

SCALING ENERGY RESILIENCE THROUGH ENERGY COMMONS AND THE SOLAR COMMONS COMMUNITY TRUST

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Synopsis: Energy Communities in both the European Union and the United States are groups of citizen and commercial actors implementing renewable energy resources on a smaller scale than traditional utility companies. Their motivations are multiple and complex: climate consciousness; cost-effective energy access; participatory democracy in the governance of the energy sector; and rent-seeking as energy participants. While these motivations may animate participation, the laws that enable the creation of these energy communities may strike unique actors differently depending on their role in creating, governing, or utilizing energy coming from the energy communities; or as actors in the energy sector working alongside or in competition with the energy community. These motivations may also reflect the State's own resilience needs for reliable energy and the pragmatic concerns about costs of transitioning to renewable energy resources. What these challenges reflect are the resilience seeking needs of both individuals and the State as they navigate pressures to adopt renewable resources for climate, economic, and developmental reasons.

The topic covered by this article was discussed as a part of the Energy Communities Symposium held at the University of Turin, Italy, in March 2024. That symposium featured several critical papers delivered around the theme of how energy commons relate to local contexts and regulatory frameworks that dictate how communities are formed, where they are located, and what obligations they are bound to undertake as an Energy Communities. As a part of this special edition of the *Energy Law Journal*, Stella Monegato, Peter Bloom, Björn Hoops and Elsabé van der Sijde, Francesca Dealessi and Andrea Laciani, and I examine the contours of the energy renewable transition faced by small-scale actors, including the landscape of energy transmission in the United States; the intersection of local actor competencies and the complexities of the EU regulation (Francessca Dealessi & Andrea Lanciani); the challenges of public governance (Stella Monegato); the economic and legal barriers facing smaller-scale renewable energy projects (Björn Hoops & Elsabé van der Sijde); the role of regulation in shaping energy governance structures and their intersection with state resilience claims (Peter Bloom); and, this piece, how the Solar Commons Community Trust can be understood through the lens of Resilient Property Theory.

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I. INTRODUCTION

Energy poverty is a pressing development concern due to the positive correlation that energy resources have with economic development. Energy Poverty occurs when the level of energy consumption is insufficient to meet basic human needs.[1] Reddy defines energy poverty as "the absence of sufficient choice in accessing adequate, affordable, reliable, high-quality, safe and environmentally benign energy services to support economic and human development."[2] This definition incorporates the importance of autonomy as a pillar of suitability. Limited access to suitable energy sources renders access to other democratic promoting institutions more tenuous, including education, healthcare, or information for participation.[3] Reddy also references availability as a key construct.

National energy consumption correlates to that nation's economic growth as measured by the human development index (HDI) and life expectancy.[4] Researchers have found correlations between greater energy development by a nation with better health outcomes as measured by life expectancy, higher levels of education, and higher standards of living.[5] For example, in a 2007 study, nations that consumed 4000 KW per capita correlated to a .9 HDI score or nearly perfect; while

1. Mikel González-Eguino, *Energy Poverty: An Overview*, 47 RENEWABLE SUSTAINABLE ENERGY REV. 377, 379 (2015).

2. Amulya K.N. Reddy, *Energy and Social Issues*, *in* WORLD ENERGY ASSESSMENT: ENERGY AND THE CHALLENGE OF SUSTAINABILITY 38, 44 (J. Goldemberg ed., 2000).

3. *See generally* BJÖRN SÖREN GIGLER, DEVELOPMENT AS FREEDOM IN A DIGITAL AGE: EXPERIENCES FROM THE RURAL POOR IN BOLIVIA (2015).

4. Rajabrata Banerjee et al., *Energy Poverty, Health and Education Outcomes: Evidence from the Developing World*, ENERGY ECON., June 9, 2021, at 19; *see generally* Fatih Birol, *Energy Economics: A Place for Energy Poverty in the Agenda?*, 28 ENERGY J. 1 (2007); D L Linton, *The Geography of Energy*, 50 GEOGRAPHY 197 (2024); González-Eguino, *supra* note 1.

5. *Human Development Index (HDI)*, U.N. DEV. PROGRAMME: HUMAN DEV. REPS., https://hdr.undp.org/data-center/human-development-index#/indicies/HDI (last visited Feb. 10, 2025) (Human Development Index is a scoring system developed by the United Nations to measure how different nation-states fare in key dimensions of human life. The scoring is a value between 0-1, with 1 being the perfect score. The scores factor three other indexes that measure the health levels of a nation as determined by the life expectancy index, the knowledge levels of a nation as measured by the education index, and the standard of living as measured by the GNI index.); *see* AMIE GAYE, HUMAN DEVELOPMENT REPORT 2007/2008, ACCESS TO ENERGY AND HUMAN DEVELOPMENT 6-8 (2007), https://hdr.undp.org/system/files/documents/gayeamie.pdf.

nineteen countries with an HDI below .6 had an annual per capital electricity consumption below 1000 KW.[6] As countries enhance their energy access, three correlated measurements also are observable: economic development increases;[7] energy consumption also increases;[8] and human development increases in some locations, while it may actually be stymied or decreased in others.[9] Some countries have associated the growth of energy consumption with increased carbon emissions in the energy sector, leading to greater focus on renewable energy deployment.[10] Several countries then face a contradiction: a need to meet consumption demands without the infrastructure in place to provide energy from renewable sources. This drive for immediate energy production exacerbates climate change when the only "fast" sources are fossil fuels.[11]

While States navigate this seemingly Kafkaesque problem, small-scale actors (including individuals and businesses), communities, and collectives promote clean energy production and consumption through energy communities.[12] One example, the Solar Commons Community Trust (SCCT), seeks to foster cleaner energy entry through energy communities normally excluded from renewable access and participation.[13] In addition to promoting cleaner access to energy, the SCCT potentially provides energy savings to adopting communities and the reinvestment of gains made by providing energy through the electrical grid to participants. This essay analyzes the SCCT through the lens of Resilient Property Theory (RPT), demonstrating its role in closing resilience gaps in the delivery of clean energy. By looking at the SCCT through the lens of RPT, this article identifies how, in the mainstream, different energy resilience assets are scaled up or scaled back by law.

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6. Kathryn Milun et al., *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*, 47 VT. L. REV. 383 (2023).

7. *See generally* Scott C. Russell et al., *What Can Tribes Do? Strategies and Institutions in American Indian Economic Development*, 18 AM. INDIAN Q. 250 (1994); Kenneth B. Medlock & Ronald Soligo, *Economic Development and End-Use Energy Demand*, 22 ENERGY J. 77, 79 (2001).

8. Selçuk Bilgen, *Structure and Environmental Impact of Global Energy Consumption*, 38 RENEWABLE SUSTAINABLE ENERGY REV. 890, 891 (2014).

9. *Id.*

10. Ortzi Akizu-Gardoki et al., *Decoupling between Human Development and Energy Consumption within Footprint Accounts*, 202 J. CLEANER PROD. 1145, 1147 (2018).

11. Michaël Aklin, *The Off-Grid Catch-22: Effective Institutions as a Prerequisite for the Global Deployment of Distributed Renewable Power*, ENERGY RES. SOC. SCI., Feb. 10, 2021, at 1 (discussing how infrastructure can be defined broadly and is context specific).

12. Energy communities have both techno-legal and descriptive qualities. For example, the EU defines energy communities in a different way than the U.S. does in the Inflation Reduction Act. *See,* e.g., Björn Hoops, *Two Tales of the Energy Commons Through the Lens of Complexity*, GLOB. JURIST, Apr. 22, 2024; Irati Otamendi-Irizar et al., *How Can Local Energy Communities Promote Sustainable Development in European Cities?*, ENERGY RES. SOC. SCI., Nov. 11, 2022, at 1; Jason G. Eisdorfer et al., *Federal Support Opportunities to Remediate and Redevelop Energy Assets*, PAC. NW. NAT'L LIBR. (Apr. 2023), https://www.energy.gov/sites/default/files/2023-05/FSOTRREA%20Report.pdf; *see infra* text on Scaling Hierarchical Resilience associated with notes 71-83.

13. *See* SOLAR COMMONS PROJECT, https://solarcommonsproject.org/ (last visited Feb. 25, 2025).

RPT[14] is a methods assemblage approach for understanding complex problems involving land and resources.[15] At its core, RPT seeks to reduce the tendency to approach problems through reductive frames that omit certain aspects of problems. A key focus of RPT has been on the role of private property in the face of collective challenges, such as housing, consumer problems, or environmental concerns. We observed, in *Squatting and the State*, a growth in ideological framing of problems as creating binary values around private property interests that, taken to the extreme, results in a veto power of owners over collective action that requires their participation. Energy development interacts with private property on several levels. The land where energy infrastructure is located is owned by someone, whether that is a utility company or an individual, implicating land use schemes such as zoning or planning requirements, or restrictive covenants which can limit where and how renewables may be deployed.[16] Tax-credit schemes differentiate between "owners" of infrastructure and utilizers (lessees or others) that dictate who has access to state-backed credit financing arrangements.[17] And energy consumption (particularly its efficiency) is often related to how land is developed, from urban density requirements embodied in preferences for single-family housing units or multi-family housing; business development and the need for reliable, accessible energy supplies; and public services on that land.[18] Energy development intersects with multiple stakeholders and the different roles they play all at once — landowner, consumer, developer, service provider, and community.

In the rights framework, property sits as a rivalrous entitlement which requires courts to evaluate the comparative strength of competing rights.[19] In the U.S., state limits on property's use often trigger the takings analysis in evaluating the effectiveness of those rights. Where purely private actors are involved, the state often defers to the rules around ownership as a coordination approach to how those interests should be balanced. Either way, when land is involved, the tendency to frame the action as either a challenge between public and private rights

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14. *See generally* LORNA FOX O'MAHONY & MARC L. ROARK, SQUATTING AND THE STATE: RESILIENT PROPERTY IN AN AGE OF CRISIS (2022) (offering a multi-modal approach to dealing with challenging resource problems).

15. A methods assemblage approach is a multi-modal way of approaching problems, drawing on different methods to better understand the problem. Drawing on methods that emphasize triangulation, the approach is built off the view that methods contain inherent biases formed from the development of the method. By approaching problems through multiple methods, the problem can be better understood apart from inherent biases that might limit how the problem is approached. *See* JOHN LAW, AFTER METHOD: MESS IN SOCIAL SCIENCE RESEARCH (John Urry ed., 2004).

16. *See generally* Kristina Caffrey, *The House of the Rising Sun: Homeowners' Associations, Restrictive Covenants, Solar Panels, and the Contract Clause*, 50 NAT. RES. J. 721 (2010); Jenny Palm, *Household Installation of Solar Panels – Motives and Barriers in a 10-Year Perspective*, 113 ENERGY POL'Y 1 (2018); John Wiley, *Solar Energy and Restrictive Covenants: The Conflict Between Public Policy and Private Zoning Comment*, 67 CALIF. L. REV. 350 (1979).

17. Felix Mormann, *Beyond Tax Credits: Smarter Tax Policy for a Cleaner, More Democratic Energy Future*, 31 YALE J. REGUL. 303, 340 (2014); Mara Hammerle et al., *Solar for Renters: Investigating Investor Perspectives of Barriers and Policies*, ENERGY POL'Y, Jan. 14, 2023, at 4.

18. *See generally* Elena Safirova et al., *Spatial Development and Energy Consumption* (Res. for the Future, Discussion Paper No. 07-51, 2007), https://ssrn.com/abstract=1087042.

19. *See generally* Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972).

or as coordinated through the owner's entitlement is apparent. Thus, as we observe in *Squatting and the State*, though problems may be multi-faceted and hybrid in nature, the fact that property is implicated often means that courts limit their analysis through property approaches. While this may be beneficial for owners, individuals outside the ownership paradigm may be limited in how publicly beneficial objectives are carried out.

Consider the following problem as an illustration for how these framing limits can impact renewable deployment. Imagine a rural area with little access to reliable electrical service. The transmission lines that connect homes in the area are owned by the local public service corporation that delivers electricity to users in the region. Those lines are older and do not use photovoltaic lines necessary to put solar power back into the grid. Moreover, the costs associated with upgrading those lines are significant. The utility provider may not want to bear the costs of upgrading even a small portion of those lines for several reasons. First, the increased use of solar by users may disrupt their own rent-seeking actions as a utility provider. Second, the upfront costs of transitioning the transmission lines, without some form of public assistance, may deter the utility from making that investment. In this scenario, the ownership of transmission lines by the utility serves as a limit on how the collective interest in transitioning to renewables can be deployed.

Those challenges reveal more asymmetries between how users in that region may respond to this problem. Some owners may decide to install solar panels anyway as both a reduction of their own unclean consumption and as a cost-savings strategy towards their energy needs. But some users may be blocked from doing the same. Renters may find landlords unwilling to allow the installation of solar panels on rooftops. Neighborhoods may block the installation of solar through restrictive covenants. These asymmetries reveal resilience gaps that exist between property owners and non-property owners by limiting the analysis of problems to frames dictated by the existence of private property claims on resources.

To avoid the limits that property can confer on problem solvers, we make four distinct moves in RPT as we endeavor to think about what resilience claims mean in the context of property systems that create insiders and outsiders.

- **Wicked Problems Methods.**[20] Wicked problems are "a large-scale, social, economic, and political problem, embedded in complex causal webs of interlinking variables."[21] Easily subject to framing limits, "[p]rogress towards agreed solutions is stymied by the absence of a shared interpretation or collective understanding of

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20. For a brief survey of writings relating to wicked problem theory, *see generally* Aleksander Jakimowicz, *The Energy Transition as a Super Wicked Problem: The Energy Sector in the Era of Prosumer Capitalism*, ENERGIES, Dec. 1, 2022; Anna Volkmar, Muddling through Wicked Complexity: Why We Should Look at Art When We Talk about Nuclear Power (Jan. 26, 2021) (Ph.D. dissertation, Leiden Univ.), https://hdl.handle.net/1887/3134622; Gerald M Allen & Ernest M Gould, *Complexity, Wickedness, and Public Forests*, 84 J. FORESTRY 20 (1986); JEFF CONKLIN, *WICKED PROBLEMS AND SOCIAL COMPLEXITY* (2006); Svein Jentoft & Ratana Chuenpagdee, *Fisheries and Coastal Governance as a Wicked Problem*, 33 MARINE POL'Y 553 (2009); Kelly Levin et al., *Overcoming the Tragedy of Super Wicked Problems: Constraining Our Future Selves to Ameliorate Global Climate Change*, 45 POL'Y SCI. 123 (2012).

21. FOX O'MAHONY & ROARK, *supra* note 14, at 3.

the problem."[22] Because the problem space is subject to different starting points or framing limits, "attributions of responsibility are disputed[] and definitive solutions are elusive."[23] RPT sets out to define property's role in problem solving — not as a constraining limit on the range of possibilities (defined by either the identity of the actor or the character of the problem, but rather a holistic approach that values the role of the institution of private property and its resilience affording role in context with other forms of resilience).

- **Vulnerability Theory.** RPT invokes Vulnerability Theory for understanding how individuals, groups, states, and institutions (like private property) interact with one another.[24] Starting from the universal reality that all humans experience the same inherent vulnerabilities, the Vulnerability Theory (as well as RPT) articulates that what creates distinctions is the embeddedness of humans and communities in institutions.[25] Embodiedness is a universal term and refers to the basic needs that all humans require — such as shelter, water, food, clean air, and society.[26] Those needs are mediated by the embeddedness of individuals in institutions that provide resilience, including the family, property, communities of faith, and more. Unlike embodiedness, embeddedness is a scaled concept reflecting that different actors may experience access to institutions differently. Resilience in this setting can mean access to financial resources, community belonging, or even rights recognized by state actors (like private property). We argue in *Squatting and the State* that the state itself is a vulnerable human institution, and as such, it seeks out its own resilience while simultaneously doling out resilience to others.[27] RPT seeks to take seriously the interests of all stakeholders in problem solving, and in particular accounting for what kinds of resilience stakeholders have access to and what kinds of resilience gaps emerge between stakeholders.

22. *Id.*

23. *Id.*

24. Institutions emerge from a series of rules or ordering principles that serve the interests of different actors (including the state) enhancing the formation of stable systems of hierarchically situated groups. *See* ANTHONY GIDDENS, THE CONSTITUTION OF SOCIETY: OUTLINE OF THE THEORY OF STRUCTURATION 17 (1984); *Id.* (According to Giddens, institutions emerge in relation to structural commitments of society: "the most deeply embedded structural properties, implicated in the reproduction of societal totalities, [Giddens] calls structural principles. Those practices that have the greatest time-space extension within such totalities can be referred to as institutions."). Other scholars describe the effect of institutions and their relation to power and domination. *See generally* ULRICH BECK, POWER IN THE GLOBAL AGE (2005); LINDA WEISS, THE MYTH OF THE POWERLESS STATE (1998).

25. Martha Albertson Fineman, *The Vulnerable Subject and the Responsive State*, 60 EMORY L.J. 251, 255-56; *see* Martha Albertson Fineman, *Equality and Difference – The Restrained State*, 66 ALA. L. REV. 609, 626 (2015); *see also* Martha Albertson Fineman, *Vulnerability and Inevitable Inequality*, 1 OSLO L. REV. 133, 134 (2017).

26. *The Vulnerable Subject and the Responsive State*, *supra* note 25, at 268-69.

27. FOX O'MAHONY & ROARK, *supra* note 14.

- **Scaling Resilience.** The dimensions of resilience between differently situated actors are particularly important. Different actors have access to different forms of resilience that mitigate their vulnerabilities. Resilience itself, particularly as found around resource problems like energy, is scaled across three registers: rhetorical, material, and hierarchical. Material resilience can be found in having access to a physical asset, which is scaled against other assets for its size, value, and location. Hierarchical resilience is found in the recognition of distinct rights that emerge from the State — whether those rights are scaled by the different category of possessory claims (owners versus tenants) or whether they reflect the powers of different levels of the state to regulate a problem (federal, state, or local). Finally, rhetorical resilience is the embedded stories, norms, and values that justify the institutions we support.[28] Often these registers of resilience are combined into hybrid scales. For example, when the state promotes renewable energy supplies through tax incentives, it represents hybridity of resilience across multiple registers: the rhetorical value of promoting clean energy, the hierarchical power to control revenue collection through taxes, and the material resilience of allocating funding in the form of tax credits to would-be adopters.
- **Equilibrium.** Understanding that resilience is scaled across different actors prompts the question "how should institutions respond when resilience gaps emerge amongst individuals, communities, and institutions?" The fourth move we make in RPT is asserting that resilience should be allocated in a way that promotes the equilibrium of sustainable institutions.[29] Equilibrium is an economics theory that suggests a stable point in which neither supply nor demand alter behavior. As an economic concept, equilibrium has been relegated to an aspirational hypothesis. But as a political theory, equilibrium has come to reflect the steadiness of state institutions that enable actors to make choices without fear that disruption by outside forces will render actions as moot or costly. A key point in equilibrium analysis is the avoidance of tipping points that would severely impair an institution of the state (or the state itself). As resilience is allocated (such as through the property system), we should strive to promote equilibrium by encouraging flexibility of responsiveness to problems, mechanisms that enable individuals, institutions and the state to recover from crisis, adaptability, and innovation. One key indicator that the system is creeping towards a tipping point is when actors are able to use their resilience to block the resilience of others. For example, actors with vested interests in industries that compete with renewables may challenge the efficacy of investment by the state, by advancing stories that question the

28. FOX O'MAHONY & ROARK, *supra* note 14; *see* Marc L Roark & Lorna Fox O'Mahony, *Scaling Property Law*, *in* A RESEARCH AGENDA FOR PROPERTY LAW 93 (Bram Akkermans ed., 2024).

29. Timothy Sisk, *Democracy's Resilience in a Changing World*, *in* THE GLOBAL STATE OF DEMOCRACY: EXPLORING DEMOCRACY'S RESILIENCE 34 (1st ed. 2017).

> efficacy of renewable solutions. When climate denial or questions about whether state legitimacy limit the state's adoption of solutions aimed at solving energy problems, then the rhetorical scale effectively has "jumped" the material and hierarchical deployment of collective resources towards that problem. The effect of that "jumping" is the allocation of greater resilience in the purveyor of those challenging stories, rather than those who may benefit from state investment in renewable technologies.

Applying RPT to not only how energy is accessed but who has the power to distribute energy demonstrates that resilience through energy commons can offer a pathway for solving super wicked problems such as energy transition in the age of environmental crisis.

II. ENERGY TRANSITION AS A SUPER WICKED PROBLEM

RPT starts with wicked problem theory, highlighting the problems with reductive or selective framing of problems.[30] Wicked problems arise when there are multiple stakeholders with distinctive interests that call for different frameworks of analysis.[31] The problem becomes wicked when there is no clear means for coordinating those interests, which then creates externalities on actors who are excluded from those frameworks that dominate the problem space. Taking Merrill and Smith's coordination view of property[32] as the conventional view of property's social purpose, we argue that wicked problems arise when multiple stakeholders, with different values or interests (leading to different kinds of questions) and the means for coordinating those interests, create externalities on actors who lack access to resources that are capable of adequately reducing the harm they experience.

Energy transition is a super wicked problem because it is a global response to climate change and pollution control, wherein responses require cooperation and coordination among all sorts of disciplines and fields.[33] The problem (how to transition our energy sources; how to navigate the energy transition) is made more complex due to different capabilities of stakeholders in accessing energy technologies (so-called energy poverty). Stakeholders in renewable energy share interests in the reduction of costs related to energy consumption/production and the promotion of clean energy sources for more sustainable environmental outcomes. While the stakes that face consumers are renewable energy resources, the capabilities for

30. FOX O'MAHONY & ROARK, *supra* note 14.

31. Lisa V. Bardwell, *Problem-Framing: A Perspective on Environmental Problem-Solving*, 15 ENV'T MGMT. 603 (1991).

32. The coordination view of property understands that relationships are coordinated through interests in property. Integrally, the coordination view rejects abstractions, like the bundle of sticks theory of property that disaggregates various rights in property (even as held by the same owner). *See* Robert C. Ellickson, *Two Cheers for Bundle of Sticks Metaphor, Three Cheers for Merrill and Smith,* 8 ECON J. WATCH 215, 220 (2011). Rather, Merril and Smith advocate for a view of property as a social system that systemically orders relationships based on the interest, longevity, or access that one may have. *See also* Thomas Merrill & Henry Smith, *The Property/Contract Interface*, 101 COLUM. REV. 773, 787 (2001).

33. Jakimowicz, *supra* note 20, at 6.

harnessing energy technologies differ by income,[34] geography,[35] identity,[36] and access to knowledge.[37]

Spatial inequality is the differences that exist in resources across geographies, whether on the neighborhood, local, regional, or national level.[38] Vertical inequalities between stakeholders arise when there is a non-proportional distribution of wealth and resources among social groups within a community.[39] Consumers who share similar interests and similar access to resilience tools (such as property owners) are often more visible to policymakers who orient policies with the interests and capabilities of constituents in mind. Scaling a problem according to resources often means choosing to favor some individuals over others, creating vertical inequalities.[40]

The dominant U.S. model for consumer participation in the sustainable energy economy is a prosumer model, where the individual harnesses his own economic assets to acquire the technology necessary to participate in renewable energy production and consumption.[41] As Jakimowicz writes, the energy transition to *prosumer capitalism* is a complex process, subject to many sub-problems such as legislation, energy distribution, democracy, consumer policy, and cybersecurity.[42] The ability to access those incentives can be subject to both vertical and spatial inequalities. Vertical inequalities relate to the unequal distribution of income, wealth, or other social determinants. Spatial inequalities relate to how inequalities emerge by geographic region or location.

Federal and State tax policies create vertical inequalities by subsidizing access through taxable credits and deductions — which favor those who have taxable liabilities to the state.[43] Some localities have begun harnessing local physical resources to make renewable energy sources available to lower income consumers.[44]

34. Birol, *supra* note 4, at 4; Jakimowicz, *supra* note 20, at 16; *see generally* Sulaman Muhammad et al., *European Transition toward Climate Neutrality: Is Renewable Energy Fueling Energy Poverty across Europe?*, 208 RENEWABLE ENERGY 181 (2023); Hoops, *supra* note 12.

35. *See generally* Palm, *supra* note 14; Linton, *supra* note 4; González-Eguino, *supra* note 1; Pauline M. McGuirk, *Power and Policy Networks in Urban Governance: Local Government and Property-Led Regeneration in Dublin*, 37 URBAN STUD. 651 (2000).

36. Jakimowicz, *supra* note 20, at 16.

37. Hoops, *supra* note 12, at 2; Patrycjusz Zarębski et al., *Renewable Energy Generation Gaps in Poland: The Role of Regional Innovation Systems and Knowledge Transfer*, ENERGIES, May 19, 2021, at 4.

38. Susan S. Fainstein & Norman I. Fainstein, *National Policy and Urban Development*, 26 SOC. PROBS. 125 (1978).

39. *Id.*

40. *Id.*

41. *See* Jakimowicz, *supra* note 20, at 2.

42. *Id.* at 1.

43. *See, e.g.*, Ann Carrns, *At 30%, Solar Panel Tax Credits Are at a High Point for Now*, N.Y. TIMES (Aug. 25, 2023), https://www.nytimes.com/2023/08/25/business/solar-panels-tax-credits.html.

44. Kaya Laterman, *What If Your Town Doubled as a Private Power Grid?*, N.Y. TIMES (Aug. 7, 2023), https://www.nytimes.com/2023/08/07/realestate/microgrid-solar-power-energy.html; Ivan Penn, *Los Angeles Will Offer More Energy Incentives to Low-Income Residents*, N.Y. TIMES (Nov. 16, 2023), https://www.nytimes.com/2023/11/16/business/energy-environment/los-angeles-energy-inequality.html.

Thus, while those in poverty have a "stake" in advancing renewable energy technologies, they often lack the individual threshold economic assets to participate as individuals on the same terms.[45]

Local laws, policies, and ordinances, as well as natural access to renewable resources, shape the range of energy options for communities. These geographic determinants result in spatial inequalities. For instance, persons in urban environments often have greater access to energy diversity than those living in rural settings.[46] Persons living in "wealthier countries tend to have various sources available," while those living in "poorer countries (and particularly in rural areas within those countries)" may have fewer available options or even none at all.[47] Finally, the energy sources must be adequate to the technology available to harness the energy; must be reliable; of good quality; safe and environmentally benign; and sufficient to support economic and human development.[48] Transition to renewable resources emphasizes the need to produce greater energy in developing places, while not creating greater ecological harm in the process. The state has an interest in not only reducing energy poverty through clean technologies for future generations but also to eradicate current economic, educational, and health disparities. Individuals who are "energy poor" devote more resources, labor, and time to gathering raw materials (like wood or coal) necessary to carry out energy-based functions, such as heating, cooking, and other household tasks.[49] Energy transition is a social, state, and market problem.

Socially, energy poverty disproportionately affects women and persons of color. It is also more prevalent in the global south than the global north.[50] Energy access is a necessary condition for obtaining forms of information distribution, such as radio and television. Additional research has found a correlation between educational access and energy access, in an increasingly digitized environment.[51] These findings become starker when health outcomes are measured against energy access. Studies have found that low birth rates,[52] increased risk for social and health conditions, including mental health illnesses associated with social and physical distancing,[53] and greater frequency of disease related to living in proximity to pollution caused by unclean sources of energy are among various health outcomes related to energy poverty.[54]

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45. Madeleine Ngo & Ivan Penn, *As Utility Bills Rise, Low-Income Americans Struggle for Access to Clean Energy*, N.Y. TIMES (Jan. 11, 2024), https://www.nytimes.com/2024/01/11/us/politics/utility-bills-clean-energy.html.

46. Alex O. Acheampong et al., *Promoting Energy Inclusiveness: Is Rural Energy Poverty a Political Failure?*, UTILS. POL'Y, July 21, 2023, at 1.

47. González-Eguino, *supra* note 1, at 379.

48. Reddy, *supra* note 2, at 42.

49. *Id.* at 46-47; Jun Zhao et al., *How Does Energy Poverty Eradication Promote Green Growth in China? The Role of Technological Innovation*, TECH. FORECAST. & SOC. CHANGE, Feb. 1, 2022.

50. *See, e.g.*, Reddy, *supra* note 2, at 43-44.

51. *See, e.g.*, Banerjee et al., *supra* note 4, at 1-2.

52. *See* Reddy, *supra* note 2, at 52; *see also* Banerjee et al., *supra* note 4, at 7.

53. Zhao et al., *supra* note 49.

54. González-Eguino, *supra* note 1, at 382; *see generally* Frederica Perera, *Pollution from Fossil-Fuel Combustion Is the Leading Environmental Threat to Global Pediatric Health and Equity: Solutions Exist*, 15 INT'L J. ENV'T RSCH. & PUB. HEALTH 16 (2018); Courtney J Keehan, *Lessons from Cancer Alley: How the Clean Air Act Has Failed to Protect Public Health in Southern Louisiana*, 29 COLO. ENV'T L. REV. 341 (2018).

Markets for energy access are driven by needs-based production and consumption cycles that are influenced by a growing complexity of market actors. For example, in Oklahoma, coal-based power plants historically operated at full capacity during the summer and winter seasons but cycled between minimum load and full load during other seasons.[55] During the seasons when coal-fired plants cycled below full capacity, they often lost revenue during the early morning hours when demand was low but remained at capacity to reignite as a way to make up the difference during peak hours.[56] The emergence of shale-based natural gas production and renewables forced coal-driven plants to reevaluate their economic model, raising the costs of both off-peak and peak energy times.[57] The result has been a change of practices where coal fire plants often shut down during non-peak time and return to service only when production will be expected to be profitable.[58]

Likewise, consumption itself is shaped by an ever-growing complexity between fossil fuel providers, state interests, and financial markets and marketeers. Just as financialization of land interests have resulted in an abstraction of how decisions about land are made based on "profit" motivation,[59] the financialization of utilities means that shareholder stakes shape how material choices about investment are made by power companies.[60] While individuals have a stake in the process of energy production, the processes are invisible to consumers, who only experience electricity by flipping a switch. The state's development of energy infrastructure and the adaptability of that infrastructure to renewable energy technologies shapes the market for energy access and deployment. In addition to state-supported infrastructure, state-backed financial commitments that are heavily reliant on fossil fuel production and consumption shape what kinds of access to renewable energy resources may be available to both consumers and producers of energy.[61] In Sandy Smith-Nonini's account of the Greek debt crisis, she observed a networked interplay between the energy infrastructure that was built around fossil fuels, the state's own financial debt crisis that was furthered in part from its reliance on fossil fuels, and the state's choice to recapture value in the form of heightened energy costs to its citizens in order to offset its debt liabilities.[62] The challenge, of course, is that consumption is also driven by consumer needs. As

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55. Seth Schwartz & Phillip Graeter, *Recent Changes to U.S. Coal Plant Operations and Current Compensation Practices*, NAT. ASS'N OF REGUL. UTIL. COMM'RS 19-20 (Jan. 2020), https://www.osti.gov/servlets/purl/1869928/.

56. *Id.* at 20.

57. *Id*. at 4-5.

58. *Id.* at 19.

59. M. L. Roark & L. Fox O'Mahony, *Real Property Transactions in the Network Society: Platform Real Estate, Housing Hactivism, and the Re-Scaling of Public and Private Power*, 46 J. CONSUMER POL'Y 445, 449 (2023); Lorna Fox O'Mahony & Marc L Roark, *Speculation, Squatting and Sustainability*, *in* RESEARCH HANDBOOK ON PROPERTY, LAW AND THEORY 377 (C. Bevan ed., 2023).

60. Julia M. Wittmayer et al., *Contributing to Sustainable and Just Energy Systems? The Mainstreaming of Renewable Energy Prosumerism within and across Institutional Logics*, ENERGY POL'Y, Dec. 5, 2020, at 3.

61. Sandy Smith-Nonini, *Networked Flows through a "Porous" State: A Scalar Energo-Political Account of the Greek Debt Crisis*, *in* THE TUMULTUOUS POLITICS OF SCALE: UNSETTLED STATES, MIGRANTS, MOVEMENTS IN FLUX 93 (Donald M. Nonini & Ida Susser eds., 2020).

62. *See generally id.*

Reddy notes, "what human beings want is not oil or coal, or even gasoline or electricity per se, but the services that those energy sources provide."[63]

Besides the virtue of participatory environmental stewardship, financial motives can also drive prosumer activity in renewable energy solutions. As Jakimowicz notes, "[w]hen people are driven to prosume, it is usually due to economic factors—they hope to reduce utility bills, while also making a net profit," or increase reliability.[64] Incentives that enable prosumer action can include financial offsets, such as credits that enable individuals or enterprises to finance acquisition of renewable resources through tax credit options.

While energy transition is a desirable course, not all actors are motivated by the same climate consciousness. The energy transition has produced the opportunity for rent-seeking in various forms.[65] Some marketeers have focused on the production of energy infrastructure[66] while others have marketed expertise necessary to navigate regulatory frameworks.[67] A third set of networks of different stakeholders have emerged that prey on misalignment of interest and capability amongst poor consumers,[68] such as financial firms offers to "lease" solar equipment to consumers who lack the ability to otherwise purchase. The terms of these leases are often extractive, causing the consumer to ultimately pay significantly higher sums than their purchasing counterparts. Moreover, consumers drawn into these schemes do not qualify for state and federal subsidies because they do not own the equipment. Rather, the firms that lease the equipment to consumers take the subsidies themselves, often transferring them on the secondary market to financial institutions as a form of collateral to scale-up their rent-seeking operations and transaction base.[69] These transactions can emerge in a knowledge gap, where some consumers that were educated on the importance of renewable energy production are lured into a false promise of financial benefit, finding themselves as a medium for a new form rent-seeking by firms leveraging the need for renewable transitions. The current structure of prosumer policies often leaves out impoverished populations without greater state or collective action.[70] The demand for renewable energy sources due to environmental impact, as well as the goal of reducing energy poverty has incentivized innovation but not necessarily to the benefit of the impoverished consumer.[71]

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63. Reddy, *supra* note 2, at 41. Importantly, while pollution may be an output of utility production, it would be a leap to say that they desire environmental pollution as a byproduct of their efforts. *See* Blake Hudson, *Land Development: A Super-Wicked Environmental Problem*, 51 ARIZ. ST. L.J. 1123, 1136 (2019).

64. Jakimowicz, *supra* note 20, at 7.

65. Sarah Knuth, *"Breakthroughs" for a Green Economy? Financialization and Clean Energy Transition*, 41 ENERGY RSCH. & SOC. SCI. 220, 227 (2018).

66. *Id.* at 226.

67. Hoops, *supra* note 12, at 32-33.

68. D. Feldman et al., *Financing, Overhead, and Profit: An In-Depth Discussion of Costs Associated with Third-Party Financing of Residential and Commercial Photovoltaic Systems*, NAT'L RENEWABLE ENERGY LAB'Y (Oct. 2013), https://www.osti.gov/biblio/1107462.

69. Alana Semuels, *The Rooftop Solar Industry Could Be on the Verge of Collapse*, TIME (Jan. 25, 2024), https://time.com/6565415/rooftop-solar-industry-collapse/.

70. *See, e.g.*, Penn, *supra* note 44; *see also* Laterman, *supra* note 44.

71. The gap has prompted some states and cities to step in and facilitate access to renewable energy infrastructure. *See* Danila Longo et al., *Energy Poverty and Protection of Vulnerable Consumers: Overview of the*

In response to inequalities in access (both vertical and spatial) as well as knowledge gaps in accessing solar and wind power, a renewed focus on collective efforts to harness renewable energy resources have emerged, where neighbors, small governments, Tribes, or other collectives have organized to offer alternatives to the solo-prosumer model of energy renewables. The SCCT is one such collective effort. Importantly, the SCCT brings together stakeholders with different expertise, interests, and backgrounds to launch access to renewables in communities that previously were limited to traditional delivery of electrical power. These include outside experts, community organizers, financial partners, lawyers, and importantly community members to organize and govern the resources of the SCCT. In this way the SCCT is a form of collaborative prosumer wikinomics that emphasize openness, peering, sharing, and acting globally.[72] By drawing on a wide range of backgrounds and interests, the SCCT is able to harness the power of the trust instrument, not towards a single unitary end, but towards a pluralistic vision of renewable energy deployment.

III. Scaling Resilience Across Different Stakeholders

In the RPT method, we deploy scale to understand resilience claims and assets amongst differently situated actors, including importantly the state. We describe the resilience claims of individuals and institutions across three registers of hierarchical power, rhetorical claims, and material interests. These registers are scaled in that different actors will have access to different types of hierarchical power, rhetorical claims, and material interests.

Scale at its core is a concept of measurement and comparison. Institutions and access to institutions are rarely replicated at zero cost. When policies of a state are designed to promote large-scale resource delivery shift to smaller scale or renewable delivery, it will likely create externalities. Those externalities can create their own ecosystem of response (or practices). If the institutional incentives are built around incentivizing ownership of equipment by creating tax credits, then those outside of ownership but who desire to participate in the renewable energy economy will absorb higher costs with fewer benefits to do so. Thus, while tax credit financing has served large-scale energy deployment well because those credits could realistically only be realized by a large-scale producer of energy, when that same system is deployed to incentivize renewable technology, there is a scaling back of resilience for individuals outside the ownership paradigm.

A. Hierarchical Resilience.

Whenever the state through law defines an interest (like a tax credit that is accessible by an individual or a company), then the state is using its agenda-setting power to shape how that interest can be engaged by the different actors that will encounter the interest.[73] States have ventured to define certain types of "energy communities" that garner special access to incentives towards the creation of renewable energy access. While "energy communities" is both a descriptive and a

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EU Funding Programs FP7 and H2020 and Future Trends in Horizon Europe, ENERGIES Feb. 25, 2020, at 9-10; *see also* Penn, *supra* note 44.

72. Jakimowicz, *supra* note 20, at 13-14.

73. Calabresi & Melamed, *supra* note 19, at 1122.

techno-legal term, its power hierarchically lies in who it includes and who it does not.

Descriptively, energy communities are groups of citizens acting together to produce, consume, and benefit from renewable energy resources, such as the SCCT. Legally, the definition is narrower than the description in both the U.S. and European setting. The U.S. creates geographic definitions of energy communities based on targeted places for transition of former non-renewable energy sectors. Under the Inflation Reduction Act of 2022, an Energy Community falls into one of three categories: (1) coal closure energy communities, or a census tract in which a coal mine has closed after 1999, or in which a coal-fired electric generating unit has been retired after 1999; (2) fossil fuel energy communities or those that are economically tied via employment, or proximity, to the creation of energy through fossil fuel consumption; and (3) brownfields, or geographic areas whose expansion or redevelopment is complicated by the presence of hazardous substances or pollutants.[74] The Inflation Reduction Act focuses on these sites as potential places of transition by providing bonus credits for adopting renewable technologies.

In contrast, under the EU's Renewable Energy Communities Directive, an Energy Community is primarily organized around governance and geography.[75] Bjorn Hoops sets out a typology of five types of energy communities describing how they organize themselves around renewable resources.[76] These energy communities are shaped by market conditions along with the legal regulatory environment that defines geographic limits, participation, and access to existing infrastructure. The self-sufficient and inclusive community is built off a small grid that is only accessible to the household members of the residential area connected to the grid. By its nature, it is inclusive of those in the geographic zone where the grid is located but excludes those outside that geographic range.[77] Primarily located in neighborhood or small-population housing communities, the self-sufficient and inclusive community is often constructed as a part of the residential development that it serves. Small, local, and democratic energy commons draw on existing grid infrastructure, allowing for a larger footprint than the self-sufficient and inclusive energy commons. In the small, local and democratic energy commons, excess energy is fed back into the power grid providing members with shared revenue or lower energy costs from the excess energy.[78]

A third typology are communities that meet the criteria as place-based and medium sized energy commons. These communities generally draw on existing energy grid infrastructure but often contribute higher volumes of energy through scaled up resources. For example, place-based and medium sized energy commons may have solar farm installations and wind-farm installations, whereas

74. *See* Inflation Reduction Act, Pub. L. No. 117-169, 136 Stat. 1912 (codified as amended at 26 U.S.C. § 45)**;** *see also* John Bistline et al., *Economic Implications of the Climate Provisions of the Inflation Reduction Act* 10 (Nat'l Bureau of Econ. Rsch., Working Paper No. 31267, 2023).

75. J. Lowitzsch et al., *Renewable Energy Communities under the 2019 European Clean Energy Package – Governance Model for the Energy Clusters of the Future?*, RENEWABLE SUSTAINABLE ENERGY REV., Jan. 30, 2020, at 9.

76. Hoops, *supra* note 12, at 18-20.

77. *Id.* at 23-25.

78. *Id.* at 17.

small, local, and democratic energy commons often use smaller scale deployment of renewable resources, such as rooftops.[79] Interest-based Energy Commons mimic the placed-based medium size energy commons except that instead of geography- based determinants for stakeholder participation, membership is primarily driven by financial investment criteria or access to necessary resources for the community's success, such as expertise.[80] Finally, investment energy commons, mobilize rent-seeking in the renewable sector by limiting control to cities, financial institutions, or energy suppliers.[81]

The U.S. and European approaches to defining energy community trigger different responsibilities and benefits. While the European model reflects tensions around control, whether based geographically or proprietarily, the U.S. definition is primarily an incentive-based identifier, using tax credits to create greater renewable production in geographies whose labor market was or will be adversely affected by clean energy transitions. The tax credit incentive then is designed to attract producers of clean energy to these geographies by subsidizing their enterprise. Other tax credit programs incentivize individual production and consumption through renewable technologies. The production-oriented approach draws on demand economics as a measure of public commitment. While solar panels on homes can serve as a semiotic indicator of public commitments to renewables, renewables also face stark challenges towards adoption when subject to demand. Namely, as adoption of renewables remains costly, some adopters may struggle to maintain consistent energy supply, therefore limiting effective energy deployment to geographically limited zones where public incentives, natural resources, and consumer interests align.

The Solar Commons Community Trust leverages a different form of hierarchical power to facilitate adoption — property ownership. The SCCT is a type of communal property interest that seeks to leverage the savings generated from renewable energy sources towards communal projects, rather than individual or corporate profit.[82] Drawing on the foundation of trust law, the property form "provides an economic tool for community empowerment and engagement."[83] Drawing on the success of the community land trust model, the SCCT engages a trust protector to evaluate, control, and protect the interests and needs of the solar array hosts, trustees, and community beneficiaries, with its primary focus on protecting the trust asset for the beneficiaries.

One example of the flexibility exhibited is the way the SCCT model innovates renewable energy deployment by addressing key limitations of existing energy infrastructure for adopting a greater scale of renewable technology. One such limitation is the traditional ownership model of current energy providers, where energy deployment and production are scaled on a profit-loss vector. As noted above, the choice by certain providers to ramp up power production is often dependent on whether the provider is able to recoup the costs of initiating the power

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79. *Id.*; *see generally* Amy Morris et al., *Green Siting for Green Energy*, 5 J. ENERGY & ENV'T L. 17 (2014) (describing the necessity and yet challenges for distributed solar).

80. *Id.* at 22.

81. *Id.* at 29.

82. Milun et al., *supra* note 6.

83. *Id.* at 386.

production cycle — something highly dependent on costs of resources and costs of machinery and labor.[84] In contrast, the SCCT model starts from the conviction that the sun is a community resource that is capable of generating community wealth. The sun's power-producing rays enable communities to harness energy boosting technologies in parallel to existing energy infrastructures. Given the sun's limitless potential to generate greater energy resources, low-income communities can "name, claim, and legally reframe" energy production and consumption away from pure rent-seeking motivations to community-oriented values making projects.[85]

As the energy is produced, the beneficiaries (or community members) enjoy the fruits of the trust in two ways. First, because they are producers of energy in the energy marketplace, they now reap the benefits of lower cost energy consumption. Secondly, when the trust produces more energy than it consumes, the financial value of selling power back through the grid are reinvested in community enterprises. In the first SC 1.0 project, the benefit was given to a school, while the anticipated beneficiary of SC 2.0 is a UBI project for local tribal community members.

But it serves to point out that, in the U.S., the SCCT sits outside the legal definition of an energy community that would spread these benefits further. Expanding the definition of Energy Community beyond the geographic zones of former sits of energy production labor could mean greater deployment of renewable technologies while also serving disadvantaged communities with both lower costs of energy access and investment in local communities.

B. Material Resilience in SCCT

Material resilience can be found in the physical assets individuals can deploy to solve a problem. It can be measured by size, such as the extent of land holdings or the total wealth a community can aggregate to solve a problem. It can be compared by geography, such as rural versus communities where solar ray hours are greater, or where wind is more abundant. It can be compared by population, or the number of people impacted by a resource. Each of these delineations themselves can be combined to shape the way materiality effects access to resources. For example, the value of land and resources is often determined by size and by location. Urban geographies will have more people than rural geographies. In the energy sector, communities that produce greater amounts of solar power may be able to distribute those resources more easily. The SCCT navigates all of these comparisons of resources at various times.

On the one hand, at its core, the SCCT requires physical space (the *Res*) to produce solar power. The land is put into a trust, committing the physical space, the equipment, and the fruits produced from those resources to the objectives laid out by the SCCT. That space may be the top of a community building or a larger plot of land where a solar array may be placed. Identifying the land interest that can be used to physically locate the solar array may involve a bargaining of values between the owner and the community. In some solar settings, such as Indian Tribes, the community control of space and the economic benefits are controlled

84. Smith-Nonini, *supra* note 61, at 96; Schwartz & Graeter, *supra* note 55, at 1.

85. Milun et al., *supra* note 6, at 390.

hierarchically by the tribal government. Increasingly, Tribal communities have engaged with renewable deployment, leveraging their economic powers and sovereign status to build larger scale solar and wind farms than other types of collectives. To do so, many tribes have created new relationships with private actors to create grids, power sources, and delivery mechanisms to consumers. For example, the Choctaw Tribe of Oklahoma, in 2020, partnered with Oklahoma Gas and Energy to launch a 35 acre, 15,000 solar panel farm capable of producing 5 megawatts of power or enough energy to service 2,000 homes.[86] In doing so, the tribe has saved nearly $69,000 in utility costs for its members.[87] The tribal-private partnership, similar to the S.C. 2.0 project in Northern Minnesota, is a public-private partnership that leverages the role of a sovereign state, who has the power to solve certain problems, with private actors who benefit from being a part of the public problem-solving process.[88]

While the Choctaw Solar Farm is a top-down arrangement, the SCCT models describe the tribe as a passive beneficiary, rather than as a direct beneficiary. That is, the beneficiaries of the trust are largely members of the Bois Forte Band of Chippewas. The project sponsoring the project is the Bois Forte Food Sovereignty Group. But the tribe is not formally the partner in the trust, whereas the Choctaw nation is directly steering the application of the solar project within its territory. The physical location can also reflect the hierarchical limits on what can be done on land. Zoning laws, nuisance laws, and other planning requirements can limit the location of community-based renewable resources. Likewise, the amount of solar power or wind power can shape where the SCCT can be effectively deployed.

Second, the SCCT engages with material resilience in the start-up costs necessary to deploy solar-power-based systems. These costs can include not only the financial costs to make the energy consumable or storable, but also the expertise required to deploy these programs in communities. The state can offset the fiscal costs associated with adopting solar power but has tended to do so through ownership regimes that are driven through tax credit financing. That means that renters of homes likely are excluded because they either will choose not to invest in solar panels that they likely foresee leaving behind should their lease end, or they may simply be limited in making improvements on the house structure by the landlord.[89] Another challenge that small-scale energy communities face, particularly in isolated or rural locations, is the brain drain of expertise necessary to navigate

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86. Jack Money, *Choctaw Nation Solar Farm in Durant to Double in Size as OG&E invests in more renewable energy*, THE OKLAHOMAN (April 22, 2021), https://www.oklahoman.com/story/business/energy-resource/2021/04/22/choctaw-nation-partners-with-oge-for-durant-solar-farm-expansion/7319116002/.

87. *Choctaw Nation Invests in Renewable Energy*, UNITED FOR OKLA., https://www.unitedforoklahoma.com/story/solar-power-partnership/ (last visited Feb. 13, 2025).

88. Lynda L. Butler, *Private Land Use, Changing Public Values, and Notions of Relativity*, 13 WM. & MARY L. REV. 629, 629-32 (1992); *see, e.g.*, Eduardo Engel et al., *The Basic Public Finance of Public—Private Partnerships*, 11 J. EUR. ECON. ASS'N 83 (2013) (Public Private Partnerships have been a feature of neoliberalism and the decay of strong, state backed programs, deferring instead to private actors to solve public problems); RORY HEARNE, PUBLIC PRIVATE PARTNERSHIPS IN IRELAND: FAILED EXPERIMENT OR THE WAY FORWARD FOR THE STATE? (2011) (Public Private Partnerships have been encouraged by the department of the Interior for Tribes to address other challenges); Press Release, U.S. Dep't of the Interior, Interior Department Strengthens Public-Private Partnerships to Benefit Indian Country (Dec. 5, 2023), https://www.doi.gov/pressreleases/interior-department-strengthens-public-private-partnerships-benefit-indian-country.

89. Hammerle et al., *supra* note 17, at 1-2.

regulatory, technical, and legal obstacles that must be accounted for in setting up a cooperative.[90] The SCCT serves a "match making function" by marshalling the resources to install solar power resources while also identifying the spaces and resources necessary to deploy them.

Third, material resilience implicates the kinds of existing assets that currently are available to facilitate small scale energy communities, like the SCCT. While the SCCT has advantages as it works within the existing infrastructure of U.S. Energy technology,[91] access to and distribution through the electrical grid is both a predictability problem and a resource problem. One limit that converting power generation to renewable energy sources has is the unpredictable nature of solar power generation. Solar generation is an on-demand power source, which occurs at times when consumption is often at its lowest. This has led to what economists have referred to as the duck curve, where the most consumption occurs in the beginning or end of the day, while dipping during peak solar hours.[92] As solar and wind energy have become more ubiquitous, power plants have strategically reduced conventional power generation systems, pushing the belly of the curve deeper. What this means in practicality is that solar systems need storage capacity to effectively deploy energy within communities. Savitz's article on the challenges of adopting solar in the face of current infrastructure highlights this point.[93]

C. Rhetorical Resilience

Rhetorical resilience relates to the stories and values that communicate how we engage with resilience assets. For example, the resilience of ownership can be demonstrated by the size and placement of no-trespassing signs or other semiotics that communicate the certainty of ownership.[94] Rhetorical resilience claims and their interaction with governance hierarchies also are an important consideration for thinking through these problems. For example, Kathryn Millun's Solar Commons 2.0 Project anticipates using dashboards for users to log into to see how their use of renewable energy resources shapes their own energy consumptions and the community energy consumption.[95] In this format, the semiotics, or the signals of cooperation, are embedded in the architecture of the program.[96] This narrative of what information the governance body conveys, and how it is conveyed, interacts not only with the rhetorical and hierarchical scale but also the material scale — including what resources does the association deploy to further communication to

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90. Björn Hoops, *EU Directives on the Internal Governance of Energy Communities and Their Exclusionary Effects*, 17 J. WORLD ENERGY L. & BUS. 147, 161-62 (2024).

91. Milun et al., *supra* note 6, at 419.

92. Schwartz & Graeter, *supra* note 55, at 19.

93. Gwendolyn Savitz, *Saving Solar (and Wind) Power: Why We need to Emphasize Storage to Fully Transition to Renewables*, 46 ENERGY L.J. (forthcoming May 2025).

94. Lorna Fox O'Mahony & Marc L. Roark, *Property as an Asset of Resilience: Rethinking Ownership, Communities and Exclusion Through the Register of Resilience*, 36 INT'L J. FOR SEMIOTICS L. 1477, 1503 (2023) (comparing the size and placement of neighborhood signage with the same by Squatter occupations).

95. *See SC 2.0 Northern Minnesota*, SOLAR COMMONS PROJECT, https://solarcommonsproject.org/minnesota/ (last visited Feb. 25, 2025).

96. Smart platform communication has been studied in various contexts including the user interface of smart appliances. *See* Peter Bøgh Andersen & Martin Brynskov, *The Semiotics of Smart Appliances and Pervasive Computing*, *in* HUMAN COMPUTER INTERACTION: CONCEPTS, METHODOLOGIES, TOOLS, AND APPLICATIONS 552 (2009).

members.[97] To that end, is the communication used for informational purposes, for behavioral adjustments (shaming), or both is a concrete example of how understanding the role of these registers helps us understand the powers deployed.[98]

Another example, in how semiotics shape community buy-in and participation, is found in the visible art on walls at the Wright Elementary School in the Dunbar neighborhood, as well as the development of the Solar Commons board game.[99] This mural located on the side of a school that has been the beneficiary of funds generated through the Solar Commons Community Trust reinforces the community value of sharing energy. The developers of the project saw the public art installation and the development of the board game as a link connecting the "technical solution" embedded in the project to a commons institution.[100] In doing so, the role of the art installation is towards defining a new "common language" that allows the community to not only communicate about climate change but also to be participants in an alternative future.[101] Finally, the presence of solar panels themselves are a semiotic (or signal) that work to reinforce community participation and buy-in for both the work of the SCCT and the role of renewables.[102]

This role of participatory access is critical to gaining support by would be participants. As Dealessi and Lancianai's piece on *Obstacles of Realization* demonstrates, complexity tends to favor top-down approaches by energy companies rather than participatory approaches by consumers.[103]

IV. CONCLUSION: PROMOTING EQUILIBRIUM

Because Resilience comes from the embeddedness in institutions, RPT observes that for states to be sustainable, its institutions must also be sustainable.[104] When institutions are imbalanced in the way registers of resilience are conferred, there is a greater propensity to create outsiders who are impacted by the resilience conferred to insiders. RPT's methods emphasize the needs to take different resilience stakes serious — not only in expanding the lens from which we see multifaceted problems but also in understanding how individual stakeholders are treated differently when resilience gaps are not taken into account in policy decisions.

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97. Placement and intentional design interfaces have been considered integral for considering how to make smart cities more accessible. MATEJ JAŠŠO & DAGMAR PETRÍKOVÁ, SMART TECHNOLOGY TRENDS IN INDUSTRIAL AND BUSINESS MANAGEMENT 401 (Dagmar Cagáňová et al. eds., 2019).

98. Marlyne Sahakian, *'More, bigger, better' household appliances: Contesting normativity in practices through emotions*, 22 J. CONSUMER CULTURE 21 (2022).

99. Kathryn Milun et al., *The Role of Public Art in Solar Commons Institution-Building: Community Voices from an Essential Partnership among Artists, Community Solar Researchers, and Activists*, INTERDISCIPLINARY J. P'SHIP STUD., Dec. 17, 2021, at 2-3.

100. *Id.* at 7.

101. *Id* at 6.

102. Ozzie Zehner, Producing Power: The Somatization of Alternative Energy in Media and Politics 58-60 (June 2007) (Ph.D. dissertation, Univ. of Amsterdam Sci. & Tech. Studies); Prisca Augustyn, *Solar Energy Discourse in the Sunshine State*, 49 SIGN SYS. STUD. 63, 83 (2021); Anne-Christine Stéphanie Amélie Maassen, Solar Cities in Europe: A Material Semiotic Analysis of Innovation in Urban Photovoltaics 217 (May 2012) (Ph.D. dissertation, Durham Univ.), http://etheses.dur.ac.uk/3592/.

103. Francesca Dealessi & Andrea Lanciani, *Obstacles to the Realization of a Renewable Energy Community in Italy Due to the (Unnecessary?) Complexity of European and National Regulations*, 46 ENERGY L.J. 49 (2025).

104. FOX O'MAHONY & ROARK, *supra* note 14.

When resilience is conferred in a way that gives some stakeholders *de facto* veto power over the deployment of renewables, those left outside the decision-making tent are left with less resilience. For example, politicians in the U.S. still question whether climate change is the result of increased carbon in the atmosphere.[105] Industry actors question and lobby political actors based on the cost of transition to renewable resources, or whether the transition to renewables as a long-term solution is even possible.[106] In both of these instances, the rhetorical scale of the problem is shaping whether and how the state will deploy resources to support renewable energy development. We call this phenomena scale jumping, as it is often reflected in the use of one register of resilience to distort or frame out another register's resilience conferring action.[107] When these kinds of rhetorical stories are able to shape decisions by the state about what resources to devote to public problems, both politicians and industry actors with a vested interest create a permission structure for the state to either refrain from deploying resources to promote renewable resources or restrict it in a way that limits their own political exposure.[108] The effect is to distort access to resilience assets that shape energy consumption. Several groups are impacted by those choices, including immediate consumers whose access to energy is channeled away from alternative resources; communities who lack the resources to participate in the energy economy in any way but as consumers; amongst others. As Bloom's contribution on *Legal Commoning* demonstrates, the success and scalability of Renewable Energy Communities depends critically on the legal and regulatory environments in which they operate, shaping how these communities can engage in the energy economy.[109]

The SCCT (like other energy communities) reframes consumers as participants by both giving them a stake in the decision making for how the energy community develops but also in the outcome of the renewable project. This reframing of roles reorients property, not as an exclusionary tool, but as a sharable tool to protect the social objective of creating greater and cleaner access to energy.[110] When viewed through an RPT lens, both Energy Communities and the Solar Commons Community Trust balances the needs of the state, the needs of stakeholders, and the needs of the community to solve multiple problems, by creating and conferring resilience assets to community members.

105. Rachel Frazin, *Vance on Carbon Emissions and Climate Change: 'Let's Just Say That's True,'* THE HILL (Oct. 1, 2024), https://thehill.com/policy/energy-environment/4910800-vance-debate-climate-change-scientific-consensus-skepticism/.

106. Thomas Eichner & Rüdiger Pethig, *Lobbying for and Against Subsidizing Green Energy*, 62 ENV'T & RES. ECON. 925, 944-945 (2015).

107. Roark & Fox O'Mahony, *supra* note 28.

108. *See generally* Philippe Aghion et al., *The Impact of Regulation on Innovation*, 113 AM. ECON. REV. 2894 (2023).

109. Peter Bloom, *Legal Commoning: Legally Mobilizing Resilient Energy Commons,* 46 ENERGY L.J. 21 (2025).

110. Rashmi Dyal-Chand, *Sharing the Cathedral*, 46 CONN. L. REV. 647 (2013).