BRINGING NEW LIGHT TO ONE OF THE OLDEST FORMS OF PROPERTY OWNERSHIP: AN INNOVATIVE SOLUTION FOR BENEFITTING UNDERSERVED COMMUNITIES USING THE SOLAR COMMONS COMMUNITY TRUST MODEL

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ABSTRACT

This Article presents a new ownership model for distributed solar energy in the United States: the Solar Commons Community Trust Model (SCCTM). Designed and realized by the authors, the SCCTM uses trust law to create an ownership vehicle to hold solar energy assets and distribute their benefits to low-income communities. The Solar Commons model is contrasted with current "community solar" models, which pass on to individual households the monetary savings from a remotely located solar energy array. The SCCTM passes the solar energy savings of a remotely located solar energy array into a Solar Commons trust and makes those trust funds into a "common good" benefiting a whole community through the charitable purposes of the Solar Commons trust agreement. This Article lays out the practical steps of creating low-income community benefits using the SCCTM. We address legal ramifications and policy barriers that can be overcome, drawing on details of Solar Commons prototypes designed by the authors in Arizona and Minnesota. This Article also describes how the SCCTM fits into the historical framework of trust law as a tool of legal reform thanks to the use of trusts as practical solutions to equity issues arising in dominant property regimes. Based on the historical evolution of trust law, this Article evaluates why features of trust ownership such as equitable title, fiduciary duty to beneficiaries, trust protectorship, and intergenerational equity are appropriate tools for solving equity issues facing 21st-century technology and policies underlying solar energy as a common good. In placing the

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SCCTM in the history of legal reforms enabled through trust law, we draw on key ethical and common property theories supporting the creative evolution of trust ownership for environmental and social equity today. The Article concludes by noting the social innovations for intergenerational equity and common good that result in using the SCCTM.

SC BENEFICIARIES SHOWCASE THEIR DEED TO EQUITABLE TITLE OF THE SUN'S COMMON WEALTH THROUGH PUBLIC ART

Solar Commons Mural in Trust Beneficiary Neighborhood (Wright Elementary School, Tucson, AZ; for a sense of scale, the author is standing in the corn.) Artist: Karlito Espinoza 2020. Photo courtesy of Dorsey Kaufmann.

INTRODUCTION

By 2019, distributed solar energy was among the fastest growing renewable energy sources in the United States.[1] However, U.S. solar laws have created a "solar income gap" whereby low-income communities are not equitably sharing in the benefits of solar ownership.[2] Although the sun shines for everyone, markets and states have not been able to make the benefits of this common-property resource accessible to all. This Article demonstrates how trust law, as applied in the Solar Commons Community Trust Model

1. *See* Silvio Marcacci, *Renewable Energy Job Boom Creates Economic Opportunity as Coal Industry Slumps*, FORBES (Apr. 22, 2019), https://www.forbes.com/sites/energyinnovation/2019/04/22/renewable-energy-job-boom-creating-economic-opportunity-as-coal-industry-slumps/#616e0afe3665.

2. *See* JAMES A. MUELLER & AMIT RONEN, GW SOLAR INST., BRIDGING THE SOLAR INCOME GAP 1 (2015).

(SCCTM),[3] provides a practical, equitable, and local approach for low-income communities that have principally been left out of the economic benefits of the solar energy boom. The SCCTM[4] is built on the use of trusts, one of the oldest forms of property ownership. Simply put, a trust is a collection of assets committed or entrusted to an entity to be managed or cared for in the interest of another.[5] The SCCTM is innovative in that it uses this resilient and time-tested legal structure to capture, monetize, and locally distribute the benefits of solar-generated energy to provide a multitude of benefits to underprivileged communities in ways that go far beyond what is possible in current U.S. community solar ownership models. Thanks to the charitable purposes inherent in the SCCTM, a Solar Commons trust provides an economic tool for community empowerment and engagement. As this Article demonstrates, there are many practical benefits to using the SCCTM. Additionally, we argue that the Solar Commons model could play a larger role supporting legal innovation of the method, means, and scalability of the distribution of solar energy benefits to low-income communities within the U.S. electricity system.

To understand the dual contribution that the SCCTM makes as a practical equity solution and as a broader conceptual tool for legal innovation, this Article notes how the SCCTM overcomes specific limitations of U.S. community solar ownership. It considers the broader conceptual issues inherent in how the current dominant property regimes support energy ownership in the United States. Notably, existing

3. For an analysis of the Solar Commons financial model and its scalability potential in the United States, see KEVIN BREHM & GENEVIEVE LILLIS, ROCKY MOUNTAIN INST., SOLAR COMMONS FINANCIAL ANALYSIS RESULTS: SOLAR COMMONS PROJECT ANALYSIS PHASE 1 OF 2 (2018); KEVIN BREHM & GENEVIEVE LILLIS, ROCKY MOUNTAIN INST., SOLAR COMMONS SCALABILITY AND CONSTRAINTS ANALYSIS: SOLAR COMMONS FINANCIAL ANALYSIS PHASE 2 OF 2 (2018). Kathryn Milun is the founder and principal researcher of the Solar Commons Project, which created and prototyped the SCCTM. Dr. Milun is licensed to use the trademarked name "Solar Commons" and to design the standards and processes of the SCCTM as it is prototyped and developed into shareable, open-source tools for all communities to use. The first Solar Commons prototype was connected to the grid in Tucson, Arizona in 2018.

4. The basics of the Solar Commons Community Trust Model (as explained in more detail in Part III of this Article) are as follows: Community actors wish to fund a project or program serving a low-income, reparative justice need in their community and find a willing, civic-minded organization to host a solar array in trust on its building or real property. Working with a solar installer, the community group determines the costs and site requirements for a solar installation and sources donations or other financing for the solar array. The group builds the array for the trust and creates a trust agreement with community members outlining how the energy savings resulting from the array's output realized on the host's electricity bill will be monetized and used to create a community benefit. The host becomes a Solar Commons co-trustee along with community actors and follows the directives of the trust agreement to subtract any hosting costs and pass the remaining sum on to the beneficiary—an organization, community group or program serving the identified low-income need.

5. Peter Jaffey, *Explaining the Trust*, 131 L.Q.R. 377, 377 (2015).

"community solar" ownership models are embedded in the dominant ownership models and distribution infrastructures of 20th-century electric grids and utilities—large-scale technologies with centralized ownership institutions overlaid by private property and public regulatory regimes. The authors will go into this further in Part II. We ask the reader to consider whether these current energy ownership models, designed for extractive fuel industries of coal, oil, and gas, have the conceptual property framework to further the distributed ownership potential inherent in renewable energy resources like solar and wind (the authors and several legal scholars think they do not).[6] The sun shines and the wind blows for everyone. These renewable energy resources have potential to expand energy democracy in the United States. The authors argue that solar-generated electricity is a 21st-century common-property resource whose potential is limited by the dominant private and public property regimes of the 20th century.

Current U.S. community solar ownership models demonstrate the impacts of conventional property regime constraints by failing to serve community needs in two key ways. First, there is a paucity of community solar ownership models—basically three—available in the United States.[7] Second, individual households, not the collective community, are the

6. Shalanda H. Baker, *Unlocking the Energy Commons: Expanding Community Energy Generation*, *in* LAW AND POLICY FOR A NEW ECONOMY 211, 212 (Melissa K. Scanlan ed., 2017) (arguing that current community energy models "fail to fully advance transformative energy justice"); Alexandra B. Klass, *Property Rights on the New Frontier: Climate Change, Natural Resource Development, and Renewable Energy*, 38 ECOLOGY L.Q. 63, 119 (2011); Saskia Vermeylen, *Resource Rights and the Evolution of Renewable Energy Technologies*, 35 RENEWABLE ENERGY 2399 (2010) (arguing that modern renewables "could be effectively governed in a more collaborative manner"); Dan van der Horst & Saskia Vermeylen, *The New Energy Commons: Exploring the Role of Property Regimes in the Development of Renewable Energy Systems*, 12TH BIENNAL CONF. ON INT'L ASS'N FOR STUDY COMMONS, July 2008 (arguing adoption of the appropriate regime is necessary to "enable individuals and communities to contribute actively to a more sustainable and low carbon energy future"); *see generally* Margaret A. McKean, *Common-Property Regimes as a Solution to Problems of Scale and Linkage*, *in* RIGHTS TO NATURE: ECOLOGICAL, ECONOMIC, CULTURAL, AND POLITICAL PRINCIPLES OF INSTITUTIONS FOR THE ENVIRONMENT 223, 224 (Susan Hanna et al. eds., 1996) (arguing the "privatization" of resource rights fails to consider major issues).

7. Compare this with, for example, the variety of citizen-owned community solar ownership models in Europe, in particular coming from Scotland. *See* JOSH ROBERTS ET AL., CLIENT EARTH, COMMUNITY POWER: MODEL LEGAL FRAMEWORKS FOR CITIZEN-OWNED RENEWABLE ENERGY 21, 29–30 (2014). Recently, the U.S. Department of Energy sought to trigger innovation around community solar ownership models for moderate- and low-income communities by sponsoring the 18-month "Solar in Your Community Challenge" competition, which ended in 2018. *See Solar in Your Community Challenge*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, https://www.energy.gov/eere/solar/solar-your-community-challenge (last visited Apr. 14, 2023). The Solar Commons Project was a finalist in this competition.

beneficiaries of these types of community solar ownership.[8] Notably, with current community solar ownership models, only *individual households* receive the solar savings on their private net energy metered electric bills.[9] By contrast, the Solar Commons Community Trust Model passes a solar array's savings to a community trust fund that can be used to run after-school programs, job trainings, safer spaces to play and congregate—in short, common goods that empower the community as a whole.

The authors will show how the Solar Commons Community Trust Model addresses the above problems in practical and conceptual ways. From a practical standpoint, the Solar Commons Community Trust Model creates an equitable title for low-income community stakeholders to be "owners" of the benefits of a local solar array. Solar Commons also offer a process for stakeholders to participate in the local governance of these solar-generated community benefits for the duration of the solar array's life. Finally, by generating money for the Solar Commons trust fund, a Solar Commons-owned array produces an income stream maximized to support local low-income community empowerment programs.

It is important at this point to introduce the concept of the "commons," a foundational framework of the Solar Commons Community Trust Model. From a conceptual standpoint, the SCCTM treats the clean energy of the sun as a common property generating common wealth.[10] In doing so, Solar

8. There are three types of U.S. community solar ownership, all of which move the locus of control away from the consumer and aim, by design, to benefit utility-scale generation and economies of scale. In all three types of community solar ownership "a solar generation facility is constructed; a promoter or sponsor solicits subscriptions for the project; and once the project is fully subscribed, the promoter receives any relevant tax or renewable energy credits and the electricity generated is credited to subscribers." *See* Baker *supra* note 6, at 217. The three ownership types are utility or third-party owned projects; special purpose entity-owned projects; and non-profit owned projects. *Id.* Baker notes that while all three community solar ownership models emerged from the complex "energy policy soup" aimed at addressing the equity issues of the solar income gap, they did little to offer authentically equitable opportunities for community energy development, did little to foster more distributed models of generation, and they remain inadequate to serve moderate- and low-income communities. *Id.* at 215–16, 223, 224. Baker further notes that "[a] cottage industry of sorts has emerged to capitalize on new models of customer-owned generation; however, [the National Renewable Energy Lab] emphasizes that utilities should take the lead in developing such projects." *Id.* at 217.

9. *Id.*

10. Common property regimes, generally speaking, define rights and duties that a group of resource users share toward a resource. Common property regimes change with the nature of the resource they govern. Air, water, and biodiversity, for example, are diverse common property resources with diverse governance rules. Changes in technology can also create new kinds of common property resources, as with the emergence of the internet and photovoltaic electricity generation. For a general introduction to common property regimes, see ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION (James E. Alt & Douglass C. North eds., 1990). *See also* Margaret A. McKean, *Common Property: What Is It, What Is It Good For, and What Makes It Work?*, *in* PEOPLE AND FORESTS: COMMUNITIES, INSTITUTIONS, AND GOVERNANCE 27, 29–30 (Clark

Commons trusts engage the terminology and framework of commons,[11] recalling both the historic function of trust ownership in stewarding common property energy resources (such as forests, agricultural fields, and peat bogs as commons for underserved communities in feudal property regimes) and the contemporary function of commons terminology to describe emerging digital domains (such as the internet built on infrastructure code supporting "net neutrality" and Creative Commons licensing). Like the radically new internet and the enduring ancient forest commons, solar energy offers technological and social equity opportunities to use common property terms and frameworks.

Through its conceptual and practical solutions, the Solar Commons Community Trust Model enables creative, effective, and meaningful community ownership for the free, ubiquitous, renewable, and common property resource of solar energy.[12] The SCCTM allows communities to hold solar energy assets even within current utility ownership structures, which present many obstacles regarding renewable energy ownership. In accomplishing this, the Solar Commons Community Trust Model creates an iterable and scalable way to create equitable interests for low-income

Gibson et al. eds., 2000) (introducing common property regimes); Bob Pokrant, *Common Property Theory*, *in* GREEN POLITICS: AN A-TO-Z GUIDE 63, 63 (Dustin Mulvaney ed., 2011) (providing an overview and background of the common property theory). For a discussion of the emergence of common property regimes for governing shared resources whose conditions are given in terms of the biophysical realities and potentials of 21st-century environments and technologies, see BURNS H. WESTON & DAVID BOLLIER, GREEN GOVERNANCE: ECOLOGICAL SURVIVAL, HUMAN RIGHTS, AND THE LAW OF THE COMMONS 262 (2013).

11. The term "commons" can denote the modern understanding of shared resources—natural, social, cultural—"in which each stakeholder has an equal interest." C. Hess, *Research on the Commons, Common-Pool Resources, and Common Property*, IND. UNIV. DIGIT. LIBR. COMMONS (Oct. 2006), http://dlc.dlib.indiana.edu/dlc/contentguidelines. Commons also denotes the historical practice of "commoning" as practiced in England on shared agricultural fields, grazing lands, and forests. *See* CHRISTOPHER P. RODGERS ET AL., CONTESTED COMMON LAND: ENVIRONMENTAL GOVERNANCE PAST AND PRESENT 19–25 (2011). The concept of commons also existed in the Roman legal category *res communis*, applied to things common to all to be used and enjoyed by everyone (e.g., air, water, seashore). This is extended in modern international law to include the high seas, the Earth's atmosphere, outer space, and other global domains now accessible through new technologies. *See* KATHRYN MILUN, THE POLITICAL UNCOMMONS: THE CROSS-CULTURAL LOGIC OF THE GLOBAL COMMONS 57 (2011). More recently the concept of commons has been applied to the modern energy sector. *E.g.,* Baker, *supra* note 6, at 212; JEFFREY R. S. BROWNSON, SOLAR ENERGY CONVERSION SYSTEMS 287–305 (2014) (discussing the sun as a commons or a public good).

12. Writing of the value of community-owned solar in the new, sustainable economy, Kevin Jones, Director of the Vermont Law School Energy Clinic notes: "It is paramount that this free, ubiquitous and renewable resource should be locally owned and developed in a manner that respects the local landscape, enhances community wealth, and brings the community together regularly in celebration of the magnificence of the sun." Kevin B. Jones & Mark James, *Distributed Renewables in the New Economy: Lessons from Community Solar Development in Vermont*, *in* LAW AND POLICY FOR A NEW ECONOMY: SUSTAINABLE, JUST, AND DEMOCRATIC 189, 210 (Melissa K. Scanlan ed., 2017).

communities in the sun's common wealth, produce common-good benefits to communities, and expand intergenerational equity by demonstrating how to name, claim, and legally reframe specific Earth resources as common property for common good.

Thanks to its practical value for local communities and its innovative use of trusts, the Solar Commons Community Trust Model can also be viewed in the larger context of the role that trust law has historically played in the reform of the English legal system. Harvard law professor A.W. Scott, the author of a foundational 20th-century treatise on the law of trusts,[13] noted this dual function of trust law in his historical essay *Trust as an Instrument of Law Reform*.[14] The trust, Scott emphasized, was fundamentally a practical tool: "No logician, no philosopher, could have evolved [the trust]. It has developed as it has as a practical means of accomplishing certain results which could not otherwise have been easily attained."[15] But, thanks to its practical nature, Scott noted, the trust played a fundamental role in reforming key areas of English law: "It was chiefly by means of uses and trusts that the feudal system was undermined in England . . . that the economic position of married women was ameliorated . . ." and that civic associations, charities, and business enterprises were enabled to accomplish their purposes.[16] The Solar Commons Community Trust Model, we argue, has the capacity to carry on the historic tradition of law reform and innovation noted by Scott: It is at once a practical response to the limitations of current U.S. community solar ownership models and, as we demonstrate in this Article, it can play a larger role supporting legal reform of our fossil fuel-based electricity system.

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13. *See generally* AUSTIN WAKEMAN SCOTT & WILLIAM FRANKLIN FRATCHER, THE LAW OF TRUSTS (Mark Ascher ed., 4th ed. 1987). Scott's work was also the foundation for the Uniform Trust Code issued in 2000 by the National Conference of Commissioners on Uniform State Laws, a nonprofit association which promotes the adoption of uniform laws from state to state. *See* NAT'L CONF. OF COMM'RS ON UNIF. STATE LS., UNIFORM TRUST CODE (2005). As of 2018, 33 states had adopted the Uniform Code in part or in whole. For updates on state adoption, see *Trust Code*, UNIF. L. COMM'N., https://www.uniformlaws.org/committees/community-home?CommunityKey=193ff839-7955-4846-8f3c-ce74ac23938dyy (last visited Apr. 14, 2023). For a discussion on the unification of trust law, see John H. Langbein, *Why Did Trust Law Become Statute Law in the United States*, 58 ALA. L. REV. 1069 (2006).

14. Austin W. Scott, *Trust as an Instrument of Law Reform*, 31 YALE L.J. 457 (1922).

15. *Id.* at 468. Scott sums up the history of trust law by noting:

> The development of the trust idea has involved a great deal of muddling and a great deal of common sense; little of sound logic, but much of expediency. It is no wonder that Gierke said to Maitland that he could not understand the English trust. No logician, no philosopher, could have evolved it. It has developed as it has as a practical means of accomplishing certain results which could not otherwise have been easily attained.

16. *Id.* at 457–58. Scott notes that "it was the trust device which actually was chiefly instrumental in bringing [these reforms] to pass."

The following section (Part II) provides historical context for the argument that, just as trust ownership was a tool for legal reform of past property regimes, the SCCTM has the capacity to be a vehicle for legal reform in current U.S. energy ownership. This historical section demonstrates why trust ownership is a logical legal tool to help address inequities facing low-income communities who want to capture wealth from the solar market today. From its earliest uses to circumvent inequitable property regimes of the feudal English economy to its later uses to bypass restrictions in public and private property regimes and avoid inequities of market speculation in a capitalist economy, trust ownership has evolved to become an efficient vehicle to gain control of an asset despite obstacles of the dominant property regimes of its times.

Part II describes enduring features of trust law adapted by the SCCTM to create a new, equitable model for trust ownership within the emerging field of distributed solar energy. Part III provides a practical outline of the Solar Commons Community Trust Model, pointing out how it applies principles of trust creation to low-income community ownership of solar energy assets. Two detailed scenarios of Solar Commons trust creation, in practice, are offered based on Solar Commons prototypes which the authors have worked on in the United States.

Part IV considers the legal ramifications of using the SCCTM and describes how the model avoids policy barriers facing deployment and scaling of community solar in the United States today. Part V evaluates the contribution of the Solar Commons Community Trust Model in the areas of intergenerational equity and institution-building for 21st-century common property regimes that serve the common good. The Article concludes by reiterating the enduring value of using one of the oldest forms of property ownership, the trust, to direct and manage the benefits of a 21st-century technological asset, solar energy, for intergenerational equity.

I. TRUST OWNERSHIP AS A PRACTICAL PROBLEM-SOLVING AND CONCEPTUAL LAW-REFORMING TOOL IN FEUDAL AND MODERN PROPERTY REGIMES

Solar Commons trusts use basic legal structures that have evolved in the Anglo-American common law tradition to form a creative, well-tested vehicle to gain control of an asset outside the constraints of the dominant property regimes of our time. By recounting the strategic uses of trusts in the past, this Part provides deep insight into why trusts offer a logical ownership vehicle today for low-income communities whose equitable interests in

accessing the common wealth benefits of solar energy are not adequately served by current U.S. solar energy ownership models.

A. Trusts in Feudal Property Regimes

In medieval England, trust ownership evolved to be a creative solution, enforced by equity courts, to hold assets in land that would otherwise be subject to the hierarchical ownership rules and obligations of the feudal property system imposed by the Norman Invasion of 1066.[17] After the invasion, all land in England was owned by the King who could grant estates in land to lords who in turn could parcel out property to tenants.[18] The feudal property regime was generally ineffective for serving vulnerable groups such as women (who could not own property) and soldiers (who were away from their land during wartime).[19] Thus, an early solution-oriented form of trust ownership often involved a knight or a tenant of a feudal estate entrusting the legal title of their land to a friend or relative. The entrusted party would swear to return the property to them or their heir after a given period of time in order to avoid the land being turned over to the wardship of the lord of the manor.[20] Both soldiers away on crusade and widows unable to hold their deceased husband's property might ask a trustworthy male friend or relative to hold legal title of their land in trust for safekeeping until they returned from that distant war or their male children were of age to inherit.

Without this entrustment of property, soldiers, widows, and their heirs would be deprived of the future benefits the property could provide for them. The effect of such trust ownership uses was thus to sever land ownership into a legal title (which was held by the entrusted friend) and an equitable title (which favored the beneficiary).[21] The SCCTM also uses these legal structures to sever ownership of a solar asset into a legal title (held by the owner of the site hosting the solar array) and an equitable title (held by an entity mandated to serve the common-good needs of a specific low-income community).

The SCCTM also uses trust ownership relationships that emerged with the feudal property status of agricultural and energy commons. Feudal

17. *See* JOHN BAKER, INTRODUCTION TO ENGLISH LEGAL HISTORY 15 (5th ed. 2019).

18. *Id.*

19. For a discussion of the rules that disadvantaged women and minors in the inheritance regime of medieval England, see 3 W.S. HOLDSWORTH, A HISTORY OF ENGLISH LAW 516–33 (3d ed. 1923). For a discussion of how trusts were used to remedy disadvantages faced by soldiers away from their land, see Scott, *supra* note 14, at 457.

20. 3 HOLDSWORTH, *supra* note 19, at 525–26.

21. *Id.*

commons are lands belonging to the lord of a feudal manor that contain specific agricultural fields and pastures for food provisioning or wetlands and forests rich in energy resources like peat and wood—in short, land parcels which, through established custom, had served the subsistence needs of local farmers and villagers from time immemorial.[22] Post-conquest English common law could recognize and protect the customary uses[23] of these land parcels as commons, often using trust arrangements to secure and manage these food and energy resources for the benefit of the local peasant class who could not own land.[24] A peasant's user right in designated arable fields, woods, and even streams might belong as an appurtenant equity interest to generations of inhabitants (beneficiaries) of cottages residing on manor lands.[25] The aristocratic or ecclesiastic land owners who held legal title to these lands would also hold fiduciary duties to maintain access to and

22. *See* Susan Oosthuizen, *Archaeology, Common Rights and the Origins of Anglo-Saxon Identity*, 19 EARLY MEDIEVAL EUROPE 153, 153–54 (2011); Susan Oosthuizen, *The Roots of the Common Fields: Linking Prehistoric and Medieval Field Systems in West Cambridgeshire*, 4 LANDSCAPES 40, 40–41 (2003).

23. E.P. THOMPSON, CUSTOMS IN COMMON 259–351 (1991) (discussing the relationship between customary law, commons, and the idea of a persistent "moral economy" in late feudal and early capitalist England).

> Thompson's use of "moral" in moral economy conflated two interrelated meanings of the word (sometimes with more emphasis on one than the other). The first is "moral" in relation to "mores" or customs, with both understood as historical products thoroughly interwoven in a social fabric. . . . The second meaning of "moral" relates to a principled stance vis-à-vis society, the world, and especially the common good, with the latter defined both in terms of customary rights *and* utopian aspirations.

Marc Edelman, *E.P. Thompson and Moral Economies*, *in* A COMPANION TO MORAL ANTHROPOLOGY 49, 55 (Didier Fassin ed., 2012). *See also* KARL POLANYI, THE GREAT TRANSFORMATION: THE POLITICAL AND ECONOMIC ORIGINS OF OUR TIME (2d ed. 2001) (arguing that the commons and stinted local markets that protected English peasants during this period formed a "moral economy" that would be challenged by larger-scale financial arrangements arising with capitalism).

24. For examples of Common Law cases where court upholds rights of "non-property owners" see GARETH JONES, HISTORY OF THE LAW OF CHARITY 1532–1827, at 22, 25, 72 (1969); W.K. JORDAN, 1 PHILANTHROPY IN ENGLAND 1480–1660, at 75, 143 (2016). *See also* Sara Birtles, *Common Land, Poor Relief and Enclosure: The Use of Manorial Resources in Fulfilling Parish Obligations 1601–1834*, 165 PAST & PRESENT 80, 82 (1999). Birtles notes:

> The use of common land in sustaining the poor, as it developed, fell within the sphere of philanthropy and was thus insulated from the formal relief structure. The practical and monetary benefits arising from such perpetual charities were so great in the early years of the poor law that its full implementation was unnecessary except in years of particular hardship.

Id. At 82.

25. *See* Birtles, *supra* note 24, at 85–86. In the feudal land ownership system, the poor included paupers (landless poor) and "cottagers" who were peasants working on manorial lands and holding rights to inhabit cottages that belonged to the manorial estate. User rights (enfeoffments to use) in local commons were rights that were allotted (appurtenant) to the cottage itself.

sustainably manage the commons which often had local bylaws that were well-known and adapted over time for local peasant users.[26] Fiduciary duties to oversee these lands might be held by a manor overseer or a parish-level civic counsel. When legal title to land containing such designated commons was conveyed for charitable purposes to a local church, a trust might be used so that churchwardens of the local parishes would become trustees of the equitable property interests of the peasant commoners (beneficiaries).[27] As early as the 13th century, the Magna Carta also recognized and protected use rights throughout the King's forests and fens for commoners to collect firewood (estover); to graze cattle (agistment); to cut turf/peat for fuel (turbary); and much else.[28] Trust law often provided the equitable solution to secure these use rights for the intergenerational needs of the peasant class who were not allowed to own land.

It is a sign of the robust nature of trust ownership that, to this day in Ireland, England, Wales, and Scotland, the ancient practice of energy commoning still functions. U.K. citizens in rural areas exercise their equitable property rights to local turbary and forest commons to cut peat and gather wood to heat their homes.[29] The National Trust is one institution that

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26. For an example of commons bylaws, see Angus J.L. Winchester, *Upland Commons in Northern England*, *in* THE MANAGEMENT OF COMMON LAND IN NORTH WEST EUROPE, C. 1500–1850, at 33, 40–42 (Martina De Moor et al. eds., 2002).

27. Birtles, *supra* note 24, at 81–82 ("Churchwardens and [manorial] overseers acted as trustees when administering charitable bequests, a role they kept separate from the distribution of parish relief."). For a discussion of manorial jurisdictions, see William J. Jones, *A Note on the Demise of Manorial Jurisdiction: The Impact of Chancery*, 10 AM. J. LEGAL HIST. 297 (1966).

28. While students of law are familiar with the Magna Carta's description of basic civil liberties and rights to protection from the sovereign's arbitrary abuses of power, less well known are the Magna Carta's forest provisions for commoners. The Magna Carta's Forest Charter was one of the first written documents on the limits of privatization. *See* WESTON & BOLLIER, *supra* note 10, at 107–08. *See also* PETER LINEBAUGH, THE MAGNA CARTA MANIFESTO: LIBERTIES AND COMMONS FOR ALL (2008) (discussing the variety of rights included in "394ommuning," particularly grazing rights, estovers—the taking of wood from the common for specified use upon the appurtenant property, and the right of turbary—the cutting of turf and flags for fuel in the house to which the right is attached).

29. The persistence of diverse rights of common in the United Kingdom today is noted in several contemporary venues. *See, e.g.*, *Turbary and Estovers: Even the Hearthstone Has Rights!*, NEW FOREST COMMONER (Dec. 10, 2013), http://newforestcommoner.co.uk/2013/12/10/even-the-hearthstone-has-rights/.

> The ancient rights of common were not assigned to an individual but to the property. If the homeowner sold the house the rights would pass to the next owner. In the case of Turbary and Estovers, upon which many commoners depended, the rights were assigned to a specific part of the house, namely the hearthstone or fireplace. If a commoner, with fuel rights, rebuilt his dwelling elsewhere on his land he was careful to preserve the old fireplace. De Crespigny and Hutchinson remarked, "it is for this reason that we sometimes see in the Forest a fireplace curiously situated in a cabbage bed or an orchard, with no apparent function or reason for existence. It stands there in witness of its owner's rights of fuel."

continues the function of fiduciary protector of local energy provisioning practices in the United Kingdom by holding the legal property title and sustainably managing the peat or forest resource for the commoners' benefit.[30] By splitting the ownership of land into a legal title and an equitable title, these forests and turbary commons are precursors to the energy commons proposed by the Solar Commons Community Trust Model: They are examples of the historic capacity of trust law to deliver, over centuries, intergenerational equity by using energy derived from the commons to provide for the needs of underserved households. Even within a legal system that protected the interests of the dominant feudal landowners, trust ownership provided a vehicle to protect the equitable interests of landless commoners, women, and soldiers over generations. The SCCTM owes its name, its roots in intergenerational equity, and its robust legal structure to the historical English energy commons.

B. Trusts and Modern Property Regimes

How does the SCCTM use the features of trust ownership to update the concept of an "energy commons" to serve low-income communities with the new, distributed, solar energy-capturing technologies of the 21st century? To answer this, it is important to understand how trust law evolved from serving those who were underrepresented in feudal property regimes (peasants, women, soldiers) to serving the emerging issues of ownership in a modern private property regime with expanding capitalist markets. As we will show, the same trust features that were creatively used in the past were flexible enough to adapt over time. In particular, two features made trust ownership an attractive tool to protect property assets within the growing powers and emerging institutions of markets and states: The trust's capacity to own and manage property (1) with severed title and (2) without specific permissions from outside authority (of either feudal lords or modern states). These two features of trust ownership made it an attractive, regulation-light vehicle for expanding modern businesses and protecting ownership interests over the past half-century. By understanding how these two features—severed title and the protected privacy to create trust agreements—became useful ownership strategies to avoid restrictions in modern property regimes, it becomes clearer why the SCCTM provides a logical and equitable solution for holding solar resource assets for low-income communities within the

Id.; *see also Commoning*, NEW FOREST, https://www.thenewforest.co.uk/explore/new-forest-heritage/commoning (last visited Apr. 15, 2023) (describing commoners' rights in the New Forest).

30. *Commoning*, NEW FOREST, https://www.thenewforest.co.uk/explore/new-forest-heritage/commoning (last visited Apr. 15, 2023).

dominant ownership structures of regulated-electric utilities and monopoly-owned grids, legal structures which are proving resistant to the new renewable energy technologies and pollution standards which increasingly assume the common property values of sunshine, wind, clean air, and a robust climate system.

Severed title proved to be a useful ownership tool during both the waning of feudalism and the expansion of the private property system under capitalism. While feudal law had ensured intergenerational property transfer through patriarchal birthright (namely, the rule of primogeniture), by the 16th century and with the rise of a money economy, English landowners would use trusts to convey the legal title of their land to third parties for the purpose of avoiding some of the harsh realities of the feudal inheritance rules.[31] By creating a trust, landowners could also protect their property from creditors[32] and ensure their property would continue to be used for a particular purpose after their death.[33] To do so, property owners would sever the title of their property. The landowner would transfer the legal title to a third party, the trustee, and retain the equitable, or beneficial, title.[34] In the context of the emerging private property laws of the time, the landowner became the settlor of the trust by conveying the legal title and either retained the right of enjoyment of the property or gave the equitable title to someone else, such their spouse, tenants, or female or minor child (i.e., beneficiary).[35] This arrangement entitled the beneficiary to have all of the benefits of ownership (i.e., equitable title)—such as the benefit of use, enjoyment, and the right to profits—while simultaneously protecting the loss of that interest.[36] By functioning as an ownership vehicle with creditor protection, the trust model became even more popular.[37] While some creditor protections of trust law

31. *See* John Morley, *The Common Law Corporation: The Power of the Trust in Anglo-American Business History*, 116 COLUM. L. REV. 2145, 2152 (2016) (explaining the obligations—"feudal incidents"—that burdened landowners and led to the rising popularity of trusts).

32. *Id*. at 2167; *see generally* RESTATEMENT (THIRD) OF TRS. (AM. L. INST. 2012).

33. Morley, *supra* note 31, at 2155.

34. *Id*. at 2155–56.

35. *Id*. at 2151; *see generally* RESTATEMENT (THIRD) OF TRS. (AM. L. INST. 2012).

36. Morley, *supra* note 31, at 2156.

37. Historically, a creditor could only establish a claim against a legal property interest held by the debtor. By severing the legal and equitable title, the settlor transferred their ownership interests to the trustee and beneficiary, respectively. The beneficiary held an equitable interest and had no right to transfer or encumber the property and thus did not risk losing legal title, which was held by the trustee. Correspondingly, the same was true for the settlor who no longer risked losing legal title. On the other hand, the trustee, who held the legal title, had no right to benefit from the property and thus the creditors of the trustee found themselves without reparation. *Id.* at 2151–54 The same creditor protections offered by trust are unique and still not available to most third-party beneficiaries under contract law. David M. Summers, *Third Party Beneficiaries and the Restatement (Second) of Contracts*, 67 CORNELL L. REV. 880, 885–86 (1982).

have remained the same, many aspects have evolved throughout the centuries and led to its application in other areas of practice.[38] Severed title of trust ownership thus became a useful modern tool for holding assets in the transition from a feudal to a capitalist market economy. Today, the SCCTM uses severed title as a way to protect the equitable (or beneficial) property interests of low-income communities to their commonwealth share of the energy resource of the sun.

In addition to the tool of severed title, trust ownership offered another creative and protective feature to manage an asset despite restrictions in the dominant property rules of its time. While feudal trust arrangements were used to protect private estates (for the equitable benefit of absent soldiers or widows) and land shared as commons (for the equitable benefit of landless peasants) from coming under the full authority of a feudal lord, later trust ownership evolved to protect interests in private property and in public lands from, respectively, the growing powers of the regulatory state and the emerging market economy. Thus, over the 19th and 20th centuries, we find trust ownership becoming (especially in the United States) a popular ownership structure for large businesses with many passive investors[39] and a useful governance structure to restrict harmful economic development on private and public lands.[40] What features of trust ownership allowed both large businesses and local and state land conservationists to manage their financial and natural resource assets in ways that creatively circumvented the powerful legal regimes in which they were embedded? To answer this question, we need to look specifically at how the trust business model and the trust land conservation model adapted trust law to the conditions of their time. Understanding this, we can see the underlying logic of using trust

> Since the recognition of third party beneficiary rights, courts have grappled with two major problems. First, third party beneficiary law should be able to allow equitable recovery without conferring enforcement rights upon every party who might receive some benefit from a contract. Second, it is important to preserve the rights of the original parties to modify their contract without nullifying the protection of third party rights.

Id. at 880. Trust law, by contrast, acknowledges a beneficiary's rights by permitting greater enforcement protections. *See generally* RESTATEMENT (THIRD) OF TRS. (AM. L. INST. 2012); UNIF. TR. CODE (UNIF. L. COMM'N 2010).

38. John H. Langbein, *The Secret Life of the Trust: The Trust as an Instrument of Commerce*, 107 YALE L.J. 165, 166 (1997) (noting the reality of American trust practice is at odds with its traditional characterization as the law of gratuitous transfers).

39. *Id.* at 170.

40. *See* Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471, 490 (1970); *see also* S.V. Ciriacy-Wantrup & Richard C. Bishop, *Common Property as a Concept in Natural Resources Policy*, 15 NAT. RES. J. 713, 725 (1975).

ownership today for gaining control of distributed solar energy technologies for the interests of low-income communities in the United States.

Beginning with the rise of the business trust, we see the flexibility and privacy of trust creation offering an advantage over another key form of business ownership arising at the time: the corporation.[41] Both trusts and corporations were emerging as organizational structures for businesses during the transition from a feudal to a regulated market economy. The early form of the business corporation, however, was actually a more restricted ownership vehicle than the trust.[42] While English courts recognized centuries of trust common law and statutory authority to enforce the business trust's obligation to serve the interests of its' company's *passive* investors (i.e., the beneficiaries of the trust), the English corporation, on the other hand, was a new and more unpredictable ownership vehicle.[43] It required the additional step of a license (at first from the King and subsequently from parliament) to gain recognition and protection from the law.[44] Moreover, the license of the early business corporation generally permitted the corporation to serve only a particular purpose in the interests of its *active* investors.[45] The business corporation thus initially evolved as an ownership vehicle that had more government restrictions than the trust.[46] Contrary to their function in the 20th century, the early English corporations were often used to raise capital to fund defined *public* purposes.[47] In 18th- and 19th-century England, for example, corporations raised money to build railways and canals.[48] These early corporations had active investors, shareholders, who provided capital for construction, but their role as investors was subordinate to the primary function of the corporation, which was to fulfill their state-licensed condition of bridge-building or canal construction.[49] Once they served their licensed purpose, the corporation dissolved.[50] Indeed, it was not until the 20th century that the interests of corporate shareholders to generate profits on their

41. *See generally* Giuseppe Dari-Mattiacci et. al., *The Emergence of the Corporate Form*, 33 J.L. ECON. & ORG. 193, 194 (2017).

42. *See id.* at 195.

43. *Dodge v. Ford Motor Co*., 170 N.W. 668, 684 (Mich. 1919). While fiduciary duties can exist in other legal relationships, such as contractual relationships, our present Article focuses on the use of trust law to enforce centuries of trust common law and statutory authority to monetize the benefits of solar energy to low income and underserved communities.

44. *Id.*

45. *Id.*

46. *See* Julian Franks et al., *Ownership: Evolution and Regulation*, 22 REV. FIN. STUD. 4009, 4040 (2009).

47. *Id.*

48. *Id.*

49. *Id.*

50. *Id.*

investment became the established primary function of the publicly licensed corporate form.[51] Thus, in the early days of capitalism, the business trust had the advantage of trust law to enforce centuries of trust common law and statutory authority, whereas the corporation rested on newly developing statutes that could be both rigid and unstable. Over time, trust-based companies became known as "unincorporated" companies and corporation-based companies were known as "incorporated" companies.[52]

Both trusts and corporations grew in popularity in the late 1600s and early 1700s, "with perhaps a hundred unincorporated trust-based companies operating in England by the late 1600s."[53] The trust, as a business model, made its way to America and remained popular throughout the early part of the 20th century due in large part to the fact that statutes in the United States disincentivized the incorporation of American companies. American laws offered much harsher treatment of companies that chose to incorporate. These laws detailed, among other things, shareholder voting requirements, maximum capitalization limits, personal liability for directors, restrictions on dividend payments, complicated appraisal remedies in mergers, and restrictions on ownership of shares in other corporations.[54] Eventually, by the 18th century, English incorporation statutes required all English businesses to incorporate.[55] In contrast, the general corporate statutes in the United

51. *See* COLIN MEYERS, FIRM COMMITMENT: WHY THE CORPORATION IS FAILING US AND HOW TO RESTORE TRUST IN IT 39 (2013). Today there is a renewed interest in how the corporate business model might once again serve the public interest through restrictions that involve fiduciary duty. The public-benefit corporation, for example, is specific type of corporation that allows for public benefit to be a charter purpose in addition to the traditional corporate goal of maximizing profit for active shareholders. *See* David G. Yosifon, *Opting Out of Shareholder Primacy: Is the Public Benefit Corporation Trivial?*, 41 DEL. J. CORP. L. 461, 463 (2016); *see also* Alissa Mickels, *Beyond Corporate Social Responsibility: Reconciling the Ideals of a For-Benefit Corporation with Director Fiduciary Duties in the U.S. and Europe*, 32 HASTINGS INT'L & COMP. L. REV. 271, 280–81 (2009).

52. *See* Paddy Ireland, *Capitalism Without the Capitalist: The Joint Stock Company Share and the Emergence of the Modern Doctrine of Separate Corporate Personality*, 17 J. LEGAL HIST. 41, 42 (1996).

53. Morley, *supra* note 31, at 2158.

54. These laws detailed, among other things, shareholder voting requirements, maximum capitalization limits, personal liability for directors, restrictions on dividend payments, complicated appraisal remedies in mergers, and restrictions on ownership of shares in other corporations. *See* Ron Harris & Naomi Lamoreaux, *Contractual Flexibility Within the Common Law: Organizing Private Companies in Britain and the United States* 13 (June 2010) (unpublished manuscript), http://perma.cc/2J8U-J9WS (noting American incorporation statutes were restrictive in that they limited the size of the corporation, limited the business in which it could engage, and mandated governance structures); *see generally* Harwell Wells, *The Modernization of Corporation Law, 1920–1940*, 11 U. PA. J. BUS. L. 573, 582–83 (2009) (discussing how corporate law prohibited companies from holding stock in other corporations).

55. *See* Harris & Lamoreaux, *supra* note 54, at 11–12.

States did not mandate the incorporation of all American businesses.[56] Instead, for U.S. companies that did not like the rigidity of the corporation statutes, a trust business model offered governance from the robust body of trust law without the uncertainty and inflexibility of the new corporation statutes at the time.[57] Trusts gave a company more flexibility than the corporate statutes that were still evolving at the time.[58] Perhaps the most attractive perceived option in terms of flexibility was that, unlike a corporation, a trust could be formed privately, without any public filings.[59] As a result of optional incorporation, many American companies during this era chose the trust-based structure.[60] Trust ownership allowed American businesses to avoid the more onerous legal filing and governance requirements imposed by the incorporation laws and thus enjoy greater privacy from public scrutiny.[61] As a result, the business trust was popular in the United States as a "regulation-light"[62] alternative to the corporate form.[63] The most prominent examples of the trust's enduring popularity in the United States were the large monopoly trusts that enabled railroad companies and businesses such as U.S. Steel and Standard Oil to accumulate enormous private wealth, eventually leading to the "anti-trust" backlash at the end of the 19th century.[64]

As governance regimes of modern states and markets gained power in the 20th century, ironically, the same features of trust ownership that made trusts popular for businesses to expand and secure private property assets also made trusts useful for public and community ownership of assets. Severed title and trust governance proved to be popular forms for local and state land,

56. *Id.* at 13.

57. The New York Constitution of 1846, for example, indicated that "[c]orporations may be formed under general laws" but did not require businesses to incorporate. RONALD E. SEAVOY, THE ORIGINS OF THE AMERICAN BUSINESS CORPORATION, 1784–1855, at 183 (1982).

58. *See* Morley, *supra* note 31, at 2161.

59. *See* 1 FRANCIS WILLIAMS SANDERS, AN ESSAY ON USES AND TRUSTS, AND ON THE NATURE AND OPERATION OF CONVEYANCES AT COMMON LAW, AND OF THOSE, WHICH DERIVE THEIR EFFECT FROM THE STATUTE OF USES 15–16 (4th ed. 1824) (indicating that conveyances in trust had been made in secret since late medieval times).

60. *Id.*

61. *See* Morley, *supra* note 31, at 2157.

62. *Id.* at 2164.

63. *Id*.

64. *See* Herbert Hovenkamp, *The Antitrust Movement and the Rise of Industrial Organization*, 68 TEX. L. REV. 105, 160 (1989) (discussing late 19th century monopoly cases against those trusts).

water, and wildlife conservation.[65] The community land trust movement[66] also demonstrated that local associations could use trust ownership to remove land from speculative markets and gentrification, holding the land in trust for the benefit of low-income home owners and apartment renters[67] and, in the case of agricultural land,[68] for the needs of small farmers.[69]

These examples show how trust law continued to evolve over the last 500 years, bypassing restrictions and circumventing inequities in modern property regimes, making possible both large, for-profit monopoly business trusts and small, nonprofit land trusts.

C. Reforming Modern Property Regimes: Trust Law in a New Earth Era

The 21st century presents new equity problems for the practical tools of trust law: scientific warnings of global ecosystem collapse,[70] growing economic disparities,[71] and impending harms of anthropogenic climate

65. Erin Ryan, *Public Trust and Distrust: The Theoretical Implications of the Public Trust Doctrine for Natural Resource Management*, 31 ENV'T L. 477, 479 (2001) (discussing how the "new public trust" model was formed from conservationist principles).

66. John Emmeus Davis, *Origins and Evolution of the Community Land Trust in the United States*, *in* THE COMMUNITY LAND TRUST READER 1, 3 (John Emmeus Davis ed., 2010) (discussing the formation of the community land trust and examining how it has evolved over time).

67. *See* James Meehan, *Reinventing Real Estate: The Community Land Trust as a Social Invention in Affordable Housing*, 8 J. APPLIED SOC. SCI. 113, 113 (2014) (discussing how three cities in California used eminent domain to "seize and restructure mortgages" to help homeowners who were negatively affected by the housing market deflation).

68. Elizabeth Brabec & Chip Smith, *Agricultural Land Fragmentation: The Spatial Effects of Three Land Protection Strategies in the Eastern United States*, 58 LANDSCAPE & URB. PLAN. 255, 256 (2002); Cynthia Abbott Cone & Andrea Myhre, *Community-Supported Agriculture: A Sustainable Alternative to Industrial Agriculture?*, 59 HUM. ORG. 187, 187 (2000); GREG ROSENBERG & JEFFREY YUEN, LINCOLN INST. OF LAND POL'Y, BEYOND HOUSING: URBAN AGRICULTURE AND COMMERCIAL DEVELOPMENT BY COMMUNITY LAND TRUSTS 25 (2012); Marcia Caton Campbell & Danielle A. Salus, *Community and Conservation Land Trusts as Unlikely Partners? The Case of Troy Gardens, Madison, Wisconsin*, 20 LAND USE POL'Y 169, 170 (2003).

69. For a discussion of the urban land trust movement in the United Kingdom, see Susannah Bunce, *Pursuing Urban Commons: Politics and Alliances in Community Land Trust Activism in East London*, 48 ANTIPODE 134, 134 (2016).

70. *See* INTERGOVERNMENTAL SCI.-POL'Y PLATFORM ON BIODIVERSITY AND ECOSYSTEM SERVS., THE GLOBAL ASSESSMENT REPORT ON BIODIVERSITY AND ECOSYSTEM SERVICES: SUMMARY FOR POLICYMAKERS 24 (Manuela Carneiro de Cunha et al. eds., 2019) (noting the dangerous "unprecedented" decline of the natural world with species extinction rates accelerating and grave impacts on people around the world); *see also UN Report: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating'*, U.N. SUSTAINABLE DEVELOPMENT GOALS (May 6, 2019), https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/ (summarizing the 2019 report).

71. *See* WORLD INEQUALITY LAB, WORLD INEQUALITY REPORT 2018, at 58 (Facundo Alvareto et al. eds., 2018) (noting that in the United States in 1980, the richest 10% of the population held just under 35% of national income; by 2016, that share had risen to around 47%). The Report notes that as

change caused, in large part, by carbon dioxide (CO_2) emissions from burning fossil fuels, including by the electric power sector.[72] In the U.S. energy sector, CO_2 emissions increased in 2018.[73] Modern property regimes in the U.S. electricity sector—corporate investor-ownership of power utilities, electric grids, and rural electric cooperatives—are proving highly resistant to scientific warnings, citizen demand, and even financial incentives to lowering their carbon emissions.[74] For these legacy institutions of U.S. electricity provision, their investments in fossil fuel infrastructure, and the path dependency of their governance structures, make these institutions protect against stranded fossil fuel assets and unlikely to be agents of the necessary change to a low-carbon future.[75] Even when renewable energy technologies like solar and wind prove to be economically viable, equitable ownership models for communities are scarce and face crippling obstructions. [76] Indeed, both the Earth's atmosphere and the sun's energy appear to be 21st-century common property resources trapped in 20th-century private and public property regimes, resistant to financial and moral economy arguments from citizenry. As in the past, trust ownership, with its enduring and robust history of bypassing restrictions and overcoming inequities in dominant property regimes, has a role to play here.

The Solar Commons Community Trust Model demonstrates that the historical uses of trust law can be creatively adapted to serve 21st-century needs. Importantly, the SCCTM brings together two areas of trust law that have historically been kept separate in modern property regimes: (1) the

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wealth disparities have widened, so have differences in outcomes such that the rich now have a hugely better chance at education attainment, good health, and even longer life expectancy than the poor.

72. *See generally Reports*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, https://www.ipcc.ch/reports/ (last visited Apr. 14, 2023) (reporting the findings by the United Nations body for assessing the science related to climate change); *see also Frequently Asked Questions*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/tools/faqs/faq.php?id=77&t=11 (last updated Mar. 28, 2023) (reporting that the U.S. electricity sector contributed about 31% of total U.S. energy-related CO_2 emissions in 2022).

73. Perry Lindstrom, *U.S. Energy-Related CO2 Emissions Increased in 2018 but will Likely Fall in 2019 and 2020*, U.S. ENERGY INFO. ADMIN. (Jan. 28, 2019), https://www.eia.gov/todayinenergy/detail.php?id=38133.

74. Shelley Welton, *Electricity Markets and the Social Project of Decarbonization*, 118 COLUM. L. REV. 1067, 1072 (2018) (arguing that decarbonization of electricity sector should not be left to market logic but instead requires strong public purpose that needs a public voice in critical decisions).

75. *See* Amy L. Stein, *Breaking Energy Path Dependencies*, 82 BROOK. L. REV. 559, 559 (2017) (arguing that clean energy development faces an uphill battle given the one hundred years of "stickiness" associated with the legal and regulatory framework governing energy derived from fossil fuels).

76. Matthew J. Burke & Jennie C. Stephens, *Political Power and Renewable Energy Futures: A Critical Review*, 35 ENERGY RES. & SOC. SCI. 78, 78 (2018) (arguing that the renewable energy transition is fundamentally a political struggle and that efforts to shift from fossil fuels and decarbonize societies will not prove effective without confronting and destabilizing dominant systems of energy power).

public dimension inherent in public trust ownership of natural resources like air, water, and wildlife; and (2) the private dimension that characterizes the charitable purpose trust used by private foundations and nonprofit organizations to serve specific community needs. Legal scholars note that the types of private and charitable trusts managing community trust assets are not the same as the public trusts managing assets like wildlife, navigable waters, and air.[77] However, the SCCTM demonstrates how these traditionally separate areas of trust law can be creatively engaged in a common property framework using aspects of both private and public trust law.[78] In other words, the SCCTM severs ownership of renewable energy assets into legal and equitable title in order to bring together private and public property regimes. They can then function under the umbrella of a larger property interest essential to human and Earth well-being in the 21st century: common property.

The Solar Commons Community Trust Model uses public trust law in the terms of its trust agreement by defining the sun, which shines for everyone, as a natural resource like air or navigable waters, access to which is protected, at the state level, by the public trust doctrine. Solar Commoners thus assert their rights, as members of a state, to access the sun's electricity-generating capacity. To access their common property share of the sun's energy, Solar Commons trustees and beneficiaries would need permission from their private, investor-owned utility who controls the grid interconnection process in their electricity jurisdiction. Current U.S. solar energy access law builds on public trust law analogies,[79] arguing that the

77. Darragh Hare & Bernd Blossey, *Principles of Public Trust Thinking*, 19 HUM. DIMENSIONS WILDLIFE 397, 402 (2014). The authors note that while private and charitable trusts can help guide public trustees, comparisons should be treated as indicative, not literal.

78. The SCCTM builds on economic and legal arguments of the emerging "commons movement" which argues that current failures of states and markets to effectively and equitably govern natural and community resources call for new governing institutions that can bypass public and private property restrictions to better serve the common good. The Solar Commons model is one such new governing institutions in a growing commons sector. See the work of the 2009 Nobel laureate in economics, Elinor Ostrom. OSTROM, *supra* note 10, at 9. *See also* PETER BARNES, CAPITALISM 3.0: A GUIDE TO RECLAIMING THE COMMONS (2006); WESTON & BOLLIER, *supra* note 10, at 155. In the digital domain, see the work of the P2P Foundation, especially Michel Bauwens, Vasilis Kostakis, Stacco Troncoso, and Ann Marie Utratel. THE COMMONS TRANSITION PRIMER, https://primer.commonstransition.org (last visited Mar. 9, 2023) (compiling a catalog of documents supporting the assertion that using both private and public trust law in a common property framework is possible).

79. *See* Alexandra B. Klass, *Renewable Energy and the Public Trust Doctrine*, 45 U.C. DAVIS L. REV. 1021, 1064 (2011) (discussing how modern renewable energy projects' goals have shifted toward promoting public trust values for future generations while still trying to remain profitable); *see also* Lance Noel & Jeremy Firestone, *Public Trust Doctrine Implications of Electricity Production*, 5 MICH. J. ENV'T & ADMIN. L. 169, 179–80 (2015).

sun's energy capacity can be considered a common property (*res communis*) resource comparable to air or water with analogous access rights established in Roman civil law[80] and protected in the United States by the public trust doctrine,[81] which is also the basis of U.S. conservation law.[82] The three-party fiduciary relationships of trust ownership allow that a trustee can be either a natural person, a business entity, or a public body.[83] When the trustee is a

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> The public trust doctrine is a powerful legal tool in property law that requires the sovereign, as a trustee, to protect and manage natural resources. Historically, [it has applied] to navigable waterways and wildlife management. . . . [The] purposes of the public trust can ensure reasonable and timely development of renewable electricity as well as sufficient protection of trust resources.

Id. at 169. Solar access law in the United States emerged in the 1970s, the early days of the solar energy industry. Sophia Douglass Pfeiffer, *Ancient Lights: Legal Protection of Access to Solar Energy*, 68 A.B.A. J. 288, 289 (1982) (discussing how as of 1980, 15 states had "enacted easement statutes" modeled after the 1975 Colorado Solar Easement Law); *see e.g.*, John William Gergacz, *Legal Aspects of Solar Energy: Statutory Approaches for Access to Sunlight*, 10 B.C. ENV'T AFFS. L. REV. 1, 8 (1982) (discussing how the "limitations of the common law" in the area of access to sunlight have led to statutes being enacted to remedy this problem); GAIL BOYER HAYES, SOLAR ACCESS LAW: PROTECTING ACCESS TO SUNLIGHT FOR SOLAR ENERGY SYSTEMS 59 (1979).

80. English law only partially recognized Roman common property access rights in the Forest Charter of the Magna Carta:

> Roman civil law was reaffirmed by the English Magna Carta in 1215 AD, and redefined by English common law in 1641. English disfavor for "ownerless property" caused them to express the Roman concept in a less assertive way by assigning ownership of common property to the king, not for his private use, but as a trustee of these properties for the benefit of the people. In earlier times this arrangement resulted in the dispersion of privileges taken or allowed by royalty. Regarding waters, this introduced the concept of common easements for public navigation and fishing with an understanding that the Crown owned submerged lands and shorelines in trust for the people.

THE WILDLIFE SOC'Y, THE PUBLIC TRUST DOCTRINE: IMPLICATIONS FOR WILDLIFE MANAGEMENT AND CONSERVATION IN THE UNITED STATES AND CANADA 11 (2010) (citation omitted). In the United States, the Crown's common-property ownership applied at first to the 13 colonies and then, post revolution, was redefined and assigned to the states. Today's public trust doctrine evolved in U.S. courts and is now effectively a reinstatement of the full Roman civil law concept of *res* communis ownership. *See* Michael C. Blumm, *The Public Trust Doctrine - A Twenty-First Century Concept*, 16 HASTINGS W.-NW. J. ENV'T L. & POL'Y 105 (2010).

81. *See* Molly Selvin, *The Public Trust Doctrine in American Law and Economic Policy, 1789-1920*, 1980 WIS. L. REV. 1403 (1980) (stating how the public trust doctrine acts as a tool to safeguard public interest and community development); *see also* Sax, *supra* note 40, at 475.

82. Wildlife conservation in the United States is currently an area of enormous experimentation with regard to how public agencies, tribes, and local communities share governance of local public trust resources. *See* Cynthia A. Jacobson et al., *A Conservation Institution for the 21st Century: Implications for State Wildlife Agencies*, 74 J. WILDLIFE MGMT. 203 (2010) (noting that outside the United States, alternative governance models are based on private ownership of fish, wildlife, and habitat managed for personal or corporate gain).

83. *See generally* Jeffrey W. Henquinet & Tracy Dobson, *The Public Trust Doctrine and Sustainable Ecosystems: A Great Lakes Fisheries Case Study*, 14 N.Y.U. ENV'T L.J. 322 (2005) (identifying the various entities' participation in fishery management).

public body managing natural resource assets like sun, air, or water, the government trustee must be accountable to the beneficiaries of the trust: the public. The public, as the beneficiary of the trust, has legal rights to enforce accountability upon its government, typically through litigation.[84] In the case of solar energy access, the court would have authority under the public trust doctrine to limit grid owners' private property rights for the public interest. While public trust litigation has served to expand protection to water resources,[85] and is currently inching its way through U.S. courts to protect air against climate-changing pollutants from fossil fuel burning,[86] public trust litigation has not, to our knowledge, been used to enforce a citizen's right to access state-regulated electric grids for purposes of solar energy capture.[87] Theoretically, Solar Commons trustees and beneficiaries may exercise public trust claims requiring state agency accountability with regard to the protection of citizens' solar energy access rights.

More practically, the SCCTM already offers the *charitable purpose trust* as a quicker and more effective way around many obstacles facing low-income communities who wish to access their share of the sun's common wealth. Part III lays out the specific steps to create a Solar Commons charitable purpose trust around a solar array. As a practical tool, Solar Commons charitable trust ownership takes its place among a handful of creative, diverse community ownership strategies emerging around renewable energy technologies.[88] The SCCTM offers a vehicle for

84. These critical elements of the public trust doctrine were made clear in 1892 by the landmark United States Supreme Court case *Illinois Central Railroad Co. v. Illinois*, 146 U.S. 387 (1892). The Court supported the state of Illinois and acknowledged that, as the trustee of land submerged in navigable waters, the state was not empowered to relinquish the trust's assets in sale to the railroad because the state's role in holding these lands in trust for the public would have substantially impaired the public's rights and exceeded the state's authority as trustee of the land. *See* Sax, *supra* note 40, at 489–90.

85. *See* George Cameron Coggins, *Watershed as a Public Natural Resource on the Federal Lands*, 11 VA. ENV'T L.J. 1 (1991) (recognizing that water resource accessibility receives statutory security to ensure its protection); *see also* Joseph L. Sax, *The New Age of Environmental Restoration*, 41 WASHBURN L.J. 1 (2001) (arguing that environmental law has expanded its focus beyond the individual factory and discharge pipe to focus on biologically integral units, commonly a watershed, and thus ushering in a more regionally oriented management of land and water).

86. *See* JACQUELINE PEEL & HARI M. OSOFSKY, CLIMATE CHANGE LITIGATION: REGULATORY PATHWAYS TO CLEANER ENERGY (James Crawford & John S. Bell eds., 2015) (emphasizing the impact of climate change litigation); *see also* Mary Christina Wood, *Nature's Trust: A Legal, Political and Moral Frame for Global Warming*, 34 BOS. COLL. ENV'T AFFS. L. REV. 577 (2007) (chronicling the damage of climate change pollutants).

87. Burke & Stephens, *supra* note 76, at 85, 86 (discussing the current lack of legal and political remedies for solar energy obstruction).

88. *See* Niki Frantzeskaki et al., *Outliers or Frontrunners? Exploring the (Self-) Governance of Community-Owned Sustainable Energy in Scotland and the Netherlands*, *in* RENEWABLE ENERGY GOVERNANCE 101, 108–09 (Evanthie Michalena & Jeremy Maxwell Hills eds., 2013) (exploring several community-owned solar and wind ownership models in the European Union). The distributed nature of

underserved communities to hold their equitable property interests in the sun's energy and monetize that property as a source of revenue for community empowerment. Using a charitable purpose trust to own the common wealth of solar energy, low-income neighborhoods, we show, have a new device to improve and participate in the governance of their social and ecological well-being.

In summary, for centuries trusts functioned as a local governance structure to control and sustainably manage agricultural and energy commons[89] as subsistence resources for the majority population of feudal England. It is not a coincidence that this robust common property ownership vehicle is still used today to supply peat and wood resources to remaining pockets of rural energy users in the United Kingdom, as noted above. As one of the oldest forms of property ownership and business organization structure, trusts have also long been associated with charitable endeavors.[90] The following section details how a Solar Commons trust is created for both governance of a local solar asset and for charitable purposes.

The SCCTM demonstrates the versatility of trust law to create an equitable and enduring solution to current legal obstacles blocking low-income communities from accessing their fair share of the sun's energy-making capacity. Embedded in the SCCTM is the intention to engage community stakeholders to use the common resource of solar energy to serve low-income and underserved communities. The SCCTM is unique and innovative because it uses the trust legal structure to realize this charitable intention and it finds in the trust agreement a legal tool to secure creative local participation in the governance of equitable benefits that a community can derive from solar energy technology. These uniquely practical qualities of trust law make the Solar Commons Community Trust Model a highly useful tool for addressing equity issues in current U.S. community solar ownership; with its conceptual framework for serving the interests of common property holders, it is possible that the SCCTM may create a broader vehicle for 21st century legal reform such as trust law has offered in

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solar technology opens a field for new, local ownership models. The Solar Commons model remains unique because, to our knowledge, no one has yet used community trust ownership to hold solar energy assets or benefits. It is interesting to consider that Scotland, a country taking new measures to sustainably manage commoners' ancient turbary rights for energy provisioning, is also the country with the most diverse local community solar ownership structures in Europe. *See* ROBERTS ET AL., *supra* note 7, at 7, 63.

89. *See* Giangiacomo Bravo & Tine De Moor, *The Commons in Europe: From Past to Future*, 2 INT'L J. COMMONS 155 (2008) (analyzing European commons ownership from its feudal past to its 21st century aspirations).

90. Thomas E. Blackwell, *The Charitable Corporation and the Charitable Trust*, 24 WASH. U. L.Q. 1 (1938).

its resilient past. With the Solar Commons Community Trust Model, trust law becomes a tool to circumvent inequities of modern private and public property regimes. Through trust ownership, solar energy can be treated as a common property resource and communities of need can access its common wealth potential to serve their purposes.

III. THE SOLAR COMMONS TRUST MODEL IN PRACTICE

To better understand the legal structure of the SCCTM, we first identify the three basic components of a trust and then illustrate, with two scenarios, how these three components look in action when creating a Solar Commons trust.

A. Solar Commons Trust Creation: Engaging the Three Basic Components of a Trust

Although trusts may seem complex, there are only three key elements to their creation: (1) the settlor's intention to create a trust;[91] (2) property (known as the *res*) or interests to be placed in the trust;[92] and finally, (3) a beneficiary who enjoys the benefits of the trust *res*.[93] Trusts can serve a number of purposes from business to estate planning, including, as demonstrated by the SCCTM, charitable purposes. A charitable trust is a trust in which the settlor requires that the trust property shall be used for charitable purposes.[94] A key component in any type of trust is the fiduciary relationship that exists between the trustee and the beneficiaries.[95] Inherently embedded in the connection between the trustee and beneficiaries is a relationship that

91. *See* Rufford G. Patton, *The Nature of the Beneficiary's Interest in a Trust*, 4 U. MIAMI L. REV. 441, 422 (1950).

92. *Id*.

93. *See* UNIF. TR. CODE (UNIF. L. COMM'N 2010).

94. Charitable purposes are defined in each jurisdiction differently. Charitable trusts are typically monitored by the Attorney General in the state in which the benefiting charity presides. *See* RESTATEMENT (THIRD) OF TRUSTS § 94 cmt. (Tentative Draft No. 5, 2009) (noting that there may be a need for special interest standing because attorneys general lack sufficient means of enforcement); James J. Fishman, *Improving Charitable Accountability*, 62 MD. L. REV. 218, 224 (2003) ("The object of charitable trusts is to benefit the community rather than private individuals."); *What Attorneys General Do*, NAT'L ASS'N OF ATT'YS GEN., https://www.naag.org/attorneys-general/what-attorneys-general-do/ (last visited May 3, 2023) ("As chief legal officers of the states, commonwealths . . . and territories of the United States, the role of an attorney general is to serve as counselor to state government agencies and legislatures, and as a representative of the public interest.").

95. *See generally* RESTATEMENT (THIRD) OF TRS. (AM. L. INST. 2012) (describing duties the trustee owes to beneficiaries); *see also* UNIF. TR. CODE (UNIF. L. COMM'N 2010) (on the duty of loyalty to the beneficiaries).

includes a multitude of duties that the trustee owes to the beneficiaries.[96] In developing the SCCTM, an earlier model used a complex contractual legal structure to create "trust like" relationships. Because the goal of the model was to empower the communities served and to promote local protection and local stewardship of the trust assets, it quickly became evident that a trust-based model offered more of the necessary benefits without the complexity, inflexibility, volatility, and impermanence that can exist under a contractual model.[97]

Adapting the three components of trusts—the intention of the trust creator; the asset placed in trust; and the property rights and interests of the beneficiary—to serve the interests of low-income community empowerment through ownership of solar energy technology, the Solar Commons Community Trust Model offers an ownership vehicle that works with the existing governance regimes of U.S. power grid infrastructure. Without waiting for further policy changes to occur, low-income neighborhoods in many utility jurisdictions can use the Solar Commons model to participate in the benefits that come from the U.S. transition to a clean energy economy.[98] Trusts can hold a variety of assets and serve a multitude of purposes, including the rights to and benefits of solar energy. The intention behind creating trusts using the Solar Commons Community Trust Model is to capture some of the economic benefits created by the sun—which, in the commons context, "shines for everyone"—and distribute those benefits as common wealth (as opposed to commodity value) benefits for the common good.[99] Even though no one can own the sun, the rules to monetize and

96. *See* generally RESTATEMENT (THIRD) OF TRS. (AM. L. INST. 2012); *see also* UNIF. TR. CODE (UNIF. L. COMM'N 2010).

97. Summers, *supra* note 37 at 887.

98. *See* BREHM & LILLIS, FINANCIAL ANALYSIS, *supra* note 3, at 3. RMI analyzed the financial and environmental benefits of Solar Commons projects in three states (Arizona, Colorado, and Minnesota), for three system sizes (14.5 kW, 410 kW, and 500 kW) and under two rate options (community solar and behind-the-meter). Solar Commons provides significant benefits to the environment and to community beneficiaries (the trust) under all scenarios. Solar Commons further provides a positive net present value (NPV) to an impact-focused donor for all system sizes in Arizona. Solar Commons provides a positive NPV for community solar projects in Colorado and Minnesota, and for large behind-the-meter systems in Colorado. Financial performance of behind-the-meter Solar Commons projects are highly dependent on rate structure, location-specific solar production, and the impact of solar on a system host's monthly peak demand.

99. The distinction between common wealth and commodity property is an important one. The Solar Commons model uses trust relationships to maximize the benefits of solar energy and incentivize community stakeholders to creatively engage the potential of the community trust ownership structure to re-localize the value of solar energy from a *commodity property* (a small amount of market rate-savings measured on the electric meter and monthly utility bill of individual electricity users) to a *common wealth property* (a use-value that serves a subsistence community need in a meaningful and enduring way with an inherent obligation to the health of the larger natural world and future generations). The Solar

control the resource of solar energy have been shaped to serve the interests of the 20th-century electric utility model of monopoly, investor-ownership.[100] Corporate investment in U.S. power generation and grid infrastructure has created market advantage for fossil fuel industries and barriers to entry for renewable energy providers.[101] However, with today's distributed energy technologies that harvest their fuel from common property resources, like wind and solar energy, the grid is the site of enormous potential for diverse ownership structures and diverse benefit creation. These are benefits that go beyond the price of electricity as a commodity good to include the common wealth benefits of low-income community empowerment and the health of the larger natural world and future generations. Creating equitable access to the economic and ecological benefits inherent in energy resources of the sun and wind remains a civic task in building the 21st-century U.S. energy infrastructure system. Not unlike medieval peasants who used trust property arrangements to access their equitable common property energy interests in wood and peat despite the obstacles of the feudal property regime, low-income neighborhoods today can use the SCCTM to circumvent obstacles of the monopoly ownership

Commons Community Trust Model shows that solar-generated electricity can generate more value for underserved communities as a community trust asset than as a quantity of savings on an individual entity's electricity bill. More than a quickly traded market property that promotes liquidity, the commonwealth value of solar energy includes the potential to create an enduring community commitment that lasts for the 20 plus year life of the solar panel; thus, the trust can support a low-income household weatherization program, a community homeless shelter or food shelf, a paid youth internship program—the only limit on what the trust can support is the creative process that goes into the trust agreement when the settlor, the community-embedded trustee, and the low-income community beneficiary follow the general commons-enhancing standards of the SCCTM and collectively decide what will work best to serve, over time, the community's need. As a Solar Commons trust property, solar energy can be governed as a long-term relationship between a community beneficiary and a thoughtful trustee who has accepted a fiduciary duty to make the sun's common wealth contribute to the well-being of their local community. *See* MARY CHRISTINA WOOD, NATURE'S TRUST: ENVIRONMENTAL LAW FOR A NEW ECOLOGICAL AGE 313–18 (2014) (discussing the distinctions between the "commonwealth view" and "commodity view" of property).

100. In economic terms, the sun's electric energy capacity is a nonfrivolous, nonrivalrous, nonsubtractable good—meaning that using the sun's abundant energy to create electricity does not take the resource away from another user or diminish the energy resource itself. *See* Brownson, *supra* note 11; OSTROM, *supra* note 10, at 32 (further discussing this economic framework). However, access to the sun's energy for electricity generation in the United States is controlled, for the most part, by corporate, monopoly utilities who own the electric grid. Either one must have the capital to build a solar energy system that can be used completely disconnected from the grid, or one must get permission from the private grid owner to interconnect one's solar energy system to the grid. Thus, the grid owner is the gatekeeper for solar energy access for most urban and rural electricity users in the United States. Discussion of the technical and legal details involving U.S. grid infrastructure and ownership is beyond the scope of this paper. *See* GRETCHEN BAKKE, THE GRID: THE FRAYING WIRES BETWEEN AMERICANS AND OUR ENERGY FUTURE (2016) (outlining the socio-technical context of the U.S. grid).

101. *See* Stein, *supra* note 75, at 580, 593.

structure of the U.S. electricity grid to access their share of the sun's abundant common wealth potential.

B. Scenarios That Demonstrate Trust Creation Using the Solar Commons Community Trust Model

We offer the following two scenarios to demonstrate the structure and function of the SCCTM. First, based on our legal research prototyping a Solar Commons trust, we describe the general steps needed to create a Solar Commons trust and how the trust components—settlor, trustee, beneficiary, trust protector—work together to fulfill the charitable purposes of the trust agreement with solar energy. Second, we offer a hypothetical example of how a low-income community would use these steps to create their own Solar Commons trust.

1. Scenario One: General Steps to Create a Solar Commons Trust

Based on fieldwork to build Solar Commons prototypes,[102] the following iterable steps describe the process of trust creation using the SCCTM in utility districts with basic net-metering policies.[103] In step one, a community

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102. Prototyping research is an ongoing part of the Solar Commons Project, whose aim is to create the SCCTM as an innovative low-income community empowerment tool. Once the Solar Commons Trust Model has been sufficiently prototyped with community partners in the United States, best practices research will be published as a "*Do-It-Yourself Community Guide To Building A Local Solar Commons Trust*." The guide will include standards and legal templates, based on the prototypes, so that low-income communities can save on the legal requirements of executing a Solar Commons trust agreement. In the SCCTM prototyping, the founder and director of the Solar Commons Project is the solar facilitator working with community actors. Until the Solar Commons open-source legal templates are released to the public, parties using the SCCTM must seek authorization for the proprietary templates and resources (including, but not limited to a Creative Commons license). As the SCCTM is prototyped in the U.S., researchers will be using the Solar Commons nonprofit to determine the function and institutional needs of Solar Commons trust protectors.

103. *Net Metering*, SEIA, www.seia.org/initiatives/net-metering (last visited Mar. 10, 2023). The Solar Energy Industries Association describes net-metering thus:

> Net metering is a billing mechanism that credits solar energy system owners for the electricity they add to the grid. For example, if a residential customer has a PV system on their roof, it may generate more electricity than the home uses during daylight hours. If the home is net-metered, the electricity meter will run backwards to provide a credit against what electricity is consumed at night or other periods when the home's electricity use exceeds the system's output. Customers are only billed for their "net" energy use. On average, only 20–40% of a solar energy system's output ever goes into the grid, and this exported solar electricity serves nearby customers' loads.

During sunny hours of the day, most solar customers produce more electricity than they consume, thus relying on net-metering to export that excess power to the grid and reduce their future electric bills. However, some utilities perceive net-metering policies as lost revenue opportunities. SEIA points to cost

solar facilitator[104] will work with low-income community leaders to identify which community need and which community-based program serving that need can benefit from the funding of a Solar Commons trust. The solar facilitator and community leaders then seek a community partner willing to allow their roof or property to host a solar array generating clean electricity that would be used by their building and be measured on their electric meter. This "host/off-taker" can either (1) own the array itself and enter into a Solar Commons trust agreement that lays out the rules concerning how the array's benefits will be passed on to the trust; or (2) enter into an arrangement where the Solar Commons trust owns the array, in which case the Solar Commons trust will access and control the economic benefits directly. In either case, the host/off-taker would be compensated for any costs incurred in hosting the solar system. Together, the solar facilitator and community partners will go to local donors to raise the funds required to purchase and install the solar array.[105] The size of the array will depend on the off-taker's electric "load" (average annual amount of electricity consumed) which will often be in excess of the annual amount of electricity generated by the array.[106] The solar

benefit studies showing that, in fact, net-metering policies create a smoother demand curve for electricity and allow utilities to better manage their peak electricity loads. "By encouraging generation near the point of consumption, net metering also reduces the strain on distribution systems and prevents losses in long distance electricity transmission and distribution." *Id.* Evidence showing that solar adds value to local economies and the electricity system as a whole is offered in state-level studies (since states have diverse mechanisms to set net-metering policies). Many states have passed net-metering laws, while in other states the utilities' net-metering programs are offered voluntarily or as a result of regulatory decisions. Given these differences between state legislation, regulatory decisions, and implementation policies, the mechanisms for compensating solar customers (and thus bringing revenue to a Solar Commons trust) varies widely across the country. To view a selection of solar cost-benefit studies commissioned in a variety of states, see *Solar Cost-Benefit Studies*, SEIA, https://www.seia.org/initiatives/solar-cost-benefit-studies (last visited Apr. 21, 2023). Given the complexity of net-metering rules, this Article will not deal with net-metering "export rates" and other policies introduced to slow the development of distributed solar in the United States. For a further discussion of how the Solar Commons Community Trust Model works with a variety of net metering policies, see BREHM & LILLIS, SCALABILITY AND CONSTRAINTS ANALYSIS, *supra* note 3. This study also references a calculation tool that Brehm and Lillis built to determine how much revenue is available to a Solar Commons trust in diverse states based on inputs dependent on local net-metering rules. This tool will eventually be available for public use at https://www.solarcommons.org/.

104. The Authors note that, after the initial research and development phase of prototyping, creating standards, and testing digital peer governance tools for Solar Commons—currently underway in the Solar Commons Research Project at the Minnesota Design Center of the University of Minnesota—solar installers would be one likely group of community facilitators able to assist underserved communities in designing their own Solar Commons.

105. The SCCTM can also be used without a donation. While discussion of how the SCCTM works with a standard solar financing arrangement is beyond the scope of this Article, it is important to know that the model is also flexible for a standard solar financing arrangement.

106. The prototypical Solar Commons described here is a behind-the-meter arrangement. However, the Solar Commons Community Trust Model also works "in-front-of-the-meter", an

array and/or its net income stream generated will be considered the *res* of the Solar Commons trust, with the net income being calculated as follows: as the solar array produces electric power, measured in kilowatt-hours (kWh), the off-taker's electric meter tracks the amount of solar kWh captured[107] by turning the meter "backwards." These negative kWh function as credits to be used later in the day when the sun goes down and the host needs to draw electricity from the grid. The Solar Commons host/off-taker will only pay the utility for the "net" of these kWh on its monthly electric bill (total kWh of electricity used minus total kWh "credited" from the solar array multiplied by the retail rate of electricity). Before the Solar Commons host/off-taker sends the credited solar savings on its monthly electric utility bill to the Solar Commons trust, the host/off-taker will deduct all costs of hosting the array—a set calculation of monthly insurance, operations, and maintenance and administrative costs. The remaining monies become the host/off-taker's monthly deposit to the Solar Commons trust and become part of that trust's *res*. The trustee(s) of the trust, which can be the host/off-taker and a community organization recruited for that specific role,[108] will then distribute the monetary benefits to the beneficiaries in various ways in accordance with

arrangement that will be discussed later in the article. The amount of solar panels installed will depend on many factors, including the restrictions which the utility imposes on a host placing solar photovoltaic panels "behind the meter" of their home or business. As noted above in footnote 103, monthly surplus solar generation behind-the meter is typical with, on average, only 20–40% of a solar energy system's monthly output going into the grid. *See Net Metering*, *supra* note 103. This "exported" solar electricity immediately serves nearby customers' loads and is calculated in the solar host's electric bill as a credit that can be used to off-set the host's drawing from the electric grid at night or other times when the sun is not shining. Some utilities have *net metering rules* that allow a solar producer to generate 120% of their *annual* household electricity. For *annual solar surplus*, the utility reimburses the solar provider at a price per kilowatt hour established by the local regulatory agency. Readers should be aware that local utility laws for solar photovoltaic interconnection differ. The SCCTM requires the same legal considerations as other local solar energy projects in the same utility jurisdiction.

107. As noted above in footnote 103, in most states, net metering allows for a one-to-one credit for a host's solar electricity. In other words, the electricity a Solar Commons trust host/off-taker produces is equal in value to the electricity that host/off-taker receives from its utility, both valued at the retail rate. So, if the host/off-taker's solar array produces one kWh of electricity, the host/off-taker can directly reduce its electric bill by one kWh. If that kWh of solar electricity is generated when the host/off-taker does not need it, the electricity will go into the grid and be used by neighboring buildings. Regardless of whether the host/off-taker or its neighbors use the solar-generated electricity, it is the Solar Commons trust's host/off-taker who will be compensated with a bill credit for the full retail value of that kWh, which it can then use to offset its electricity consumption at a later time. Again, for a fuller discussion of utility push-back against compensating solar energy producers at the full retail rate, see *Net Metering*, *supra* note 103, for the position of the Solar Energy Industry Association (SEIA).

108. For example, the Solar Commons prototype in Tucson used a local community development financial institution (CDFI) who offered to manage the trust and its disbursement, without cost, to the local beneficiary. CDFIs, which exist in many underserved communities across the U.S., will usually know all the local community players involved in a Solar Commons project and thus make great partners for monitoring and distributing the trust funds.

the trust instrument. The trust instrument is a formal agreement executed by the settlor which lays out the conditions and principles for managing the solar energy *res*: it names the beneficiaries; outlines the expectations, duties, and responsibilities of the trustee; and appoints a trust protector. These conditions and governance principles are partially given by the SCCTM, which uses principles of a commons framework to ensure equitable outcomes. The SCCTM also allows flexibility for myriad possibilities that settlors, hosts/off-takers, and community participants can co-create in the trust instrument to ensure that local governance of their Solar Commons best fits their community.[109] The SCCTM includes open-source legal templates, shaped by the best practices research of the Solar Commons legal research team, and an open-source digital calculator tool allowing the host/off-taker to make monthly calculations that will be recorded in a database accessible to the Solar Commons trust protector and beneficiary for transparency and accountability in the co-governance of the Solar Commons trust.[110]

109. There are many possibilities for how a Solar Commons trust can be created and function in a community. For example, a Solar Commons host/off-taker can locate the solar arrays on rooftops of public buildings, apartment complexes, large retail stores, or office buildings. Off-takers can host ground-mounted solar arrays in parks, urban brownfields, down freeways, boulevards, light rail corridors, or in fallow agricultural fields and unused rural lands. Off-takers can be public or private entities; churches, schools, factories—any community entity which owns an electric meter and is willing to participate as a host (and possibly as a co-trustee as well) in making the benefits of solar energy work for the common good of its local community. Likewise, community leaders who function as co-trustees and trust beneficiaries of a Solar Commons trust can be as diverse as the communities they serve. It is a principle of the Solar Commons Community Trust Model that Solar Commons trusts be designed to look like the communities they serve. This is why the Solar Commons trust, like other trust instruments, offer flexibility to settlors, trustees, and beneficiaries to use a participatory process to come up with their own unique, local rules for equitably co-governing the trust asset.

110. Dr. Milun is working with computer science designers to create the open-source digital tools that make Solar Commons trusts accountable and transparent for local co-governance. SCCTM researchers envision a public-facing digital Solar Commons dashboard that will show how the sun's common wealth in sunlight is converted to usable electricity (kWh), and then to a market commodity (local retail price for solar electricity), and then back into common wealth (trust funds) and then into a common good that benefits the local community (beneficiaries' use of the funds). It is useful to think of the conversion of common wealth to market wealth and then back to common wealth as a kind of "translation" of value from one economic regime (gift economy) to another (market economy) and then back again (to gift economy). The Solar Commons trust agreement, the community-created rules by which the trust funds are governed, follow principles and standards established by the Solar Commons license. These general principles and standards assure that the trustees manage the trust funds to create a "common good" which keeps the sun's common wealth useable by the community as a form of common wealth. For a general discussion of common wealth trusts, see Peter Barnes, *Common Wealth Trusts: Structures of Transition*, GREAT TRANSITION INITIATIVE (Aug. 2015), http://peter-barnes.org/article/common-wealth-trusts-structures-of-transition/. For a discussion of how gift economies differ from and intersect with market economies, see BARNES, *supra* note 78; DAVID GRAEBER, DEBT: THE FIRST FIVE THOUSAND YEARS (2011).

It is important to note that the SCCTM functions with existing utility rules in either a behind-the-meter or in-front-of-the-meter (solar garden) arrangement. This is demonstrated by the independent 2018 analysis of the Solar Commons financial model by the Rocky Mountain Institute which reports a positive net present value for Solar Commons built in three utility jurisdictions (Arizona, Colorado, and Minnesota), at two scales (14.5 kW and 500 kW), and in two positions (behind-the-meter and in-front-of-the-meter).[111] The SCCTM users will also have access to the digital tool built by the Rocky Mountain Institute to calculate inputs of net-metering and other state and utility jurisdiction policy variations to determine the income stream that a Solar Commons trust array will produce for its community beneficiary.[112] The solar electricity rates and utility rules for solar are so complex, in flux, and varied depending on the specific utility jurisdiction that a discussion of such is unnecessary here because the SCCTM is designed to transcend these variations.

2. Scenario Two: A Hypothetical Community Using the Solar Commons Community Trust Model

The following hypothetical example will demonstrate how the SCCTM innovates trust ownership so that a low-income community can gain control of the sun's clean energy resources and create an empowering community impact with scaling capacity for other low-income communities in the United States today.

A community group[113] in City A wishes to support or create a local program that empowers underserved members of their community. Working with a solar installer,[114] the group finds a potential host/off-taker to support this charitable undertaking. The potential off-taker offers the use of a roof of its building for a solar array. Together with the solar installer, the host calculates the size (kW) and costs (e.g., construction, operation and management, insurance) to build and maintain a photovoltaic system that would feed solar-generated electricity through the building's meter. This

111. *See* BREHM & LILLIS, FINANCIAL ANALYSIS, *supra* note 3, at 3.

112. The Rocky Mountain Institute's calculation tool is available on the Solar Commons Project research website at http://solarcommonsproject.org.

113. Examples would include: local club or business, school, nonprofit, religious organization, or community association.

114. In its prototyping phase, the facilitator of the SCCTM will be the owner of the SCCTM proprietary interests (Creative Commons license and trademark). Eventually, once the prototyping has informed sufficient best practices research, a Community Guide to Solar Commons will outline the role of SCCTM facilitator so that solar installers and other community members can take on the tasks of iterating the SCCTM through an open-source license.

clean, solar electricity would supply the off-taker's building with, for example, 80% of its annual electricity needs. The solar installer helps the off-taker calculate the average amount of kWh that would be net-metered monthly on its electric meter.[115] These calculations will provide the sum amount of solar savings the off-taker will see on its monthly electric bill. After subtracting all the costs of managing the solar array, it will be determined how much of those monthly savings will be placed into the Solar Commons trust to benefit the designated charitable organization. With this information—cost of buying and installing the array, costs of hosting the array, monetary benefits of array going to the trust, beneficiary program receiving the trust funds, names of community stakeholders to serve as trustee and trust protector, governing principles and duties and obligations of all stakeholders—the community group can approach a funder.

If the funder donates money, this can be the step in the process where the Solar Commons trust can be qualified as a charitable trust and formalized through a trust agreement.[116] The trustees (who may be the hosts/off-takers and/or members of the community group) will continue their work with the installer to build the array and deliver the solar savings to the beneficiary following the directives of the Solar Commons trust agreement. If the funder is a community development bank or another financing entity willing to work with the off-taker/host and community group in a loan arrangement, this too can be set up by formalizing the Solar Commons trust to pay off the loan through a portion of the net-metered solar savings while passing the remaining savings on to the beneficiary.

In this illustrative SCCTM, the off-taker/host serves as a trustee; the array becomes the *res*; and the trust beneficiary is the charitable organization. The community group who has curated these arrangements may, in some instances, become a co-trustee or even a trust protector, continuing their local governance role. In establishing the Solar Commons trust, the ownership

115. This illustration is an example of a behind-the-meter (net-metered) Solar Commons. Variations in these calculations will come from the solar capacity of the building's geographical location and climate, the slope of the roof, the net-metering rules and solar pricing options operating in its utility jurisdiction, and any monthly solar interconnection fees charged by the utility.

116. Once the off-taker and charitable organization are identified, the intent of executing a Solar Commons trust agreement can be formalized. The Solar Commons trust agreement outlines the duties of the trustee (e.g., to install and interconnect the solar array, to monetize the solar bill credit savings, and to deliver benefits to the trust beneficiary for a set number of years). The trust agreement provides details about what to do in specific contingencies and notes the right of the host/off-taker to deduct from the net-metered solar savings all costs—operation and management, insurance, technical repairs—before sending the beneficiary their monthly or yearly benefits. Application should be made to the IRS to obtain charitable trust or private foundation status. As noted, open-source templates of Solar Commons trust agreements laying out the details of the model will be made freely available to communities once the Solar Commons project prototyping is complete.

interests of the solar array have been severed. The host/off-taker, as trustee, owns the solar array's legal title and the charitable organization owns the equitable title to the solar array's benefits. Together these community partners will be able to access the common wealth of the sun's energy and, for the 30 plus year life of the solar technology, support an enduring community benefit. In many ways, these solar commoners are like their medieval legal ancestors who used trust arrangements to equitably distribute local peat and wood resources and sustainably steward English bogs and forests as energy commons centuries ago. As verified in the study done by the Rocky Mountain Institute, with such a simply structured model, it is clear that the SCCTM has the potential to "provide[] significant benefits to the environment and to community beneficiaries (the trust) under all scenarios."[117] As it scales to serve communities in rural and urban America, the SCCTM will have effectively utilized trust law to address a social inequity by bridging the solar income gap.[118]

IV. THE SOLAR COMMONS TRUST MODEL LEGAL RAMIFICATIONS AND POLICY BARRIERS

The Solar Commons Community Trust Model should be viewed as a tool for sustainable social innovation. This Part brings attention to specific legal ramifications of using SCCTM based on the authors' experience prototyping Solar Commons in the United States. In the first part we address fiduciary duties, the creative potential in the role of the trust protector, interfacing with local utility law, and finally the advantages of trust over contract law for the purpose of delivering community benefit through community solar ownership. In the second part, we highlight ways which a Solar Commons trust can circumvent the barriers to low-income community solar access in current grid ownership policies and state regulatory structures.

As demonstrated in the historical examples of trust ownership over the past 500 years, trust law offers a unique ownership strategy to gain control of an asset despite the dominant property rules of its time. In the 21st century, where solutions to key ecological and social crises depend on transitioning to renewable energy and creating equitable access for all to the benefits of the coming renewable energy economy, we demonstrate how trust law has the potential to be a robust tool for equitable sustainability transitions. The SCCTM enables underserved communities themselves to gain local control of distributed, renewable energy assets and, through trust co-creation with

117. BREHM & LILLIS, FINANCIAL ANALYSIS, *supra* note 3, at 3.

118. *See* MUELLER & RONEN, *supra* note 2, at 1.

community stakeholders, to use the trust agreement process and structure to innovate local participation in and governance of the common wealth in the trust asset.

A. Addressing Legal Ramifications of the Solar Commons Community Trust Model

While simple in structure, there are potentially complex legal ramifications of the SCCTM which should not go unexamined. One of the major considerations that should be discussed by the solar facilitator, potential donors, off-takers, and beneficiaries prior to formalizing their trust relationship are the fiduciary duties the off-taker will owe to the beneficiaries as the trustee, and the inherent conflict of interest that can be present.[119] An off-taker, as trustee will owe, *inter alia*, a duty of loyalty, "to administer the trust solely in the interest of the beneficiary."[120] However, the off-taker has a duty of loyalty to its own organization as well and by having physical possession of the array on its property, that duty may be at cross-purposes with providing the solar array benefits to the beneficiaries. As such, a trust relationship, like most relationships, can have its periods of disenchantment. While judicial enforcement is available when trustees fail to uphold their duties, it can be ineffective and cost prohibitive for beneficiaries to seek court intervention. One way the SCCTM avoids potential pitfalls is to appoint a trust protector who can carry out functions specific to a Solar Commons trust.[121] A trust protector has limited authority over the trust.[122] Unlike trustees that have a duty to the beneficiaries, the trust protector acts as an intercessor when necessary.[123] Generally, a trust protector is a neutral third

119. An off-taker may receive additional benefits outside of the clean, solar electricity they now have for their building and the avoided carbon pollution they would have emitted into the atmosphere, therefore it is important to make sure that no conflict of interest arises from these benefits. Additional benefits for an off-taker may include retaining the Renewable Energy Credits which, once a stable carbon market has developed, may be traded to provide additional income to the off-taker. The off-taker may also enjoy a lower price for their electricity negotiated with the trust as an incentive for not charging leasing fees for the use of their roof. In other words, the Solar Commons trust may negotiate, in the trust agreement, the amount of money the off-taker will deliver to the trust. This provides a win-win-win situation for all parties: the off-taker has reduced their electricity costs, is now helping to mitigate climate change, and is supporting a low-income neighborhood charity or empowerment program; the settlor has been able to support multiple charitable missions while receiving a positive net present value for its investment.

120. RESTATEMENT (SECOND) OF TRS. § 170(1) (1959); *see also* UNIF. TR. CODE § 802(a) (UNIF. L. COMM'N 2000) ("A trustee shall administer the trust solely in the interests of the beneficiaries.").

121. Richard C. Ausness, *The Role of Trust Protectors in American Trust Law*, 45 REAL PROP TR. & EST. L.J. 319, 321(2010).

122. *Id.* at 352–53.

123. *Id.* at 332.

party or organization (not the settlor, beneficiary, off-taker, or trustee) who is appointed to exercise one or more powers affecting the trust and the interest of the beneficiaries by providing oversight of certain decisions which allows for a degree of flexibility not easily accommodated without one.[124] A trust protector's authority may include the ability to appoint additional or successor trustees, the ability to modify when distributions are made, or the ability to modify or terminate the trust.[125] The concept of a trust protector is just another example of how trust law continues to evolve.[126]

The language of a trust instrument together with the appointment of a trust protector provide the flexibility needed to handle the very unique situations that are bound to be encountered. It is important for all parties to consider the roles of settlor, the host/off-taker, the trustee, the beneficiaries, and the trust protector when building a Solar Commons trust.

While using the SCCTM can provide a multitude of legal and practical benefits such as asset protection, community engagement, and legal enforcement for all parties involved, parties must ensure they are familiar

124. *Id.* at 352.

125. *Id.* at 329.

126. As Solar Commons trusts become more widely used across the United States, the need may arise for state-by-state institutions that can take on the tasks of trust protector and monitor the solar trust arrangements in their state jurisdictions. It remains to be seen what Solar Commons trust protector institutions would look like and what tasks they would do. This is currently the work of the Solar Commons Research Project, which is prototyping, creating open-source legal templates, digital tools, and best practices for Solar Commons to become robust ownership models for low-income community trust solar in the United States. Again, the historic flexibility of trust law suggests that, with climate change and energy transition, there will be a need and opportunity to connect the benefits of the renewable energy transition to the needs of climate change refugees and others who will be disproportionately suffering. It is instructive to remember that in the 20th century, trust law provided a creative arena to meet the needs of community groups working in the under-developed legal arena of environmental protection. In this context, conservation trusts were created to hold easement property rights over buffer zones and thus control how land could be used near fragile wetlands and waterways to avoid contamination by harmful chemical fertilizers or other developments that work against the public interest. Such buffer zone easements become trust property held by counties, land trusts, and other entities acting as trustees. Around the country, trust institutions have been created to serve equitable, public interests that are not sufficiently served by the laws of the time. In the area of affordable housing, urban and rural community trusts have arisen to hold property outside the speculative commodity value of the marketplace, thus helping low-income communities hold their neighborhood common wealth values when new improvements—light rail corridors, new housing developments—would have otherwise put these neighborhoods at risk of gentrification. *See supra* text accompanying notes 65–69 (discussing 20th-century U.S. conservation and housing trusts). Solar Commons trust protectors should be viewed in this category of new trust institutions arising to address inequities and protect public and common property goods that have are not adequately served by current laws. Like these creative trust institutions, Solar Commons will also provide new local governance opportunities to emerge among diverse property owners: state authorities managing public property, market actors controlling private property, and local citizens co-governing local resources for intergenerational equity and local benefit. For a discussion of the legal innovations that arise with commons governance strategies, see WESTON & BOLLIER, *supra* note 10.

with local laws regarding public utilities. The SCCTM is typically structured "behind the meter" when the array is donated to the trust so that the off-taker's interaction with the local utility company remains the same as any other local solar energy user interconnected to the power grid.[127] Innovating community solar with the SCCTM allows community solar stakeholders to avoid unnecessary contractual agreements, negotiations, and regulations that otherwise might be relevant to the power grid.

The benefits of using trust law over a contractual agreement in designing Solar Commons should be emphasized. As previously discussed, an alternative arrangement to a trust-based model would have been to create these relationships by contract; however, the need for contract negotiation is greatly diminished when utilizing the SCCTM since many of the desired terms are already incorporated as fundamental principles of trust law. For example, if the term fiduciary duty ever finds its way to a negotiation table for any type of contract, the goal for the party where such a duty would be imposed is to ensure they are held to a lesser standard in order to protect their interests. In a contractual structure, any and all terms are negotiable. In trust law, while the fiduciary duties of a trustee may be limited by choice, they are rarely negotiated because fiduciary duties are embedded in foundational principles of the trust structure. Aside from fiduciary duties, other considerations and items for negotiation in a contractual Solar Commons arrangement would be premises liability issues, reversionary rights, maintenance and insurance costs, and identification of the intended third-party beneficiaries to the contract. All of the considerations mentioned above are addressed under the SCCTM and available without the need for negotiation.

Another advantage of trust law is seen in how Solar Commons beneficiaries, who hold the legal right to benefit from the trust assets, can enforce their legal rights as necessary.[128] The fiduciary relationship between the trustee and beneficiaries ensures the trust's charitable purposes are upheld.[129] In addition, if the trustee fails to provide the benefits of the trust to the beneficiaries in accordance with the trust agreement, the beneficiaries are permitted to request court supervision of the trust and mandate the trustee provide the benefits owed to the beneficiaries.[130] Under a contractual solar model structure, beneficiaries' rights would need to be established by

127. *See* discussion *supra* note 103 (explaining the "net-metering" billing mechanism used by grid-integrated solar energy arrays).

128. *See generally* UNIF. TR. CODE (UNIF. L. COMM'N. 2010); RESTATEMENT (THIRD) OF TR. (AM. L. INST. 2012).

129. *Id*.

130. *Id*.

proving they were intended third-party beneficiaries, which are facts and circumstances dependent, thereby making enforcement by the beneficiaries less certain.[131] The rights of third party beneficiaries under a contract can vary greatly from one jurisdiction to the next and parties must establish standing prior to bringing a claim against an off-taker. In contrast, a trust-based model establishes automatic standing for trust beneficiaries and can implement conditions and procedures to ensure issues involving beneficiaries do not go unaddressed due to their financial constraints.[132] Another major advantage of the Solar Commons trust is the "ease of conveyance."[133] The transfer of ownership of the *res* property to a different off-taker, or, as long as the trust agreement provides for it, to different classes of beneficiaries, can greatly lessen the complexity of the transfer of ownership of the array and its benefits.[134]

In contrast, a contract-based arrangement would likely not provide the same level of ease.[135] Such a transfer, under the contract model, would need to occur as an assignment and/or release of rights and obligations by all parties to the contract.[136] Transferring the legal title of the trust property can be done simply with the appropriate documents prepared by an attorney, without a court proceeding or the possibility of contentious negotiations that can occur under other ownership arrangements.[137] Taken together with the philanthropic nature of the parties involved, it is evident that the SCCTM provides the necessary terms and basic principles that no contract-based model can achieve.

B. Avoiding Policy Barriers with the Solar Commons Community Trust Model

The following section demonstrates how the SCCTM addresses both the practical and legal barriers low-income communities face when attempting to engage in solar energy projects. Three barriers that all low-income communities commonly face when attempting to engage solar energy are: (1) there is lack of resources to build their own array; (2) available government assistance programs often lack sufficient funding, sustained consistency, and conceptual vision to effectively help those in need; and

131. *See generally* Summers, *supra* note 37, at 898; *see generally* Patton, *supra* note 91.
132. *See* Morley, *supra* note 31, at 2192.
133. *See generally* Summers, *supra* note 37; Patton, *supra* note 91.
134. Summers, *supra* note 37, at 885.
135. *Id.*
136. *Id.*
137. *Id.*

(3) investor-owned utilities currently challenge a key policy mechanism used by all U.S. solar programs—net-metering. Below we discuss these policy barriers and the ways they are addressed by the SCCTM.

Low-income communities lack resources because they cannot afford to purchase and maintain their own solar arrays. The Solar Commons trust model circumvents this barrier by establishing a donation-based model whereby community facilitators can locate and identify local donors and financiers with philanthropic aspirations to support underserved communities and alleviate needs of the impoverished and underprivileged in their communities.[138] In fact, the Rocky Mountain Institute's scalability analysis of the Solar Commons model recognizes a contribution potential of $100 billion available for Solar Commons projects.[139] The trust structure of the Solar Commons trust model provides a viable and attractive donation vehicle because the property, once transferred, belongs to the trust which, along with its *res*, is shielded from legal actions against the donors, off-takers, and beneficiaries of the trust.[140]

Second, while it is well-known that federal government energy assistance programs available to low-income communities are insufficient for those in need,[141] it is only recently that solar energy has been proposed to help low-income families reduce their energy burden and move toward greater self-sufficiency.[142] The Solar Commons Community Trust Model contributes significant societal benefits to such government-sponsored energy assistance programs by addressing some of their key weaknesses. One significant weakness is that, even when fully funded, such programs are insufficient to meet the needs of all qualified households.[143] Donation-based

138. *See* Richard C. Ausness, *The Role of Trust Protectors in American Trust Law*, 45 REAL PROP. TR. & EST. L.J. 319, 327 (2010); *see also* UNIF. TR. CODE § 603 (UNIF. L. COMM'N 2010) (describing the powers of the settlor and the beneficiaries to direct the trustee).

139. *See* BREHM & LILLIS, SCALABILITY AND CONSTRAINTS ANALYSIS, *supra* note 3, at 6.

140. *See generally* Morley, *supra* note 31, at 2152, 2167.

141. The long-standing insufficiency of the two key federal Low-Income Weatherization (WAP) and Low-Income Home Energy Assistance Programs (LIHEAP) is well established. For a discussion of "the sources of decline and eventual transformation of these initiatives into largely symbolic adjuncts to state social welfare systems," see Lorie Higgins & Loren Lutzenhiser, *Ceremonial Equity: Low-Income Energy Assistance and the Failure of Socio-Environmental Policy*, 42 SOC. PROBS. 468 (1995).

142. For a more recent discussion of how incorporating solar energy into federal energy assistance programs can improve the effectiveness of using public resources to provide societal benefits, see AMIT RONEN ET AL., GW SOLAR INST., CAN ELECTRICITY RATE SUBSIDIES BE REALLOCATED TO BOOST LOW-INCOME SOLAR? (2016) (arguing that given the proven ability of residential solar systems to decrease monthly electric bills, rooftop solar could help relieve this disproportionate energy burden and become a source of ongoing wealth creation in lower-income communities more effectively than existing rate subsidy programs).

143. LIHEAP is a block grant program through which the federal government gives states and other jurisdictions to fund local energy assistance programs. For a report on the consistent shortfall in

or self-financed Solar Commons would thus contribute a further funding source for low-income energy assistance in the United States. Another key weakness of existing energy assistance programs is that, while they provide needed utility bill assistance to individual households to cover energy costs and keep utilities running, they do so regardless of how well those individual homes are insulated. Thus, the Low-Income Household Energy Assistance Program (LIHEAP) pays utility companies directly for the high heating or cooling charges that qualified low-income households see on their bills. However, LIHEAP does this without fixing the true cause of the household's high energy use: badly insulated buildings. If federal LIHEAP funds were used to directly fund a Solar Commons array, on the other hand, the Solar Commons trust fund would not deliver its solar savings as credits on individual low-income household's electricity bills. Rather than continue this inefficient practice, a Solar Commons trust fund would go to a program that weatherized the homes of low-income families using the same vetting institutions and processes already in place for LIHEAP delivery throughout the United States. This is exactly what the Solar Commons prototype in Tucson, Arizona did.[144] Thus, a government program like LIHEAP may be used to fund Solar Commons community trusts, but the trust would not be designed to support individual low-income household electricity bill savings unless the root problem of inadequate housing had first been corrected through energy efficiency upgrades.

An additional weakness of current energy assistance programs like LIHEAP is that they provide state and federal dollars directly to the utility billing the low-income household, regardless of whether that utility is using fossil fuels or nuclear energy to generate electricity. In an equitable and urgent transition to a clean energy future, taxpayer subsidies should not be conceptually and programmatically separated from the fuel sources used to generate energy. Such an arrangement does not incentivize utilities to be energy efficient or to adopt clean energy generation technologies. Finally, it should be remembered that government energy assistance programs can have rigid qualifying rules that leave many low-income households outside the assistance zone; government programs can also be unpredictable and vary

funds for qualified households, see EMILIE STOLTZFUS & JULIE WHITTAKER, CONG. RSCH. SERV., THE LOW-INCOME HOME ENERGY ASSISTANCE PROGRAM (LIHEAP): PROGRAM AND FUNDING ISSUES 6–8 (2003).

144. The Solar Commons prototype operating in Tucson, Arizona makes an existing low-income household weatherization program operated by the Tucson Urban League a beneficiary of the trust's funds. *SC 1.0 Tucson, Arizona*, SOLAR COMMONS PROJECT, https://solarcommonsproject.org/tucson-arizona/ (last visited Apr. 21, 2023).

greatly based upon the agenda of each administration.[145] The Solar Commons trust model offers a steady income stream for low-income community benefit, with or without government assistance or links to other clean and efficient energy practices.

The third policy barrier facing low-income community use of solar energy comes from utility pushback against a key policy mechanism used by all U.S. community solar models including Solar Commons: net energy metering.[146] Utility pushback against the increased efforts by individuals, communities, and federal and state governments to generate and capture solar energy at the community level, whether for direct community use or monetization, often involves arguments claiming that such community programs in fact harm low-income communities. The harm, it is argued, arises because net-metered billing does not adequately account for the true costs of solar and thus inadvertently passes costs on to non-solar customers which include low-income households.[147] Advocates of net-metering argue that such solar providers are actually helping utilities (and therefore all rate-payers) avoid additional costs of adding new electricity generation assets as older and dirtier coal generation plants are taken offline. While it is beyond the scope of this Article to discuss the intricacies of these net-metering policy arguments, there are several reasons why we feel that the Solar Commons community trust ownership model can overcome current pushback against the net-metering policies that make solar energy, and Solar Commons specifically, cost efficient. First, it is important to recognize that criticism of net-metering benefits investor-owned utilities with assets in coal, gas, and nuclear power plants. Of the three types of electric utility ownership

145. STOLTZFUS & WHITTAKER, *supra* note 143.

146. *See supra* note 103 and accompanying text for a full discussion of net-metering.

147. Utility companies and regulators frequently allude to negative economic impacts of the very net energy metering (NEM) programs that enable distributed community solar programs to exist, thereby justifying utility efforts to decrease, cap, or suspend NEM programs across the country. *See* Stephen Comello & Stefan Reichelstein, *Cost Competitiveness of Residential Solar PV: The Impact of Net Metering Restrictions*, 75 RENEWABLE & SUSTAINABLE ENERGY REVS. 46 (2017). Utility companies and regulators claim NEM programs have the potential to harm low-income ratepayers because NEM removes customer–generators from the rate base and leaves low-income rate payers holding the bag and footing the bill when it comes to power grid maintenance costs. Baker, *supra* note 6, at 211–12. Advocates of NEM argue that, in fact, net-metered solar customers put clean energy into the utility-owned grid and are therefore *saving* money for utilities who thus avoid the costs of adding new generation assets as the population grows and as coal plants are taken offline—the costs associated with public health impacts of fossil fuel generation and of future carbon accounting, etc. All such avoided costs, NEM advocates argue, bring down the cost of electricity for rate-payers, including low-income rate-payers who do not own solar energy. In the United States, support for and opposition to NEM policies are increasingly politicized positions. *See* Leah C. Stokes & Hanna L. Breetz, *Politics in the U.S. Energy Transition: Case Studies of Solar, Wind, Biofuels and Electric Vehicles Policy*, 113 ENERGY POL'Y 76, 76–86 (2018) (discussing the increasing politicization of renewable energy policy).

operating in the United States today—investor, municipal, and cooperative—investor-owned utilities dominate the U.S. electricity sector, serving three out of every four utility customers.[148] Because they remain heavily invested in fossil fuel and nuclear power plants, increases in solar and wind generation not owned by these dominant utilities represent lost revenue and stranded assets on their electric grids. It is no wonder that any policy enabling increases in distributed solar energy generation and ownership presents a threat to this 20th-century, investor-owned business model. However, if we consider that utility arguments against community (and residential) solar programs come in a moment when there is no charge on utilities or the fossil-fuel industry generally for using the air (a common property resource belonging to all breathers, high- and low-income alike) as a dump for greenhouse gas pollutants and their health impacts, another economic variable emerges. Once a carbon fee is factored into the U.S. energy economy, utility arguments against community solar programs and their net-metering requirements will need to be reframed.[149] The Solar Commons Community Trust Model is one of many efforts to equitably value and protect our common property interests in shared Earth resources—both clean air and sunshine for clean electricity generation.[150]

There is further reason to think that community solar programs using strong net-metering policies will find more and more political support from federal and state actors. As noted above, in recent years there has been increased interest within the United States to use the common resource of the sun to benefit low-income households through community solar programs.[151] The U.S. Department of Energy recognized this by hosting a "Solar in Your Community Challenge" competition between 2016 and 2018 with the goal of

148. The U.S. Energy Information Administration (EIA) reported that in 2017 investor-owned utilities serve three out of every four utility customers in the United States. For a summary of the report, see Kevin Randolph, *EIA: Investor-owned Utilities Served 72 Percent of US Electricity Customers in 2017*, DAILY ENERGY INSIDER (Aug. 19, 2019), https://dailyenergyinsider.com/news/21198-eia-investor-owned-utilitiesserved-72-percent-of-us-electricity-customers-in-2017/. See the full report at U.S. ENERGY INFO. ADMIN., ELECTRIC POWER 2021 (2022), https://www.eia.gov/electricity/annual/pdf/epa.pdf.

149. Todd Levin et al., *The Long-Term Impacts of Carbon and Variable Renewable Energy Policies on Electricity Markets*, 131 ENERGY POL'Y 53 (2019) (arguing that a carbon tax is the most system cost-efficient means for reducing carbon emissions and noting that growth in variable renewable-energy infrastructure requires specific policy support).

150. For a review of renewable energy policies around the world connecting the common good of stabilizing our shared climate system and equitable access to the free and abundant sources of clean energy, see INT'L RENEWABLE ENERGY AGENCY, INT'L ENERGY AGENCY & REN21, RENEWABLE ENERGY POLICIES IN A TIME OF TRANSITION 11–12, 28–29 (2018). These authors note the importance of the kind of net-metering policies that support distributed generation of solar energy in the manner that underpins Solar Commons and U.S. community solar programs generally.

151. *See* Baker, *supra* note 6, at 218.

expanding solar energy access to all Americans including those in moderate- and low-income households.[152] Furthermore, state legislatures throughout the United States are also attempting to provide viable pathways to community participation in community solar and community energy programs, all of which require strong net-metering policies.[153] An analysis of the current success of Minnesota's net-metered community solar program, which has installed the greatest megawatt capacity of community solar in the United States, supports the argument that (1) "all customers (subscribers or not) are seeing financial benefits from community solar" and that (2) by enabling individuals and public institutions to save money with community solar, the field of those who benefit from solar has been expanded.[154] The Rocky Mountain Institute's analysis of the Solar Commons community trust financial model demonstrated that it would produce a net positive present value for a donor using the rules of Minnesota's community solar program.[155] As part of the above-mentioned U.S. Department of Energy's "Solar in Your

152. *See Solar in Your Community Challenge*, *supra* note 7. The Solar Commons Project was a finalist in this competition.

153. Baker, *supra* note 6, at 211 n.1. For a summary of state programs, see *Community Energy Projects*, SHARED RENEWABLES, http://sharedrenewables.org/community-energy-projects (last visited Apr. 19, 2023). *See* NC CLEAN ENERGY TECH. CTR. & MEISTER CONSULTANTS GRP., *supra* note 147, at 3 ("As of August 2014, there were 57 active or proposed utility-offered community solar programs in 22 states. These utility programs range significantly in design and size."). For an argument supporting the above community solar programs, see JOHN FARRELL, COMMUNITY SOLAR POWER: OBSTACLES AND OPPORTUNITIES (2010), https://ilsr.org/wp-content/uploads/files/communitysolarpower2.pdf.

154. Minnesota's community solar program (in the jurisdiction of investor-owned utility Xcel Energy) has been analyzed by the Institute for Local Self-Reliance (ILSR) which found that

> Minnesota's community solar program grew to 848 megawatts of operational capacity in December 2022. . . . Data from Xcel Energy shows that bill credits for all customers totaled more than $2.2 million in February 2018, for 17.3 million kilowatt-hours. Based on the 2018 approved value of solar, the energy was worth at least $2.2 million. According to ILSR's analysis, all customers (subscribers or not) are seeing financial benefits from community solar. The $2.2 million figure does not include factoring in the distribution capacity value of solar nor the potential volatility of gas prices that are avoided, nor does it include the benefits of shifting wealth from power generation ownership away from a private monopoly and to a broad set of subscribers across the state.
>
> [. . .]
>
> While most of the program's total capacity continues to serve commercial customers (83%), much of that total capacity notably serves public entities (up from one-third or about 100 megawatts of the total program capacity in March 2018). These public entities include schools, colleges, hospitals, and county and local governments, as outlined in Xcel Energy's 2018 Annual Operations Report (April 2019). In other words, community solar helps broaden those who benefit from solar by enabling individuals and public institutions to save money with solar!

John Farrell & Maria McCoy, *Why Minnesota's Community Solar Program Is the Best*, INST. FOR LOC. SELF-RELIANCE (Dec. 22, 2022), https://ilsr.org/minnesotas-community-solar-program/.

155. BREHM & LILLIS, FINANCIAL ANALYSIS RESULTS, *supra* note 3, at 7.

Community Challenge," the authors designed the legal structure for a Solar Commons prototype to work in front of the meter with Minnesota's community solar program. This Solar Commons was intended to benefit the historically underserved neighborhoods of North Minneapolis by funding, through its trust ownership mechanism, internships for local high school students to report on neighborhood environmental issues in their local community newspaper.[156]

The authors' design work for North Minneapolis is an example of the variety of benefits, beyond electricity bill savings, that community partners can access when strong net-metering policies are available. By capturing and distributing the common wealth of solar energy through reasonable net-metering rules, Solar Commons trust ownership provides a revenue stream for creative community problem-solving.

Strong net-metering policies are indeed essential to increasing solar energy generation in the 21st century. However, it is not clear whether investor-owned utility monopolies will continue to dominate the electric grid once distributed renewable energy generation technologies present new opportunities and call for new and shared ownership policies.[157] It is important to note that, even without the strong net-metering policies, the Solar Commons model presents an opportunity for low-income communities to capture a common wealth benefit by using battery storage. Thus, in another investor-owned utility jurisdiction of Minnesota where strong net-metering policies for community solar do not exist, the authors are designing a behind-the-meter Solar Commons prototype that will use a battery to store solar energy and sell it back into the grid when demand charges create a higher price than what weak net-metering rules allow.[158] This will create a greater revenue stream for the trust and thus more funding for the Solar Commons beneficiary.

In summary, we have noted several ways that the Solar Commons Community Trust Model can circumvent current policy barriers facing U.S.

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156. *See* Farrell & McCoy, *supra* note 154. In Minneapolis, the authors worked in partnership with Greenway Solar, Pilsbury United Communities, and North News community newspaper.

157. For a discussion on challenges facing incumbent utilities from distributed renewable energy generation, see Kevin B. Jones et al., *Distributed Utility: Conflicts and Opportunities Between Incumbent Utilities, Suppliers, and Emerging New Entrants*, *in* FUTURE OF UTILITIES – UTILITIES OF THE FUTURE 399, 415 (Fereidoon P. Sioshansi ed., 2016). For a discussion of the negative impacts of strengthening monopoly ownership in the U.S. electricity sector, see John Farrell & Karlee Weinmann, INST. FOR LOC. SELF-RELIANCE, MERGERS AND MONOPOLY: HOW CONCENTRATION CHANGES THE ELECTRICITY BUSINESS (2017), https://ilsr.org/electricity-mergers-and-monopoly/.

158. For a description of how PV batteries can change the economic value of a grid-connected solar array, see Kelvin Say et. al., *Power to the People: Evolutionary Market Pressures From Residential PV Battery Investments in Australia*, 134 ENERGY POL'Y 110977 (2019).

solar energy ownership in an investor-owned utility monopoly landscape in order to provide a common good benefit to low-income communities.[159] It is important to note that public utility companies provide an essential service to consumers by delivering effective and efficient access to power. The public utility industry creates thousands of jobs by powering our Nation's industries and commerce; without them, we would all be left in the dark. Nevertheless, investor-owned public utilities, like other for-profit companies, must keep the interests of their shareholders paramount and provide acceptable levels of profits and returns on investment. In contrast, the Solar Commons Community Trust Model plugs community members into a mission of serving their own communities by using solar-generated energy and by creating incentives for engagement as stakeholders in the process of creating the local governance rules of the trust agreement. Current struggles over how solar energy use can be designed to benefit Americans at all income levels reveal that there is a great need for a more resilient and flexible model than current investor-owned, publicly regulated utility companies and government programs can provide. As solar and other distributed renewable energy technologies create new opportunities for greater consumer participation in the area of self-generating energy at point of use—where traditional energy "consumers" of dirty electricity coming from distant and enormous coal and gas power plants transition into "prosumers" of clean electricity produced from small solar arrays on nearby rooftops and urban brownfields—the need for innovation in solar energy ownership models will also grow. Many barriers facing low-income communities seeking access to the benefits of solar energy in current public and private property regimes can be circumvented using the Solar Commons Community Trust Model.

V. SOCIAL INNOVATIONS OF SOLAR COMMONS COMMUNITY TRUSTS

The Solar Commons trust model should be viewed as a tool for just, sustainable social innovation. New technologies often create opportunities for social innovations.[160] Users of solar energy, like adopters of earlier energy technology systems, can become social inventors as they seek new ways to

159. We have not described how solar energy programs set up by investor-owned utility companies are limited in the amount of support they can provide due to the fact that such companies are ultimately driven by their profit motives, which naturally limits the amount of support they can or will provide to low-income communities.

160. *See generally* THE SOCIAL CONSTRUCTION OF TECHNOLOGICAL SYSTEMS: NEW DIRECTIONS IN THE SOCIOLOGY AND HISTORY OF TECHNOLOGY (Wiebe E. Bijker et al. eds., 1989).

overcome barriers to equitable solar deployment.[161] As in the past, the legal reforms that come with widespread applications of the practical solutions of trust law can also enable new social forms such as new business institutions and new vehicles for social inclusion. As noted previously, the Solar Commons Community Trust Model's practical structure offers flexibility to work within and around current utility laws. It also offers advantages over contract law and other utility or government programs in delivering community benefits. As we suggest below, offering such flexibility within the dominant property regimes gives the Solar Commons Community Trust Model opportunities to foster new, practical frameworks that institutionalize and protect solar energy as a form of common property holding: a common good asset for intergenerational equity. The SCCTM's structure also offers new opportunities to expand energy democracy by including low-income communities as stakeholders in the co-governance of community solar assets through the beneficiary's role as equitable title holder and consultant in the rulemaking process of the trust agreement.

A. Equitable Ownership, Community Stakeholders, and Energy Democracy

Solar energy technology offers expanded possibilities for the design and practice of energy ownership in the 21st century. The centralized ownership institutions appropriate for industrial-scale power generation plants, and the massive networks of gas pipelines and coal trucks that carry fossil fuels to those plants, evolved over the 20th century to serve specific stakeholders in a carbon-intensive energy infrastructure system.[162] Ownership vehicles appropriate for low-carbon energy infrastructure systems that include solar energy are only beginning to take shape. In the case of solar, it is the technology itself that offers potential for social innovation. Solar energy's distributed fuel source (sunshine) and photovoltaic technology offer a variety of new scales and sites for generating sustainable, clean electricity—from small rooftop installments at point of use to larger arrays in rural settings that feed solar electricity directly into transmission grids. These new design conditions also offer new possibilities to social innovators looking to expand equity and democracy in a 21st-century clean energy system. The technological facts and social possibilities surrounding solar energy are leading social thinkers toward innovations in what is called "energy

161. THOMAS P. HUGHES, NETWORKS OF POWER: ELECTRIFICATION IN WESTERN SOCIETY, 1880–1930 (1993).

162. For a historical description of the 20th-century ownership structures that enabled the United States to become the highest (per capita) energy consuming nation in the world, see DAVID E. NYE, CONSUMING POWER: A SOCIAL HISTORY OF AMERICAN ENERGIES 5–6 (1999).

democracy": decentralized ownership models for renewable energy, broadened access to clean energy ownership, and greater participation in governance of energy resources.[163] There are several ways in which the Solar Commons Community Trust Model participates in and expands energy democracy.

First, Solar Commons apply the concept of "equitable ownership" to low-income communities who are underserved by current community solar ownership models (as noted in the introduction to this Article), thereby expanding the quantity and quality of solar energy beneficiaries. The equitable owner of the benefits of a Solar Commons trust is a community program serving the interests of low-income neighborhoods otherwise left out of traditionally administered solar energy benefits.

Second, as a bottom-up community empowerment tool, Solar Commons trust ownership is designed to include community participation in the process of trust creation. Community members can use public and civic association processes to form partnerships to initiate bringing a Solar Commons project to their neighborhood.[164] Alternatively, nonprofit associations, churches, temples, mosques, and other forms of community congregation can initiate the process of partnership building to determine what local need might be served through a Solar Commons trust. Once the Solar Commons trust partnerships—settlor, host, trustees, trust protector, and beneficiaries—are established, the process of writing the trust agreement can also include community stakeholders as participants. Community stakeholders might also be active once the solar array is built and generating an income stream for the Solar Commons trust beneficiary. Since the beneficiary is the equitable owner of the trust benefits, stakeholders involved in the governance structure of the beneficiary institution will also have a voice in monitoring the effectiveness of the trust arrangement and reporting to the Solar Commons trust protector if changes need to be made.

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163. The term "energy democracy" refers to evolving hopes and opportunities within the field of energy transformation. The following articles summarize the scope of the term: Kacper Szulecki, *Conceptualizing Energy Democracy*, 27 ENV'T POL. 21 (2018); Jennie C. Stephens, *Energy Democracy: Redistributing Power to the People Through Renewable Transformation*, 61 ENV'T: SCI. & POL'Y FOR SUSTAINABLE DEV. 4 (2019); Matthew J. Burke & Jennie C. Stephens, *Political Power and Renewable Energy Futures: A Critical Review*, 35 ENERGY RSCH. & SOC. SCI. 78 (2018).

164. The Tucson, Arizona Solar Commons, for example, is developing a "participatory budgeting" process to be used by community members to annually distribute the Solar Commons Trust funds in their underserved beneficiary neighborhood. One of the authors (Milun) is the Principle Investigator of the Solar Commons Research Project at the University of Minnesota Design Center, which works with Solar Commons beneficiary communities to co-design greater community participation and new digital dashboard peer governance tools. For more information on the peer governance research for the Tucson and Minnesota Solar Commons "living labs," see *Living Labs*, SOLAR COMMONS PROJECT, https://solarcommonsproject.org/living-labs/ (lasted visited Apr. 19, 2023).

Third, these local, practical means of expanding community participation in solar energy ownership, through the legal design of Solar Commons trust arrangements, will also be amplified by scaling Solar Commons in the United States and by applying conceptual design principles expressed in community-engaged public art. The equitable title to solar energy common wealth established in the Solar Commons community trust ownership model needs to be made visible and public in the communities who benefit from the Solar Commons trust. In the expanded notion of energy democracy enabled by solar energy, these Solar Commons community stakeholders are, in a cultural sense, "owners" of their fair share of the sun's common wealth. They are like the users of the enduring medieval peat and wood commons in English law who remain, generation after generation, equitable owners of energy resources in lands whose legal title is held in trust. In order to innovate a locally effective Solar Commons trust ownership model and scale that model to be nationally effective, the Solar Commons trust model needs to "translate" the equitable title of trust law out of its technical legal form and into its informal, communicable (and thus "equitable") cultural form. Thus, the social innovation of SCCTM ownership needs a cultural innovation that can be delivered in public art so that community education and celebration can help give meaning to the collective "community" that is at the heart of real community solar ownership. In the Tucson-based Solar Commons prototype, several public art elements were created with community members, in the low-income neighborhood of the Solar Commons beneficiary thus giving the conceptual legal practice of equitable title a public face.[165]

While the authors are currently involved in actualizing the legal and cultural design of Solar Commons trust ownership through prototypes built in Minnesota and Arizona,[166] their aim is to see Solar Commons proliferate quickly in cities and towns across the United States as part of the broader energy democracy work to innovate democratic institutions to address the twin crises of social inequality and climate change. In this larger goal, the authors are inspired by the successful scaling strategy accomplished by another innovation linked to expanding democracy through America's social infrastructures over a century ago: the Carnegie Library model. To better understand how the Solar Commons Community Trust Model views its

165. Readers are invited to visit the Solar Commons Research Project website at http://solarcommonsproject.org to view the Solar Commons neighborhood art.

166. *SC 1.0 Tucson, Arizona*, SOLAR COMMONS PROJECT, https://solarcommonsproject.org/tucson-arizona/ (last visited Apr. 19, 2023); *SC 2.0 Northern Minnesota*, SOLAR COMMONS PROJECT, https://solarcommonsproject.org/minnesota/ (last visited Apr. 19, 2023).

contribution to social innovation, it is instructive to consider the cues it takes from the Carnegie model.

At the turn of the 20th century, the Carnegie Endowment sought to support democratization of knowledge by building over 1,500 "free libraries" in cities and towns throughout the United States. The free Carnegie Libraries were a gift of U.S. Steel magnate, Andrew Carnegie, who maximized his Gilded Age wealth for the common good by outlining key principles of open-access, open-shelf library design and providing grants to communities willing to build and steward such free libraries.[167] The Carnegie Foundation worked with local organizers—often women's clubs partnering with local government officials to locate sites and other in-kind support—and within a span of decades helped institutionalize these new open-shelf access practices that further democratized how public libraries served local communities in the United States.[168] Taking its cue from the success of the Carnegie Libraries, the Solar Commons trust ownership model could use similar design principles to scale and democratize solar energy over the next decade in the United States. Below are examples of how the Solar Commons

167. *See* ABIGAIL A. VAN SLYCK, FREE TO ALL: CARNEGIE LIBRARIES & AMERICAN CULTURE 1890–1920 (1995)

168. *See id.* (noting how Carnegie libraries contributed to the broader picture of American democracy). For a discussion of how Carnegie library design principles impacted local architectural design in spatializing democracy and education, see Nan Dahlkild, *The Emergence and Challenge of the Modern Library Building: Ideal Types, Model Libraries, and Guidelines, from the Enlightenment to the Experience Economy*, 60 LIBRARY TRENDS 11, 18, 20 (2011). Dahlkild writes:

> The introduction of "open shelves" or "open access" around the turn of the last century was an important and much-discussed prerequisite for the development of modern public libraries. An important conception was the library's central role in education, enlightenment, and democracy. The ideal was that library materials should be available to all, regardless of class, race, origin, language, or education. These libraries were often founded and funded by private patrons of culture and education.
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> [. . .]
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> A special type of this library model were the Carnegie libraries. The Scottish-American steel magnate Andrew Carnegie funded no fewer than 2,509 libraries throughout the English-speaking world as an early example of globalization: 1,681 in the United States; 125 in Canada; 660 in England and Ireland; 18 in New Zealand; 4 in Australia; 12 in South Africa; 6 in the Caribbean; and 1 each in the Seychelles, Mauritius, and Fiji. These libraries, built as miniature temples of knowledge, belong to a distinctive category of their own. To begin with, Carnegie supported a plethora of charitable initiatives. In his essay "The Best Fields for Philanthropy" (published in the *North American Review* in 1889), he listed seven fields: universities, libraries, hospitals, public parks, meeting and concert halls, public baths, and churches. But the best gift that could be made to a local community, he argued, was a public library. Later he concentrated his donations to libraries.

Community Trust Model would scale in the United States following the Carnegie Library model.

First, based on the prototyping work of the Solar Commons research team that is designing and testing flexible and clear trust guidelines and open-source Solar Commons legal templates, the Solar Commons Community Trust Model could be a vehicle for large, Carnegie-like donors with missions to mitigate climate change and enhance social equity. These donors could partner with low-income community program providers to fund Solar Commons projects in rural and urban areas across the United States.[169] In addition to providing the legal vehicles for scaling, the Solar Commons Community Trust Model could also provide communities and donors with the legal "translations," the cultural designs, and neighborhood engagement processes that are a significant part of how Solar Commons will become an effective "commons option" in the solar energy sector. Just as the Carnegie libraries expanded 20th-century ideals of American democracy by offering local readers the practical experience of exploring knowledge in open-access bookshelves, the Solar Commons Community Trust Model would expand 20th-century democracy concepts by providing a creative, public art-making process for local, low-income neighborhoods. Such experience would likewise help communities become conscious of the broader democratic principles behind equitable ownership of renewable energy assets and, by extension, increase awareness of the value of sustainable stewardship of common property Earth resources. The Solar Commons Community Trust Model would realize these democracy-expanding ideals by outlining processes whereby neighborhoods benefiting from programs supported through the Solar Commons trust funds can see themselves and participate as stakeholders in equitable ownership. Just as Carnegie library architects were given general and flexible design principles to incorporate democratic ideals of knowledge-sharing—open-shelf access and loft structures to designate the "higher" ideals of enlightenment knowledge—into the library building structure, communities developing a Solar Commons community trust would have design principles to co-create public art that defines the neighborhood as a Solar Commons beneficiary and celebrates their stakeholder status in the equitable title to the sun's common wealth.[170] Solar

169. The business plans to scale the Solar Commons Community Trust Model in the United States are being developed by the Solar Commons nonprofit, a 501(c)(3) charitable organization. For further information, see *Who We Are*, SOLAR COMMONS, https://www.solarcommons.org (last visited Apr. 19, 2023).

170. To create the public art, Solar Commons Research Team members worked in the Solar Commons beneficiary neighborhood of the first Solar Commons prototype in Tucson, Arizona. *See SC 1.0 Tucson, Arizona*, SOLAR COMMONS PROJECT, https://solarcommonsproject.org/tucson-arizona/ (last

Commons design principles would include creating a "public face" for Solar Commons ownership through both public art (as noted above) and through digital app tools that make public and transparent the kilowatt-hours produced by a local Solar Commons array and the benefits it funds for its low-income community stakeholders.[171] Based on ancient legal precedent, we know that community stakeholders benefiting from feudal energy commons of peat and wood celebrated their equitable interests in the Earth's energy gifts in yearly festivals, local saints' days, and local village fairs.[172] Modern legal forms of community ownership can also be more powerfully and meaningfully iterated and scaled using both technical documents and joyful celebrations.

Carnegie libraries have lasted in various forms for three generations. Solar Commons trusts will last as long as is stipulated in the trust agreement, generally a period given by the solar technology itself, approximately 25 to 30 years. But once the practice of "Solar Commoning"[173] is recognized in

visited Apr. 23, 2023). Researchers collaborated with students at the University of Arizona School of Art and children in afterschool programs of the Solar Commons beneficiary neighborhood, the Garden District, to create a board game that teaches "design principles" of Earth commons (water, air, plants, animals, minerals, and sun) in connection with design principles of Solar Commons (agreement, gathering, technologies, electricity, trusts, neighborhood). The children become the "messengers" of Solar Commons in their neighborhood by playing the board game in local festivals and with family members. The children playing the board game are also the subject of a neighborhood mural and utility box paintings throughout the neighborhood.

171. The digital face of the Solar Commons includes an app tool whereby hosts and trustees input the kilowatt-hours produced by the Solar Commons array, the savings on their electric bill, the cost subtractions made to maintain the array, and the final amount of money owed by the trust and sent to the beneficiary. This information is registered and maintained in a database accessible by all parties to the Solar Commons trust including the trust protector. By creating transparency in the electronic and monetary processes, the digital tools help maintain *trust* in the Solar Commons ownership system. Again, all of these technical and conceptual design elements are part of the work of the Solar Commons Research Project, a team of community-engaged, multi-disciplinary researchers who view community trust ownership of solar energy assets to include technical, legal, and cultural norm-shaping forms.

172. Much as medieval commoners had festivals and other cultural forms that reinforced the shared public memory of their equitable title to turbary or forest commons, Solar Commoners should also have cultural forms that iterate their solar access rights and stewardship duties to sustainably manage shared assets for the good of the community.

173. Activists and scholars associated with the "commons movement" use the noun "commons" as a verb for reasons best articulated by two prominent commons scholars, David Bollier and Peter Linebaugh. *See* David Bollier, *The Commons as a Different Engine of Innovation*, DAVID BOLLIER: NEWS AND PERSPECTIVES ON THE COMMONS (Sept. 12, 2011), https://www.bollier.org/commons-different-engine-innovation-0. Bollier writes:

> Our basic challenge is to rediscover "commoning"—the commons as a verb, the commons as a set of social practices. "The allure of commoning," historian Peter Linebaugh has written, "arises from the mutualism of shared resources. Everything is used, nothing is wasted. Reciprocity, sense of self, willingness to argue, long memory, collective celebration and mutual aid are traits of the commoner."

Id.

local communities and the role of Solar Commons trust protectors is institutionalized in all states, Solar Commons can continue to iterate and scale throughout the 21st century in legal and cultural forms that articulate its democratic, regenerative vision of energy commons in sync with Earth commons. Despite its very different material form from the brick and mortar of a Carnegie library, the "public face" that community stakeholders and funders co-create for Solar Commons will nevertheless offer an opportunity for general, democratic principles informing the common good to be adapted to local, contemporary realities. Carnegie libraries are all different; local architects designed them to look like the places where they were built.[174] Solar Commons trusts will likewise adapt principles of local, equitable energy ownership to meet the diverse needs of 21st-century life that arise differently for diverse communities. The diversity of Solar Commons adaptations should also be visible in the community's Solar Commons public art.

How the legal idea of equitable title evolves to address community needs for social and ecological equity in 21st-century America will require a wide-ranging legal imagination. The Solar Commons Research Project aims to deliver the tools to experiment with trust law so that trust ownership can expand energy democracy with solar technology just as it expanded energy equity 400 years ago with peat and wood commons. Initially, Solar Commons projects will stand as neighborhood models; perhaps, in the future, a significant segment of our national renewable energy powered electric grid could be allocated to serving local underserved communities through a "commons option" delivered by Solar Commons trust ownership.[175]

B. Institution-Building for Commons: The Solar Commons Trust Protector and Intergenerational Equity

The Solar Commons Community Trust Model embraces the notion that each generation has a responsibility to maintain the resources of our Earth so that they remain available for each generation to come. Solar energy is among

174. For a discussion of the progressive values integrated into the design of the early Carnegie public libraries, see Alistair Black & Oriel Prizeman, *The Design of the Carnegie Library in Danville, Illinois (1904): Rereading the Reputation of the Carnegie Library Built-Form in America*, 5 LIBRS. CULTURE & SOC'Y 24 (2021).

175. A 2018 study of the scalability potential of the Solar Commons model by the Rocky Mountain Institute found that a minimum of ten gigawatts could be installed in the U.S. There are currently 60 gigawatts of installed solar in the U.S. BREHM & LILLIS, SCALABILITY AND CONSTRAINTS ANALYSIS, *supra* note 3, at 6.

one of these valued resources.[176] The equitable considerations that support the principles of utilizing a trust-based model for solar energy support the notion that later generations should not be worse off than previous generations.[177] Solar Commons has advanced the notion that each and every generation serves as both a trustee for the planet, with obligations to care for its resources, and as a beneficiary, with rights to use and enjoy its resources. To institutionalize these principles in the solar energy sector, the Solar Commons Research Team is defining and testing the roles and responsibilities of a Solar Commons trust protector.

The role of "trust protector" is given in trust law as a flexible device to encourage transparency and accountability between the trustee and beneficiary in a trust relationship.[178] Trust protector roles are continuing to evolve to meet the needs of community land trusts and conservation land trusts.[179] In the Solar Commons Community Trust Model, the role of trust protector will evolve to meet the needs of the solar array hosts, trustees, and community beneficiaries. Its key role will be to protect the trust asset for the good of the community beneficiary. But how it carries out that role, how it sets up its relationships with the trust beneficiaries and trustees, how it creates rules to change the rules of the trust agreement when necessary—all of these functions of the trust protector are part of the social innovation called for by the adaptation of trust ownership to community solar. Researchers involved with the Solar Commons Research Project have created a charitable purpose organization, the Solar Commons nonprofit, to innovate and institutionalize the role of the trust protector for Solar Commons ownership in the United States.[180] As solar energy is increasingly and successfully owned by Solar Commons trusts as a form of common wealth, the work of a Solar Commons trust protector will become clearer and could be shared and even standardized to bring stability to the institutionalization of Solar Commons trust ownership.

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176. *See* Dinah L. Shelton, *Intergenerational Equity*, *in* SOLIDARITY: A STRUCTURAL PRINCIPLE OF INTERNATIONAL LAW 123, 131 (Rüdiger Wolfrum & Chie Kojima eds., 2010); Edith Brown Weiss, *Climate Change, Intergenerational Equity and International Law: An Introductory Note*, 15 CLIMATIC CHANGE 327, 330 (1989) ("Each generation is both a trustee and a beneficiary, or a custodian and user, of the planet."); *see also* Edith Brown Weiss, *Intergenerational Equity: A Legal Framework for Global Environmental Change*, *in* ENVIRONMENTAL CHANGE AND INTERNATIONAL LAW 385, 397 (1992); Donna R. Christie, *Marine Reserves, The Public Trust Doctrine and Intergenerational Equity*, 19 FLA. STATE UNIV. J. LAND USE & ENV'T L. 427, 434 (2004).

177. Edith Brown Weiss, *Our Rights and Obligations to Future Generations for the Environment*, 84 AM. J. INT'L L. 198, 200 (1990).

178. *See* Ausness, *supra* note 121, at 327.

179. *Id.* at 324.

180. *See Who We Are*, *supra* note .

The social shape of common wealth trusts and the social rules needed to protect them are an area of growing concern to legal thinkers and environmental activists alike. The social innovations offered by the research behind the Solar Commons trust protector will contribute to this ongoing field of legal and institutional design for trust law. As noted previously, invoking the public trust doctrine to protect the Earth's atmosphere is also an emergent legal strategy. State by state, a public trust litigation strategy is underway in the United States to protect the air's carbon-carrying capacity for the next generation of Earthlings to thrive as their forebears have for the past 10,000 years of the relatively stable climate regime of the Holocene.[181] Many scientists, economists, and politicians are calling for the creation of common wealth trusts to protect, govern, and steward air, water, and other resources diminished and under ever more serious threat given ineffective state laws and harmful market sector practices.[182] As noted by Peter Barnes, commons activist and scholar:

> Designing and creating common wealth trusts, when and where possible, will involve research, discussion, and experimentation. What assets should be held by common wealth trusts? How should the trusts be governed? How should their valves—that is, the mechanisms that reduce overuse of nature—operate, and how should revenue be collected? There are no perfect answers to these questions, but there are many good ones worth testing.[183]

Barnes goes on to note,

> A transition to an economy in harmony with nature and human needs will take a great deal of time and effort. During this multi-decade endeavor, I would not place too much faith in public policies that can fluctuate with the vagaries of politics. However, I *would* place it in solidly built common wealth trusts, supported by a society of co-owners and bound as much as humanly possible to generations to come.[184]

It is important to understand the social innovations proposed and being tested by researchers designing Solar Commons community trust ownership

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181. Wood, *supra* note 86, at 596.

182. *See e.g.*, Peter Barnes, *Common Wealth Trusts: Structures of Transition*, GREAT TRANSITION INITIATIVE (Aug. 2015), https://greattransition.org/publication/common-wealth-trusts; *see also, e.g.*, BARNES, *supra* note 78, at 66–67.

183. Barnes, *supra* note .

184. *Id.*

in the larger category of the "structures of transition" which many social activists and thinkers have undertaken in recent decades.[185] A key concern and design feature of all these structures is intergenerational equity: How can we protect the conditions and resources of life on Earth for future generations? Given its deep historical roots in protecting intergenerational equity, trust law is inherently structured to assist in creating the social structures to transition from a fossil fuel to a renewable energy economy. The Solar Commons Community Trust Model is part of this larger social work.

CONCLUSION

The brief history that opened our introduction to the Solar Commons Community Trust Model demonstrated how trust ownership has evolved as a tool of legal reform. Since its beginnings as an equitable solution for women, soldiers, and landless peasants living within feudal property regimes, the trust instrument has been used as a vehicle to gain control of both private property and commons assets, despite the constraints of the laws of its time. The Solar Commons model shows that trust law remains a logical place to look for equitable solutions to 21st-century problems of U.S. energy distribution and ownership. The electric utility industry, arguably one of the largest industries in the U.S. economy, has successfully avoided antitrust liability despite its key business model being a publicly regulated monopoly.[186] Over the past decades, the electric utility industry has been slowly undergoing deregulation.[187] As the prices of solar and other renewable energy-sourced

185. *See, e.g.*, Jochen Markard et. al., *Sustainability Transitions: An Emerging Field of Research and Its Prospects*, 41 RSCH. POL'Y 955 (2012).

186. The purpose of antitrust law is to promote competition and prevent undesirable monopoly power. Congress designed antitrust laws to protect free competition and to prevent the excessive exercise of private monopoly power. Section 2 of the Sherman Antitrust Act provides that:

> Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony[.]

15 U.S.C. § 2 (2012). The U.S. electricity industry avoids monopoly liability by claiming to be a natural monopoly (and submitting to the public). Natural monopolies exist, by definition, where economic factors determine that competition cannot regulate the market because, inevitably, only one supplier for the market can survive. In such cases, it is argued, a sole supplier should not face antitrust liability for achieving the position of a monopolist. For a defense of the natural monopoly position, see Neil W. Hamilton & Anne M. Caulfield, *The Defense of Natural Monopoly in Sherman Act Monopolization Cases*, 33 DEPAUL L. REV. 465, 466, 468 (1983).

187. For a critique of the natural monopoly status, see Jeffery D. Schwartz, *The Use of the Antitrust State Action Doctrine in the Deregulated Electric Utility Industry*, 48 AM. U. L. REV. 1449, 1450, 1456, 1479 (1998); *see also* Ronald L. Lehr, *New Utility Business Models: Utility and Regulatory*

electricity come down thanks to new technological advances, the natural monopoly status of the electricity sector is being challenged.[188] Despite increased deregulation and new technology-enabled opportunities, the monopoly privileges of electric utilities continue to create obstacles to local community ownership of solar, with the greatest impacts on low-income communities.[189] In the past, trust law proved a useful tool to equitably hold property in ways that were at odds with the dominant property regime; today, the Solar Commons Community Trust Model provides relief from utility monopoly overreach that may be more reminiscent of a feudal landlord than a modern, competitive business. Solar Commons trusts offer an important set of conceptual and practical tools to de-lever the influence of current utility monopoly companies on the potential community value of solar power. While there is some irony in Solar Commons using trust law against carbon-intensive, path-dependent utility monopolies given the historical power of trusts to enable some of America's largest monopoly organizations (e.g., U.S. Steel and Standard Oil) to grow in the 19th and 20th centuries, we must remember that trust law also reprised its role as a protector of local and low-income community interests in land in the late 20th century as a tool for nature conservancy trusts and community land trusts. The current U.S. public trust litigation strategies that hold states accountable for stewarding the carbon-carrying capacity of the air as common property are another example of the evolving legacy of U.S. trust law for the 21st century.

This Article has also laid out the practical dimensions of Solar Commons trusts. In order to empower communities and reinforce the principle that solar energy should be available for everyone, we have demonstrated how the Solar Commons Community Trust Model offers all of the benefits of a traditional trust, such as flexibility, sustainability, versatility, resiliency, and scalability, while serving a charitable purpose. The application of a trust-based model in the solar arena allows for the philanthropic aspirations of local donors and financiers to support self-governing civic efforts to alleviate the needs of the impoverished and repair historical injustices persisting in their local communities. At the same time, those philanthropic dollars would mitigate the globally harmful effects of climate change whose impacts fall hardest on those living in poverty, wherever they live on our shared planet.[190]

Models for the Modern Era, 26 ELEC. J. 35, 38 (2013) (recommending "new regulatory models that can enable new utility business models").

188. For an analysis of the social and legal factors behind the electric utility industry's success at avoiding anti-trust liability, see Stein, *supra* note 75, at 569.

189. *See* MUELLER & RONEN, *supra* note 2, at 2.

190. Robert Mendelsohn et al., *The Distributional Impact of Climate Change on Rich and Poor Countries*, 11 ENV'T & DEV. ECON. 159, 174 (2006).

Solar Commons trusts can also avoid specific barriers that private, investor-owned utilities and government-sponsored energy programs present to low-income community energy ownership. In short, this Article has laid out the Solar Commons Community Trust Model as a common property device, a "commons option," deployable among the public and private property regimes that dominate the solar energy sector today. The Solar Commons Community Trust Model should be viewed as part of the creative legal thinking that is reinvigorating public purpose ownership in areas where 20th century market and state governance has failed to sufficiently protect the equitable interests of local communities in their economic and ecological well-being. Applying the resilient and time-tested ownership ideas of trusts, the Solar Commons Community Trust Model sheds new light on this most ancient property form and takes us back to first principles in the preservation of our planet's most precious sources of life.[191]

191. Michael McGinnis & Elinor Ostrom, *Design Principles for Local and Global Commons*, *in* 2 THE INTERNATIONAL POLITICAL ECONOMY AND INTERNATIONAL INSTITUTIONS 464, 467 (Oran R. Young ed., 1996).