houses on trust land? ● Number of activities/services the land trust operates? ● Income of people/households served by CLT? 	

1. Is it OK if I record this conversation?

Trust Property: role of trustee

1. What kinds of property does your CLT own? (buildings, land, construction company, tools--exchange service, etc)
2. What kind of property does the CLT own in trust?
3. Who are the beneficiaries of the trust?
4. Generally speaking, what are the responsibilities of trust ownership? ---or, how is trust ownership different than other ways you own property? (Governance structure)

Adding Solar Arrays to CLT Property

1. Do you know of any CLTs that own solar arrays (as part of their trust property)?
 - a. If so, what are the circumstances---governance—and how is it working out for them?
2. Have you ever thought of adding solar arrays (or renewable energy) to your trust properties?
3. If you did add solar to your CLT, how do you imagine it would work? (ownership structure, effectiveness, etc)

Interview Follow up

1. Would you mind if Prof. Milun called you with any follow up questions?
2. Please feel free to let me know whether you are comfortable with my using your name in a book or report.

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