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Abstract

For partial fulfillment for his Master of Science in Environmental Policy from the Bard College's Center for Environmental Policy, Mr. Collin Adkins submitted his Master's Capstone titled "Land trust response to renewable energy siting challenges in New York." Within this report, Mr. Adkins "creates a baseline assessment of New York's land trusts that evaluates the extent to which land trusts are aware of and responding to the changing policies around renewable energy and its impacts on land use." The report goes further by suggesting five areas in which the Land Trust Alliance "can provide support to New York's land trusts to improve their preparedness around renewable energy siting." These areas are mission alignment, information flows, strategic planning, siting utility scale wind and solar, and easements and fee-lands.

Resource

See separate PDF attached.

LAND TRUST RESPONSE TO RENEWABLE ENERGY SITING CHALLENGES IN NEW YORK

Master's Capstone Submitted to the Faculty of the Bard Center for Environmental Policy

By Collin Adkins

In partial fulfillment of the requirement for the degree of

Master of Science in Environmental Policy

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I give my sincerest gratitude to all those that made this possible and to those whose names may not appear here but whose efforts are felt none-the-less.

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Table of Contents

Abstract iii
Executive Summary iv

Introduction 1

Perspectives on Renewable Energy's Presence in Land Conservation 4
- Land-Use Implications of Climate and Energy Policy 5
- An Old Debate Resurfaces 7
- A More Nuanced View of Local Renewable Energy Objection 11
- Conservation and Renewable Energy Trade-offs 14
- Reducing Renewable Energy Siting Tension 16

Survey Methodology and Limitations 19
- Survey Audience and Recruitment 19
- Survey Questions and Technique 20
- Statistical Analysis 22
- Limitations 22

Climate and Energy Baseline Survey Results 24
- Survey Sample of New York Land Trusts 24
- Climate and Energy Awareness 28
- Climate and Energy in Strategic Planning 32
- Attitudes Toward Wind and Solar 34
- Strategies Addressing Renewable Energy Conserved Land 38

Policy Recommendations 44
- Overview of Recommendations 44
- Mission Alignment 44
- Improving Awareness and Information Flows 46
- Climate and Energy in Strategic Planning 48
- Engaging Land Trusts in Siting Utility-Scale Wind and Solar 50
- Renewable Energy Associated with Easements and Fee Lands 52
- Conclusion 54

Bibliography 57

Appendix A: Survey Instrument 60
Appendix B: Survey Data Summary 75

Abstract

Energy policies promoting energy independence, grid modernization, climate change mitigation, and clean energy standards are a leading driver of land-use change in the United States. This has resulted in an increased pressure to develop land. The recent focus by states to expand renewable energy poses an interesting challenge to organizations dedicated to conserving open space and natural resources, creating a potential tension between competing "green" goals. In response, The Land Trust Alliance, a national organization supporting over 1,100 member land trusts, has recently set a goal to "empower land trusts to encourage the buildout of renewable energy facilities while steering the facilities away from sensitive lands through a pilot project in New York." This report creates a baseline assessment of New York's land trusts that evaluates the extent to which land trusts are aware of and responding to the changing policies around renewable energy and its impacts on land use. Using an online survey, 42 land trusts were sampled. The data was analyzed using simple aggregations and Spearman's Rank-Order Correlation tests. Survey results found that just under half of land trusts surveyed are beginning to form policies around renewable energy on conserved land yet only 7% are incorporating renewable energy into their strategic plans. This report suggests five areas in which the Alliance can provide support to New York's land trusts to improve their preparedness around renewable energy siting. These include: mission alignment, information flows, strategic planning, siting utility scale wind and solar, and easements and fee-lands. These focal areas present New York's land trusts with an opportunity to boost relevancy and/or visibility through engaging more deeply in a set of broader policy goals for New York State around climate and energy.

Executive Summary

Meeting renewable energy targets will require a period of rapid renewable energy development including new infrastructure, which will consequently increase pressures to develop land (Gentry, Pickett, & DeMarchis, 2010). At the same time that New York's energy plan, Reforming the Energy Vision (REV), is promoting a roll out of renewable energy sources in the form of solar, wind and hydro, the state is also prioritizing open space conservation in the its latest Open Space Conservation Plan. Therein lies a latent tension between two "green" agendas: conserving land on the one side, and promoting renewable energy on the other.

Land conservation organizations—land trusts—in New York provide an opportunity to examine land-use policy lessons for other land conservation organizations across the country facing similar transformations of their energy systems. Likewise the Land Trust Alliance (the Alliance) recently announced a goal to, "empower land trusts to encourage the buildout of renewable energy facilities while steering the facilities away from sensitive lands through a pilot project in New York," as part of a new climate change initiative. To date, the extent to which land trusts are incorporating threats posed by renewable energy expansion into organizational practice and policies has been unclear.

Between 2007 and 2011, an area roughly the size of Maine was developed into new energy infrastructure in the United States (Trainor, McDonald, and Fargione, 2016). New York is expecting substantial new energy infrastructure in the next several years. The state's Clean Energy Standard (CES) is expected to result in over 13,000 megawatts of new installed generation capacity (NYSERDA, 2016). In a 2016 cost study, the New York State Energy Research and Development Authority (NYSERDA) estimated that most of the new

installation will come from on-shore resources, principally distributed solar, land-based wind, and utility-scale solar. According to land-use estimates from the National Renewable Energy Laboratory (2012), meeting the CES would require 136 km^2 and 700 km^2 of land be developed for utility-scale solar and on-shore wind, respectively (Stein & O'Boyle, 2017).

Siting renewable energy projects has at times galvanized local opposition, sometimes categorized as Not-In-My-Backyard (NIMBY) behavior. However, using a label like NIMBY to explain local opposition to renewable energy siting masks a more nuanced understanding of what particular elements of a wind or solar project opponents find conflicting (Petrova, 2016). Land trusts often possess information and maps useful to responsible energy planning such as species sensitivity maps (Gasparatos, Doll, Esteban, Ahmed, and Olang, 2017), conservation priority maps (NWF, 2014), climate resilient areas (OSI, 2016), and community needs (Atencio, Forbes, & O'Hara, 2013). Consequently, some scholars have suggested that land trusts are in a unique position to reduce siting tension (Atencio et al., 2013; Gentry et al., 2010; Stein & O'Boyle, 2017).

This report addresses the evolving tension between open space conservation and renewable energy development through a survey of New York's land trusts. Forty-two (48.8%) land trusts responded to an online survey consisting of multiple choice, priority ranking, Likert-scale ranking, and open-ended questions. Analysis consists of group aggregations of survey results as well as Spearman's Rank-Order Correlation tests assessing the magnitude and direction of association between pairs of ordinal, ranked variables.

The survey results present multiple findings that constitute a first step to understanding to what extent land trusts are internalizing and responding to renewable energy issues. Overall, the results suggest that New York's land trust community is beginning to

weigh organizational policy regarding renewable energy. From these findings, this report identifies five focal areas for further consideration as a first step to guiding the Alliance's pilot programming associated with the Climate Change Initiative. These include: mission alignment, information flows, strategic planning, siting utility scale wind and solar, and easements and fee-lands. Collectively, these focal areas present land trusts with an opportunity to boost relevancy and/or visibility through engaging more deeply in a set of broader policy goals for New York State around climate and energy.

Mission Alignment

The Land Trust Alliance has an opportunity to illustrate to their members and to policy makers, how land trusts' work is already addressing climate change as a means to opening a conversation about renewable energy. To this end, the Alliance can partner with state and national green energy, energy efficiency, and climate groups to explore areas of alignment with land trust missions. Context within land trusts' missions and their concern for climate change may be important to ensure the Alliance's services are relevant. For example, when asked whether land trusts' missions contribute to twelve given issues, climate and energy issues were the least common areas of alignment. Meanwhile, two thirds of survey respondents were largely concerned about the impacts of climate change to their commitment to perpetuity, while notably close to a fifth of the survey respondents are not concerned. Once an explicit connection between the organization's mission and climate change is established, there may be sufficient basis for discussion around the need to transform New York's energy system and the role of land trusts in meeting that end.

Information Flows

Setting climate and energy on land trusts' agendas is a first step to opening discussion for innovating around climate and energy challenges, as opposed to taking them on a case-by-case basis or avoiding those challenges altogether. Survey results indicate that overall awareness of two landmark climate and energy policies, the Paris Climate Accord and REV, were modest, which suggests New York land trusts as a whole may not be greatly aware of climate and energy policy drivers at the state-level and beyond. Where these policies have been discussed, the outcome is generally seen as good for conservation or as carrying with it some pros and cons. Additionally, about a quarter of land trusts reported that they have identified a staff or board member who is internally considered a leader on climate and energy issues. The Alliance should therefore also consider means of connecting land trusts to climate and energy experts as an additional strategy to broaden land trust engagement in these issues.

Strategic Planning

Despite overall gaps in policy awareness, the survey results suggest that climate change and related energy sprawl appear to be growing concerns amongst New York's land trusts. New York's land trusts identified guidance incorporating climate and energy into strategic plans as the top need in order to effectively weigh organizational policy towards these issues. The Alliance can increase its initiatives' effectiveness in this area through providing individualized services—as is already practiced in circuit-rider approaches to providing services—in addition to more general strategic planning resources like its online learning center. Presently, less than half (45%) of New York's land trusts sampled have strategic

plans that address climate change and just 7% indicated their plan addresses renewable energy. At the same time, 50% of respondents said their land trust has already encountered renewable energy development in their service area. Integrating climate and energy expertise into the Alliance's pre-existing services could potentially boost the prevalence of climate change and renewable energy in land trusts' strategic plans.

Siting Utility Scale Wind and Solar

Survey results also suggest that additional guidance is necessary in order for New York's land trusts to meet the Alliance's goal to "encourage the buildout of renewable energy facilities while steering the facilities away from sensitive lands." Land trusts surveyed indicated that there are concerns over local impacts from renewable energy infrastructure and that information about potential projects could determine the organization's level of support. High priority information for New York land trusts to weigh organizational policy towards wind and solar include: impacts to wildlife, the type of land where wind/solar is being sited, scenic impacts, public opinion of the land trust, and size of the project. The Alliance could therefore help organize land trusts around renewable energy through issuing guidance on best practices for engaging with proposed utility-scale renewable projects under state siting guidelines for utility-scale energy siting.

Easements and Fee-Lands

Survey results further suggest renewable energy generation potential does not currently influence most New York land trusts to any great extent when setting their conservation goals and managing their properties. Still, the pace of the energy transformation in New York

is accelerating and the state's land trusts are already reporting conflicts between existing easements and renewable energy systems as well as challenges drafting new easement language to allow responsible siting of renewable energy. The Alliance can aid those land trusts grappling with this issue by developing guiding principles for "integrated conservation projects," disseminating model easement language that responsibly accommodates renewable energy, and collaborating with State Energy Authorities and other relevant stakeholders to find least-conflict solutions to land-use challenges.

Introduction

New York is one of many states on the verge of a sweeping energy transition. A fiercely contested and politicized federal climate change agenda has led States and local governments to take on a greater role in scaling up renewable energy (Goulder and Stavins, 2011). Governor Andrew Cuomo's administration (2011-present) has identified atmospheric carbon reduction as a critical policy goal in order to improve human health and mitigate impacts from climate change (Rosenweig, Solecki, Degaetano, O'Grady, Hassol, & Grabhorn, 2011). To achieve these goals, the administration released the 2015 New York State Energy Plan, also dubbed Reforming the Energy Vision (REV), as a pathway toward energy reform. REV includes initiatives to accelerate deployment of renewable energy as well as update New York's energy infrastructure (NYSERDA, 2015). Within REV, New York's Clean Energy Standard (CES) sets an ambitious target of meeting 50% of the state's energy needs with renewable energy by 2030 (NYSERDA, 2015). Meeting renewable energy targets will require a period of rapid renewable energy development including new infrastructure, which will consequently increase pressures to develop land (Gentry, Pickett, & DeMarchis, 2010).

At the same time that New York is promoting a roll out of renewable energy sources in the form of solar, wind and hydro, the state is also prioritizing open space conservation in the its latest Open Space Conservation Plan as another means to address climate change (NYDEC, 2016). This sets up a potential tension between two "green" agendas in New York and other states attempting energy reform policies. On the one hand, promoting renewable energy achieves greenhouse gas reduction, as well as shifting the economy to new energy technologies that may improve economic competitiveness and lower electricity rates (NYSERDA, 2015). In addition, siting solar or wind farms on open space exposes

landowners to new sources of income, or at least cost-saving incentives (Gentry et al., 2010). On the other hand, land prioritized for open space conservation has the potential to also be targeted for renewable energy development (CCEQ, 2017). Competition over siting renewable energy infrastructure will therefore involve trade-offs during a transition to a greener economy with potential repercussions for open space (Cameron, Cohen, and Morrison, 2012).

For many years private land conservation nonprofits, collectively called land trusts, have protected land under the threat of development through purchasing land—or fee simple purchase—and voluntary land-use restrictions called conservation easements[1]. New York land trusts (NYLTs) therefore provide an opportunity to examine land-use policy lessons for other land conservation organizations across the country facing similar transforming energy systems. The Land Trust Alliance (the Alliance), a national association supporting over 1,100 member land trusts recently announced a $2 million, four-year initiative to help the nation's land trusts adopt climate mitigation and adaptation practices. The goals of the initiative are threefold. The Alliance aims to "increase the number of land trusts whose strategic conservation plans address climate impacts and promote climate resilience," "promote the use of land to mitigate climate change through the ability of soils and vegetation to absorb and store carbon," and "empower land trusts to encourage the buildout of renewable energy facilities while steering the facilities away from sensitive lands through a pilot project in New York, which will help land trusts in other states effectively navigate similar challenges."[2] To

[1] Land trusts may also acquire land and easements and confer them to other non-profits or government agencies (Greene, 2005). Conferring land into land trust possession may also be imposed as a permitting condition to mitigate environmental damage (Pidot, 2005).
[2] Land Trust Alliance official climate change initiative announcement: http://www.landtrustalliance.org/taxonomy/term/3

date, the extent to which land trusts are incorporating threats posed by renewable energy expansion into organizational practice and policies has been unclear.

This thesis addresses the evolving tension between open space conservation and renewable energy development through a review of academic and conservation practitioner literature as well as independent research surveying 42 land trusts in New York State. The overall findings suggest that NYLTs are beginning to weigh organizational policy towards renewable energy. Land trusts have an opportunity to grow their impact through representing their mission's alignment with similar green agendas, act as information brokers, incorporate climate change and renewable energy into strategic planning, engage with wind and solar developers, and prepare for scenarios involving renewable energy on easement and fee-lands.

This report begins with a review of the literature on the nature of uncertainty in conservation, renewable energy sprawl, and conflicts surrounding renewable energy siting. The following chapter then uses these prior debates to inform the methodology for a case study of New York land trusts (NYLTs) via an online survey and discusses the results. The report concludes with recommending policy for approaching least-conflict scenarios between NYLTs and renewable energy development.

Perspectives on Renewable Energy's Presence in Land Conservation

Protected areas in New York play an important role in the state's environmental and socio-economic well-being. As noted earlier, New York is one such state that has advanced policy (i.e. REV) with the position that renewable energy is both an economic and environmental solution while simultaneously prioritizing open space conservation for its environmental and economic benefits. To date, land trusts in New York State have protected over 500,000 acres through in-fee acquisitions, over 700,000 acres through conservation easements, and over 900,000 acres reconveyed to other non-profits or government agencies (LTA, 2015). A New York Department of Environmental Conservation (NYDEC) report noted that open space conserved by land trusts helps support the state's $54 billion outdoor recreation and tourism industry, $36 billion agricultural industry, and $20.5 billion forest products industry (NYDEC, 2016).

Drawing on social science literature, law reviews, climate science literature, and practitioner reports, this chapter focuses on some of the existing debates in land conservation about challenges and opportunities facing the land conservation community as a result of climate and energy policy. The chapter discusses scholarly perspectives on the land-use implications of recent energy policy, the efficacy of conservation tools in light of changing climate and energy landscapes, NIMBY-ism, and the need to manage uncertainty in conservation. Chapter 3 then uses questions raised in the literature to inform a survey of NYLTs.

Land-Use Implications of Energy Policy

Policies touted as "win-win" solutions for environmental conservation and human well-being often overshadow the trade-offs that occur in implementing those policies (McShane, Hirsch, Trung, Songorwa, Kinzig, Monteferri, … O'Connor, 2011). To use one land-use example from an international development context, "win-win" biofuels policy in Peru espoused cleaner, more renewable fuel sources while spurring economic opportunity through job growth in growing and processing biofuels (McShane et al., 2011). Similar biofuels mandates in the United States, Brazil, and Southeast Asia has resulted in conversion of arable land for food production and undeveloped land into biofuel feedstock production, which Fargione, Hill, Tilman, Polasky, and Hawthorne (2008) estimate will result increase in greenhouse gas emissions. Research by McShane et al., 2011 acknowledges that not all trade-offs are apparent upfront, but that none-the-less "win-win" rhetoric masks an underlying reality of complex give-and-take scenarios. The clean energy transition in New York may prove to be another example where trade-offs obscured by "win-win" policies will surface.

A recent emphasis on American energy independence combined with efforts to support economic recovery after the 2007/08 recession, has led to a period of energy sprawl nationwide. By the end of 2011, the Department of Energy funneled billions of dollars into creating jobs, energy research, and infrastructure development as part of the American Recovery and Reinvestment Act (ARRA) (Carley & Hyman, 2013). From 2007 to 2011, an area roughly the size of Maine was developed into new energy infrastructure as a result of a 15% increase in energy production (Trainor, McDonald, and Fargione, 2016). Domestic energy production is expected to rise another 27% from 2013 levels through 2040 (EIA, 2013).

Despite some policy makers' attempts to align energy, climate, and open space policy, the push for energy independence continues to result in land-use transformations. Trainor et al. (2016) estimates that 800,000 km^2—greater than the land area of Texas—will be required to accommodate the anticipated rise in U.S. energy production when spacing requirements are included, one-fourth of which will be directly impacted by energy infrastructure. Renewable energy offers a potential solution to energy sprawl in that renewable sources like wind and solar can be sustained indefinitely on the same land base, while extractive resources such as coal and oil need to continually mine and drill new areas (Trainor et al., 2016).

New York is expecting substantial new energy infrastructure in the next several years. The CES mandate as part of REV is expected to result in over 13,000 megawatts of new installed generation capacity (NYSERDA, 2016). NYSERDA (2016) estimates that most of the new installation will come from on-shore resources, principally distributed solar, land-based wind, and utility-scale solar (Figure 1). According to land-use estimates from the National Renewable Energy Laboratory (2012), meeting the CES would require 136 km^2 and 700km^2 of land be developed for utility-scale solar and on-shore wind, respectively (Stein & O'Boyle, 2017). However, other models from NYSERDA (2016) also indicate that the amount of new on-shore installations could be greatly reduced under scenarios with greater energy efficiency savings, higher costs of solar development, and lower costs for offshore wind development.

Land trusts in New York have already begun to experience the fallout from aggressive energy policy from energy sprawl, which stands to undermine the progress that's been made to preserve the state's open space and natural resources (NYDEC, 2016). Tension between

private land conservation organizations and renewable energy development therefore marks land trusts' first direct impact from climate change (Gentry et al., 2010) via the technology that is meant to abate it.

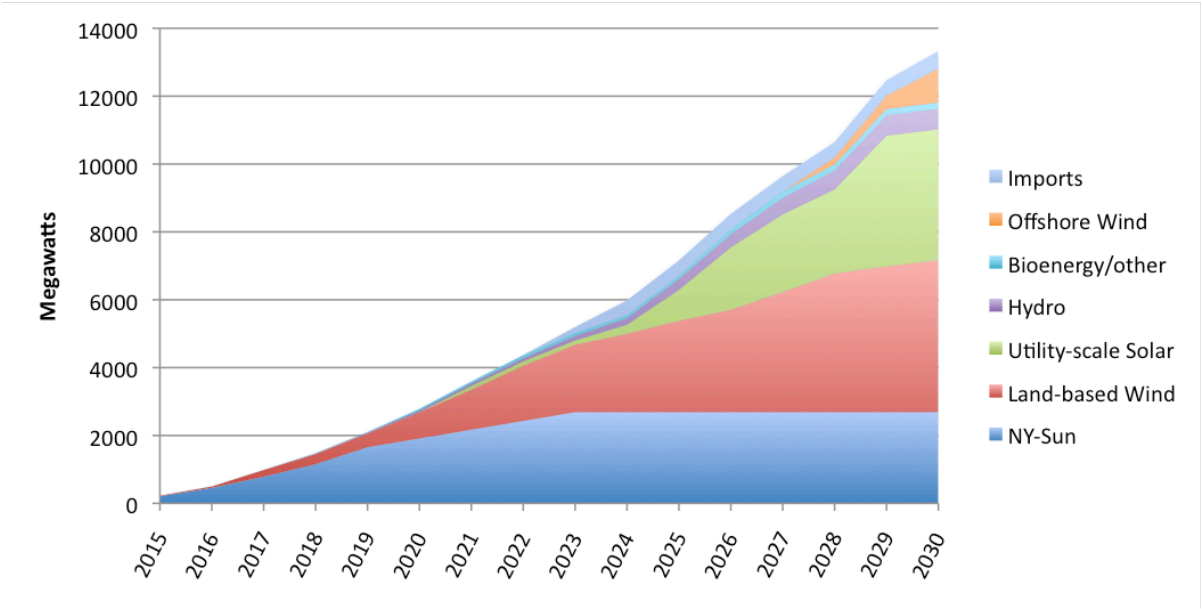

Figure 1: Installed capacity projections in NY by technology/program. Above projections are based on a baseline scenario that does not include additional scenarios with greater energy efficiency savings, higher costs of solar development, and lower costs for offshore wind development. Source: NYSERDA, 2016. Clean energy standard white paper: Cost study. April 8, 2016.

An Old Debate Resurfaces

In order to examine the conflict between renewable energy systems and land conservation, it is useful to review a prior and ongoing debate within conservation circles: how to conserve in perpetuity that which is always changing. One commonly used tool within the land trust community is a conservation easement. Conservation easements are permanently enforceable restrictions to the title of a privately held property for the purposes of maintaining open space

or natural values while allowing the landowner the right to certain landowner uses such as farming, ranching or forestry within the terms of the easement (Shindledecker, 2006).

Although the first land trust was founded in Massachusetts in 1891, conservation easements did not become common practice until much later (Shindledecker, 2006). Since the 1981 Uniform Conservation Easement Act, the number of land trusts in the U.S. has more than quadrupled to over 1,600 nationwide (LTA, 2015). Land trusts can range in size from all-volunteer groups with one or two easements to the world's largest land trust, The Nature Conservancy, with over 1,600 easements and active chapters in every state (Pidot, 2005). The number of land trusts and their use of conservation easements continues to grow today (Pidot, 2005).

Not all conservationists are in agreement about the efficacy of the conservation easement tool. Bray (2010) points to a present contradiction created by the federal tax structure requiring that easements be constructed for perpetuity while "changing circumstances and doctrines of law" are allowing easements to be extinguished or amended. Whether critics take the perspective that conservation easements are creating inflexible inefficiencies by locking in land use or that they do not go far enough to ensure conservation values are permanently upheld, both viewpoints display ample skepticism concerning the manner of perpetuity (Bray, 2010; Pidot, 2005). Merenlender, Huntsinger, Guthey, and Fairfax (2004) argue whether present day scientific understanding of socio-ecological interactions can adequately stipulate the legally binding management of conserved properties. Introducing climate change and rapidly changing energy technology adds another layer complicating the question of whether perpetuity is potentially achievable.

Acquiring land and easements is only the first step of land trusts conservation process. Land trusts must also maintain the conditions of the property in perpetuity according to a baseline report and the conditions set by the easement, a process commonly referred to as "stewardship" (Greene, 2005). Easements are to be held and maintained by a land trust or government agency as stewards of the property acting in ways where regulations are unable to accomplish the same goals. Moreover, proper stewardship commensurate with the highest public trust obligates land trusts sustain and enforce their easements to ensure long-term benefit to the public (Pidot, 2005). Conservation science, however, rarely uses conservation easements or land trusts as the unit of analysis to evaluate their relative effectiveness of achieving conservation goals (Merenlender et al., 2004).

The public has a legitimate interest in making sure that land trusts' acquisitions and conservation easements do not mishandle public trust (Pidot, 2005). Public trust, where land *trust* gets its name, refers to the responsibility of the nonprofit organization to conduct its business in a manner that confers public benefit, not private gain (Atencio, Forbes, & O'Hara, 2013). Conservation easements convey public trust though both active (e.g. recreation) and passive (e.g. ecosystem services such as wildlife habitat) uses as a function of the tax subsidies released to a landowner in compensation for conferring one or more land-use rights (Bray, 2010).

Therefore, the land trust model for conservation offers flexibility where other approaches to natural resources conservation struggles. The appeal of conservation easements as a tool for protecting public trust stems from increasing costs for government to manage land, partisan gridlock over land management and resource regulations, and the inability for a centralized regulatory authority to respond to local communities (Merenlender

et al., 2004). Conservation easements therefore strike a balance to private landowner independence through voluntary, incentive-based resource protection as opposed to more command-and-control approaches (Bray, 2010). This puts the land trust community a unique position be effective where political stagnation could otherwise prevent land protection in the public interest, for example in the case of politicized renewable energy policy (Gentry et al., 2010).

Land trusts' responsiveness to local affairs, their bipartisan appeal, and their specialized knowledge give them the ability to obstruct bad renewable energy development and say, "yes" to good projects (Gentry et al., 2010). For example, research by Cameron et al. (2012) noted that conservationists have an incentive to engage with developers to help steer project planning towards lands with less conservation value, an intrinsically more attractive option to both parties. Additionally, Howard, Schlesinger, Lee, Lampman, and Tear (2016) found that both wind developers and land trusts could see a greater return on investment if projects are sited in a way that minimized development in high biodiversity areas.

Renewable energy and conservation agencies, however, have yet to come into agreement as to what makes a "good" wind or solar project. In a joint press release, the Defenders of Wildlife, Earthjustice, National Audubon Society, Natural Resources Defense Council, Sierra Club, Union of Concerned Scientists, and Western Resource Advocates (2008) acknowledged that widespread adoption of renewable energy at any scale will need to be compatible with other land uses to reduce their impact. These impacts differ with respect to project scale as well as the relative strength of protections placed on conserved lands. In cases where the land trust owns the property outright, it is unlikely the land trust will allow

the development if it could be argued to be outside the organization's mission. On existing easements, the question becomes more difficult. Landowners with conservation easements are being approached with offers to develop lands with high wind or solar potential (Doscher, 2010), however developers may or may not know of the existing restrictions attached to the title of the property, which creates an opening for easement violations. How a land trust interprets easements and whether or not it would allow areas to be withdrawn from the easement for the purposes of renewable energy could set precedent for the organization's remaining easements (Gentry et al., 2010).

A body of evidence points to the reality that difficult trade-offs exist between conservation and development goals (McShane et al., 2011). Trade-offs, especially amongst environmental groups, has created tension over competing goals for open space planning and management (Petrova, 2016; van der Horst, 2007). Research by van der Horst (2007) has shown that on aggregate local residents with positive place-based attachment is correlated with objection to proposed renewable energy projects. Positive-place based attachment is often the case with land trusts protecting land culturally, aesthetically, agriculturally, and/or ecologically important to public benefit. Research has also shown however, that a simple 'no' vote of opposition masks a more fine-grained understanding of such opposition (Petrova, 2016; Carlisle, Solan, Kane, and Joe, 2016).

A More Nuanced View of Local Renewable Energy Objection

A 2016 bipartisan voter survey by The Nature Conservancy (2016), found broad public support for the adoption of wind and solar energy amongst New York voters. Popular support, however, does not guarantee public acceptance during local development (Petrova,

2016). NIMBY-ism—or Not-In-My-Back-Yard behavior—is often cited as a barrier to wind and solar development (Carlisle et al., 2016; Petrova, 2016; van der Horst, 2007). NIMBY-ism in the context of renewable energy siting is more accurately defined as opposition in practice to a project that is generally agreed to be beneficial in principle (van der Horst, 2007). The trouble with using a label like NIMBY to explain local opposition to renewable energy siting is that it masks a more nuanced understanding of what particular elements of a wind or solar project opponents find conflicting (Petrova, 2016). NIMBY-ism often carries with it a pejorative connotation, insinuates selfishness, and/or suggests ignorance yet is still widely used (Carlisle et al., 2016; Petrova, 2016; van der Horst, 2007).

Researchers have made steps in breaking down NIMBY dynamics, which carries some specific lessons for land trusts. Van der Horst (2007) found that residents in the UK that derived a positive identity from a particular rural aesthetic were likely to resist wind farm development especially if they also lived in the area. Carlisle et al. (2016) describes this as place attachment and has also found adverse reactions to disturbances that threaten an individual's association with a special place. When one considers that land trusts themselves are dedicated to preserving a certain landscape, this effect is likely to be true for members and supporters of local land trusts. Researchers continue to debate the effect of proximity to renewable energy projects and overall attitudes, with studies that site either a positive or a negative correlation with proximity (Carlisle et al., 2016).

Petrova (2016) describes a "green versus green" phenomenon where both supporters and opponents of a renewable energy project use pro-environmental arguments. For example, supporters of a renewable energy project will argue the benefits of reducing harmful greenhouse gases, while opponents will argue the extent of local environmental impacts from

the project. McShane et al. (2011) describe the green-versus-green debate in another way: as nature protectionists defending protected areas versus social conservationists wishing to reform the static conservation model. Both perspectives point to issues of transparency in decision-making that is detrimental to conservation goals. Transparency in this context refers to open acknowledgement of the reasons behind decision-making.

Research has found that improved information sharing and community outreach can help to reduce conflict created by NIMBY-ism between land conservation and renewable energy development. Petrova (2016) found that historically one of the main contributors to local opposition stems from local residents feeling excluded from the decision-making process. Land trusts often possess information and maps useful to responsible energy planning such as species sensitivity maps (Gasparatos, Doll, Esteban, Ahmed, and Olang, 2017), conservation priority maps (NWF, 2014), climate resilient areas (OSI, 2016), and community needs (Atencio, et al., 2013).

Where land trusts are not attune to community needs, or have otherwise followed a static approach to conservation, filling community needs like community-owned renewable energy production, responding to climate change, or responding to changing agricultural practices may not be possible (Atencio et al., 2013). As a result, land trusts can find themselves in a state of triage, moving from one crisis to the next, where not receptive to the broader needs of the community (Atencio et al., 2013). The field of conservation has been described as that of a of a "crisis discipline," where decisions are routinely made in the face of considerable uncertainty (McCarthy & Possingham, 2007). A growing body of literature is pointing to the benefits of explicit rhetoric involving trade-offs as an antidote for addressing

that uncertainty and triage. Specifically the next section will speak to uncertainty and conflict between land conservation and renewable energy development.

Conservation and Renewable Energy Trade-offs

To further analyze the tensions between renewable energy development and open space conservation, this section reviews some of the existing literature where land conservation has previously encountered trade-offs with energy systems. In some cases examples of conservation values conflicting with renewable energy have been documented, however the issue continues to be a moving target. Land trusts balance a number of conservation values and priority setting in decision-making (Shindledecker, 2006) and so must weigh a number of trade-offs. Where renewable energy and land conservation come into conflict Gentry et al. (2010) offer three guiding principles that land trusts can follow to reduce negative externalities and aid responsible energy siting: minimize the amount of trade-offs that need to be made, carefully weigh the trade-offs that need to be made, and ensure that promised gains are realized after the trade-offs occur. Trade-offs vary depending on which conservation value(s) an easement seeks to protect. For example, land trusts often find their easements concerned with the aesthetic qualities of a particular piece of property or with the viewshed—or scenic vista—to which their easements are a part of.

Smardon (1979) notes that there is also a strong precedent for aesthetic considerations in America's public trust and environmental laws. At times land trusts explicitly include the aesthetic or natural beauty local landscapes in their mission statements. Glare from solar panels, shadow flicker from turbines, visual obstruction/intrusion, and a perceived loss in property value are commonly sited causes for local opposition to renewable energy projects

(Carlisle et al., 2016; Petrova, 2016). While the industry has mitigated impacts through engineering solutions and better siting (AWEA, 2008), localities sometimes oppose projects simply on aesthetic grounds.

Agricultural lands are another focal point for land-use trade-off debates. Land Trusts frequently purchase agricultural easements, where renewable energy and agricultural interests compete over the flat, open space suitable for solar energy production. The San Joaquin Valley of California is a prime example of where agriculture and solar PV have been trying to find areas of least conflict. Pearce, Strittholt, Watt, and Elkind (2016) approached this challenge through spatial analysis identifying least-conflict areas with high solar PV potential and avoiding groundwater resources, prime soil, unique microclimates, and culturally significant areas. Pearce et al. (2016) identified 46% of the nearly 10 million acres of farmland as least-conflict areas. In this case, low-conflict areas consisted of drainage-impaired land with moderately or strongly saline soils that received Natural Resources Conservation Service indexes of poor or very poor (Pearce et al., 2016). Their analysis anticipates that the least conflict zones can accommodate up to 3,000 megawatts of solar energy generation, enough to meet California's Renewable Portfolio Standard of 33% energy from renewable sources by 2020, but shy of the nearly 12,000 megawatts needed for a climb to 50% by 2030 (Pearce et al., 2016).

On-shore wind power also poses trade-offs with ecological conservation values. Analysts frequently cite wind turbine collisions with birds and bats as an environmental impact from wind energy. Wind energy is often proposed for upland, windy areas, which are also targeted for protection because of high ecological value (Gasparatos et al., 2017). Opponents of wind energy frequently point to the Altamont Pass wind farm installed in

California in the 1970s, where turbines were concentrated along ridgelines now known to make excellent golden eagle habitat (Soto, 2007). Since that time a considerable amount of research has gone into studying wind-wildlife interactions and now many studies report the collisions are less alarming as once thought. The 2014 State of the Birds report estimated the number of birds killed by wind turbines is around 251,000 compared to the nearly 2.6 billion estimated bird deaths attributed to domestic and feral cats (NABCI, 2014). Hein, Gruver, and Arnett (2013) estimated that bat fatalities at turbines are higher on average than for birds but with greater intraregional variability, suggesting high mortality may be occurring where turbines are sited near roosts or hibernacula. These studies would seem to suggest that the direct impact to wildlife from wind energy is less severe than other sources but are in agreement that sensitive and threatened species deserve special consideration when siting wind farms if to avoid conflicting with conservation values specific to bird and bat habitat.

Reducing Renewable Energy Siting Tension

As stated earlier in this chapter, New York State is pursuing aggressive renewable energy targets (NYSERDA, 2015) and the pressure to develop private land is continuing to rise (Trainor et al., 2016). While renewable energy systems pose some risks to conserved lands, it also poses opportunities for more resilient landscapes and stronger land trusts. Rather than the “green versus green” scenario observed by Carlisle et al. (2016), others see land trusts as a potential unifier across political, social, and environmental boundaries to reduce tensions over renewable energy siting (Gentry et al., 2010; Stein & O’Boyle, 2017). As noted earlier, the flexibility and popularity of using conservation easements and the non-partisan nature of the IRS land conservation tax credit enables land trusts to reach beyond partisan politics to

protect conservation values (Bray, 2010; Gentry et al., 2010). Since conservation easements exist as a way for civil society to protect public interest (Pidot, 2005), where the public has decided that renewable energy is in their long-term benefit, properties that are held in easements can accommodate distributed, renewable energy systems to an extent practicable.

Amidst a growing effort to site renewable energy "smart from the start" (Pearce et al., 2016), researchers are beginning to study how land trusts fit into a least-conflict scenario. Conservationists can benefit from identifying not only those areas with high conservation value, but also areas of low conservation value suitable for renewable energy development as a way to reduce renewable energy siting inefficiencies and avoid being viewed as obstructionist (Cameron et al., 2012). For example, an examination of solar potential in the Mojave Desert by Cameron et al. (2012) found that that private land frequently had lower conservation value but was a disincentive for developers that would need to stitch together several parcels for large-scale deployment. Howard et al. (2016) used a paired return-on-investment approach to examine the costs and benefits of siting wind farms amongst New York's conservation land. They found that New York may be able to accommodate upwards of 16,000 megawatts of installed capacity while avoiding biodiversity conservation priorities, a more than sufficient amount to meet NYSERDA's (2016) anticipated new installed wind capacity.

Recent literature outlines an additional approach: integrating land in conservation with renewable energy generation to an appropriate extent. Stein and O'Boyle (2017) identified land trust properties as potential hosts to renewable energy generation. If they choose to do so, land trusts have the local knowledge and education capacity to mobilize support for renewable growth through identifying suitable sites, supporting community solar

projects, or designing easements to include renewable energy generation (Stein & O'Boyle, 2017). Such was the case in Vermont in 2015, where solar leasing combined with an easement from the Vermont Land Trust created revenue to keep Whitcomb Farm in operation. Though the case is not yet well-documented, it stands as an example where a land trust helped open the door to the state's then largest solar array at 15 acres and 3.6 megawatts (Ledbetter, 2015). Stein and O'Boyle (2017) note, however, that in order for land trusts as a whole to be available to accommodate renewable energy infrastructure on their fee-owned lands their mission statements must be aligned or expanded from pristine conservation stewardship to "integrated conservation projects."

Scholars and practitioners agree that no amount of legal protections guarantee the perpetuity of private conservation work in a fundamentally uncertain future (Merenlender et al., 2004; Greene, 2005; Pidot, 2005; and Bray, 2010). Understanding the nuances of land trust attitudes towards wind and solar in New York State may be a first step towards crafting guidance and policy recommendations that are attuned to uncertainties inherent in private land conservation and that focus on adaptation rather than perpetuity. A logical next step is to learn from the practices of land trusts currently involved in this issue. The next chapter of this report will outline the implementation for a survey of NYLTs and the basis for its analysis in this report.

Survey Methodology and Limitations

In consultation for the Land Trust Alliance, this research creates a baseline gauging how New York land trusts perceive and respond to challenges posed by renewable energy sprawl. The previous chapters argued that energy sprawl as a result of climate change policy is a mounting issue that land trusts must adjust policies to in order to maintain their pledge of perpetuity. Adapting to these threats will vary by land trust depending on organizational capacity, awareness/prioritization of the issue, and alignment with the mission of the organization, as well as other intrinsic and extrinsic factors (Gentry et al., 2010; Moser and Eckstrom, 2010; NWF, 2014). Once a baseline is established, the Land Trust Alliance, policy makers, and the land trusts themselves may have a reference point for future inquiries into least-conflict resolution with renewable energy development.

Survey Audience and Recruitment

This research analyzes a representative sample of New York's land trust community that reflects a range of organizational capacity, service area, and interests. New York is among the country's top performing states in private land conservation. New York ranks fourth in the nation for number of active land trusts (87) and fifth in total area conserved (2,729,829 acres) (LTA, 2015). Furthermore, NYLTs are diverse in size and scope. Twenty-five percent of NYLTs are active in urban areas, 41% are active in suburban areas, and 78% are active in rural areas (LTA, 2015). NYLTs are supported by over 400 full- and part-time employees, however organizational capacity within each land trust ranges from all-volunteer groups to organizations with several dozen staff members (LTA, 2015). At the same time, NYLT

annual budgets range from a few thousand dollars to several million dollars with a median of roughly $63,000 (LTA, 2015).

Land trust participants were selected to participate in a climate and energy survey based on their participation in the Land Trust Alliance's 2015 Land Trust Census. The Alliance maintains census data for 97 organizations that have conserved land in New York, however some are active across state lines or are no longer active. For simplicity, survey recruitment was limited to 86 land trusts currently active in New York. Respondents were asked to consult with colleagues and respond with the organization's official position. A copy of the survey questions was sent with the invitation email to allow respondents time to prepare their answers, discuss with colleagues, and gain consensus before completing the online survey. Invitations were sent between December 7-9, 2016 and the survey remained open until Jan 31, 2017. Herein, names of individual organizations and other identifying information are reported in a manner that maintains the anonymity of the organizations and respondents. The Institutional Review Board of Bard College approved this research.

Survey Questions and Technique

The survey was designed with three primary goals in mind. First, the survey was intended to gauge land trusts' level of awareness of climate and energy issues/policy. Second, the survey asked land trusts to self-report organizational positions and practices related to wind and solar development. Where applicable the survey distinguishes between solar and wind technology to discern whether the land trusts surveyed exhibit any kind of preference to one technology or the other. Lastly, the survey seeks to understand where climate and energy issues stand relative to other organizational priorities. The survey uses the Paris Climate

Accord and REV as proxies for awareness of policy drivers from the state level and beyond. The survey did not consider town or local-level policies. The survey was constructed with input from the Alliance, private consultants, and academic advisors.

The survey was designed as mostly multiple choice, priority ranking, and Likert-scale ranking questions for simplicity and ease of completion. However, it also includes opportunities for open-ended, narrative answers. In the latter case specifically, the survey asks for respondents to elaborate on the circumstances, experiences, and outcome of any encounters the organization has had with renewable energy development (Appendix A, question #17) as well as asking land trusts to share draft easement language and/or policies pertaining to renewable energy (Appendix A, question #27). Thus, the survey was designed to balance to some extent the desire for specific examples and a prescribed categorization of responses.

The survey also attempts to account for the aforementioned diversity of organizational capacity. With each question, the survey acknowledges the breadth of experience and capability that each organization may or may not have. For example, many small land trusts may not have a strategic conservation plan, which is where climate and energy goal setting is likely to take place. Thus, some questions refer to organizational practice rather than possible documentation as in questions #7-8 (Appendix A), which ask about setting the organization's conservation goals and the stewardship and management of properties more broadly. At the same time, the survey asks for the presence of such documents as a strategic conservation plan and whether that plan addresses climate and/or energy in questions #23-25 (Appendix A).

Statistical Analysis

Portions of the survey analysis utilize Spearman's Rank-Order Correlation to test the magnitude and direction of association between pairs of ordinal, ranked variables. This will help determine how land trusts are treating the same variable with respect to two different scenarios (e.g. wind versus solar; or goal-setting versus stewardship). The Spearman test assumes the relationship between the two variables is monotonic and non-linear because of the arbitrary-set boundaries between ordinal categories. For example, the difference between "influences a little" and "somewhat influences" is not the same as "somewhat influences" and "influences," thus the actual relationship between two variables on the same ordinal scale will not be linear due to inherent subjective differences in the way respondents rank their answers.

Limitations

Several limitations to this survey and its approach exist. This sample was potentially biased towards organizations that had the organizational capacity to fit the survey in to an otherwise busy time of the year while the survey was open. Moreover, the survey may also biased by organizations that already prioritize climate and energy issues and thus were more inclined to respond to a climate and energy survey. While participants were asked to gain consensus at their organization prior to completing the survey, research suggests that consensus within conservation is difficult to fully achieve (McShane, et al., 2016). Van der Horst (2007) also warns that groups may avoid being perceived as NIMBY and so survey responses may not necessarily reflect real-life actions.

Much of the survey is subjective in nature, which presents some challenges to analysis. Participants were asked to rank certain choices in their responses, which are subjective representations that are not uniform from organization to organization. For example, two or more respondents may have ranked "invasive species" as their highest priority consideration when setting management goals, and yet they may not be able to respond to this priority in the same way due to differences in budget, human resources, or other factors. In attempting to gauge land trusts' internalization of climate and energy challenges, some questions asked whether certain factors "strongly influenced, influenced, somewhat influenced, influenced a little, or not at all influenced" certain land trust functions in order to acknowledge a range of potential outcomes. Responses to this style question are also subjective and the marginal difference between categories is open to interpretation.

Perhaps most limiting to its findings, the survey takes a broad approach with limited depth. This is in part because of the project nature of this report as a baseline for understanding New York's land trust response to climate and energy. Because research into land conservation and renewable energy using land trusts as the unity of analysis is limited, this survey necessarily needed to cover a lot of ground to achieve the goals of the project. At the recommendation of Land Trust Alliance and academic advisors, this survey represents a first pass at what is a very complex and evolving nexus of energy, climate, and land-use policy. This research is intended to provide a first step, providing a basis for further research as well as practical knowledge to inform the Alliance's advocacy and training in New York.

Climate and Energy Baseline Survey Results

New York is host to emerging conflicts surrounding renewable energy siting where green agendas compete for open space: mitigating climate change on the one side and open space conservation for resource protection on the other. Forty-two (48.8%) land trusts responded to an electronic survey[3] sent via email intended to illicit insight into how land trusts are internalizing and responding to climate and energy challenges. Overall, the results presented in this chapter suggest that the state's land trusts are beginning to adjust weigh organizational policy around renewable energy. Where not otherwise cited, summary survey data can be located in Appendix B.

Survey Sample of New York Land Trusts

NYLTs protect a variety of lands in the state for many purposes (i.e. conservation values). Of those land trusts that responded to the survey, more than half of the land trusts in the state are active in multiple counties or are active statewide (Figure 2a). Most are active in rural landscapes, however there is a fair amount of overlap with suburban and urban service areas (Figure 2b). The most common focal areas for land conservation in this sample is wildlife habitat, followed by recreational lands, wetlands & wetland buffers, scenic views, riparian areas, agricultural lands and cultural/historic lands (Table 1). Least common lands protected include working forests, coastal areas, and residential areas as well as written in responses for "municipal" lands, "ecological" lands, "cliff and talus; geological resources," "special groundwater protection areas," "urban waterways & former industrial" lands, and "community gardens" (Table 1).

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[3] Hosted by SurveyMonkey: www.surveymonkey.com

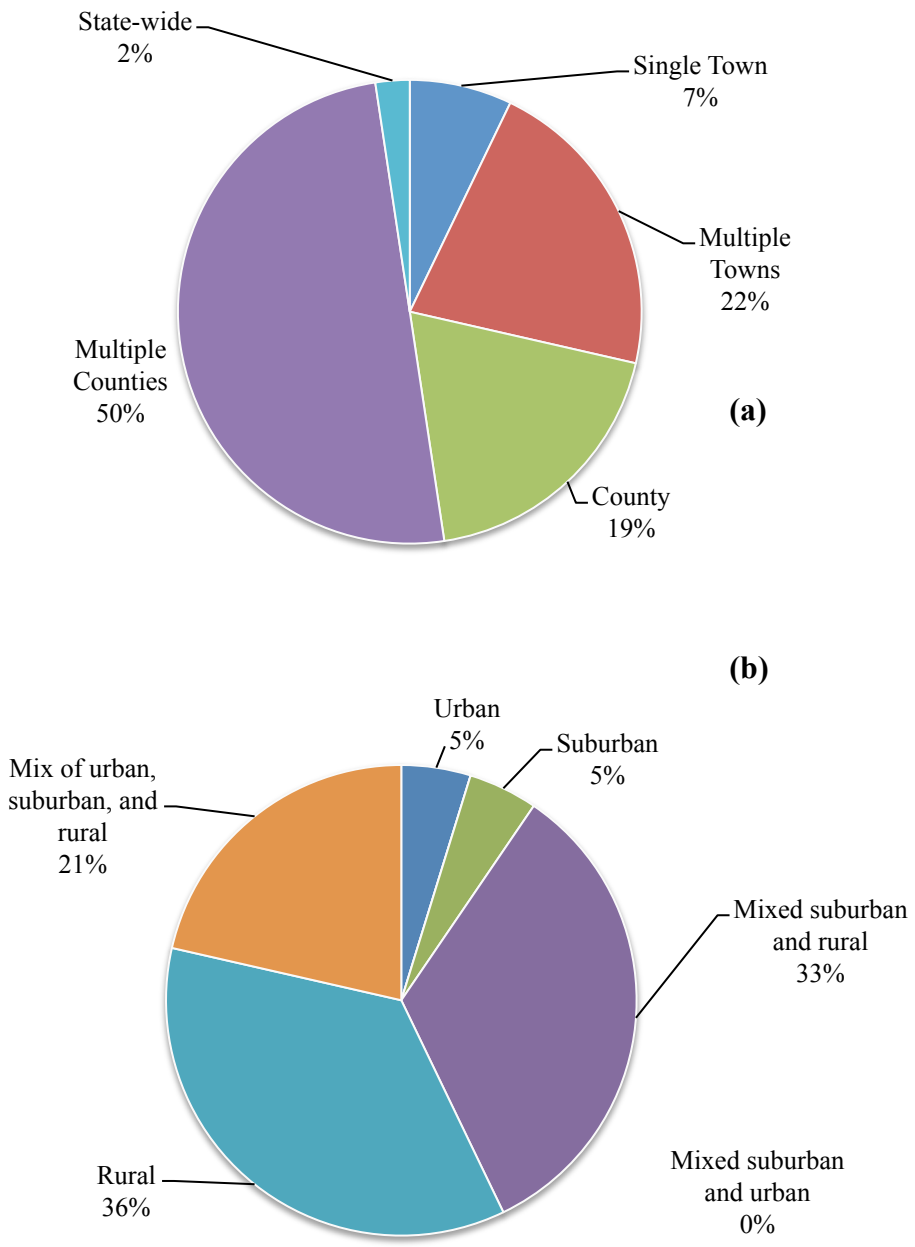

Figure 2: (a) Regional scope served by NYLTs along (b) urban, rural, and suburban gradients

Table 1: Focal areas for land protected by NYLTs

Type	Percent of Sample	"Other" Option
Wildlife Habitat	88%	
Recreational	83%	
Wetlands/ Wetland Buffers	83%	
Scenic Views	81%	
Riverside/ Riparian	69%	
Agriculture	64%	
Cultural/ Historic	52%	
Working Forests	43%	
Coastal	17%	
Residential	14%	
Other	2%	Municipal - Conservation easement
	2%	Ecological
	2%	Cliff and talus; geological resources
	2%	Special groundwater protection areas
	2%	Urban waterways & former industrial
	2%	Community gardens

Survey question 3, Appendix A.

Survey respondents expressed an overall concern about the impacts of climate change to their commitment to perpetuity. Two thirds of respondents indicated that they are concerned, ranking their concern as between 7-10 out of 10 with 10 meaning "greatly concerned" (Figure 3). Yet, figure 3 also shows that close to a fifth of the survey respondents show little or no concern (0-3) for climate change as it relates to their commitment to perpetuity. The survey analysis did not statistically test for a correlation between concern for climate change and whether an organization believed their mission contributed to supporting the adoption of clean energy. However, figure 3 indicates how those who do believe their mission is aligned with supporting clean energy (n=6) came almost entirely from the group most concerned about climate change.

In contrast to their level of concern for climate impacts, NYLTs did not widely view their organization's mission as contributing to issues around climate and energy. In fact, out

of the twelve content areas[4] climate and energy issues were the 1st-5th least common areas of alignment (Figure 4). However, within that group almost as many land trusts indicated a mission alignment with climate change adaptation and raising climate change awareness as did land trusts that see their mission contributing to protecting air quality.

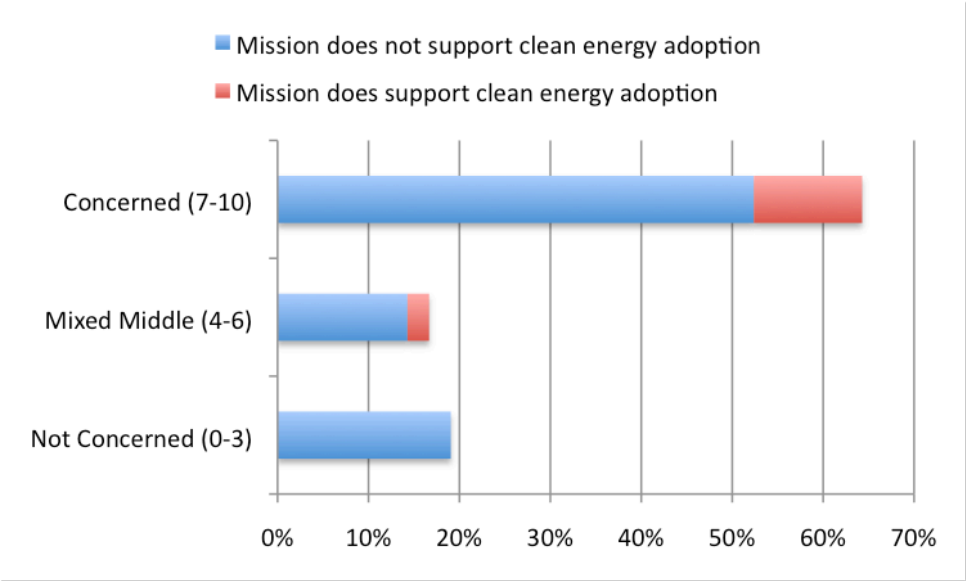

Figure 3: Reported level of concern for climate change's impacts to perpetuity and whether mission supports the adoption of clean energy (Survey questions 6 & 22, Appendix A)

[4] Survey question 6, Appendix A

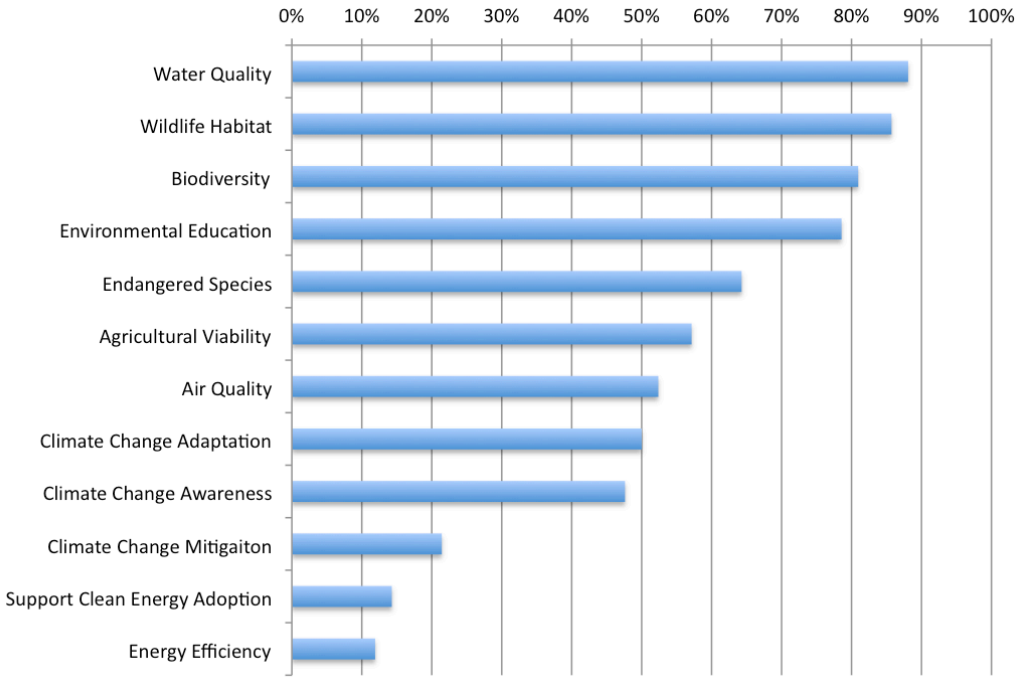

Figure 4: Percent of survey respondents indicating mission alignment with twelve issues (Survey question 6, Appendix A)

Climate & Energy Awareness

Survey results indicate that overall awareness of two landmark climate and energy policies, the Paris Climate Accord and REV, were modest, which suggests NYLTs as a whole may not be greatly aware of climate and energy policy drivers at the state-level and beyond. Figures 5a-b display the extent to which NYLTs discuss either the Paris Climate Accord or REV within their organization. The Paris Climate Accord was only somewhat discussed by 17% of respondents, while 21% have discussed REV and another 5% said they discussed REV often. Where these policies have been discussed, the outcome is generally seen as good for conservation or as carrying with it some pros and cons (Figure 5c). Compared to the number of respondents that are aware of and discussing the Paris Climate Accord and REV, 59.5% of

respondents indicated that they are either somewhat involved or often involved in government relations.

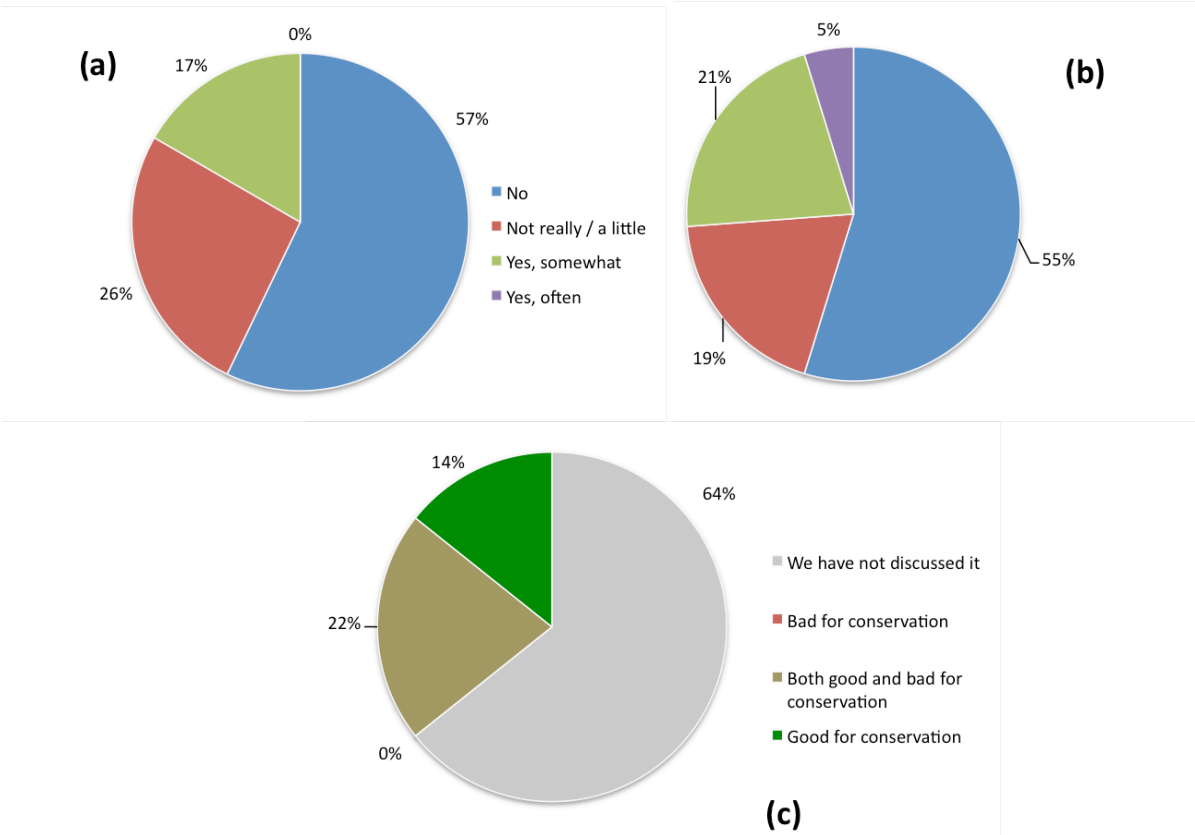

Figure 5: NYLTs reporting whether (a) the Paris Climate Accord or (b) REV have been discussed internally as well as (c) the perceived outcome of state and national policies to reduce greenhouse gasses (i.e. Paris and REV) (Survey questions 12-14, Appendix A)

Land trusts are actively seeking information about climate and energy issues in addition to traditional conservation topics. Table 2 displays the percent of survey respondents seeking information on a variety of topics. Demand for information about renewable energy permitting processes lags behind that of managing land for climate change and well behind traditional conservation information such as invasive species management (Table 2). Getting

climate and energy issues onto the organizational agenda may be slowed by factors internal to the organization. For example, roughly one in four of respondents indicated that they have a staff or board member who is identified internally to be a leader on climate or energy issues. Additionally, one in five survey respondents reported having difficulty accessing any of the information they were seeking, which points to a potential challenge in internalizing available resources. One resource in particular, the Alliance's climate website[5], may be underutilized as 91% of survey respondents indicated they visit the site "not very often" or have never visited the site.

Table 2: Percent of respondents seeking information on the following

Topic	Percent
Invasive species management	93%
Managing land for climate resiliency/adaptation	74%
Managing coastal areas, riparian corridors, or wetlands for climate change	50%
Pipeline or fracking news	40%
Energy conservation/efficiency	31%
Managing land for carbon storage	31%
Renewable energy permitting processes	19%

Survey question 10, Appendix A.

Survey results indicate, however, that NYLTs still encourage their members to take a variety of climate-friendly actions (Table 3). In fact, more survey respondents indicated that they encourage their members to switch to clean energy (17%, Table 3) than indicated their mission contributed to the adoption of clean energy (14%, Figure 4). These results suggest a disparity between groups that believe their mission contributes to the adoption of clean energy and those that encourage their members to do the same. Figure 6 would suggest that the support for the adoption of clean energy amongst survey respondents is actually 13% higher when land trust communications to their members and supporters are included than a

[5] climatechange.lta.org

perceived mission alignment alone (Figure 4). The survey did not explicitly ask if land trusts felt any other aspects of their work supported the adoption of clean energy. Moreover, the survey was not so explicit as to uncover causes of or correlations within this discrepancy. In summary, climate and energy awareness among survey respondents is tempered but with some positive signs that over a quarter of those surveyed support a transition to clean energy in some way and many more are actively seeking and communicating climate-related information.

Table 3: Percent of land trusts encouraging climate-friendly actions through land trust communications

Action	% of Respondents
Plant trees	64%
Conserve water	40%
Reduce their carbon footprint	33%
Conserve energy	29%
Switch to clean energy	17%
Drive less / practice fuel efficiency	14%
Reduce agricultural greenhouse gas emissions	2%

Survey question 31, Appendix A

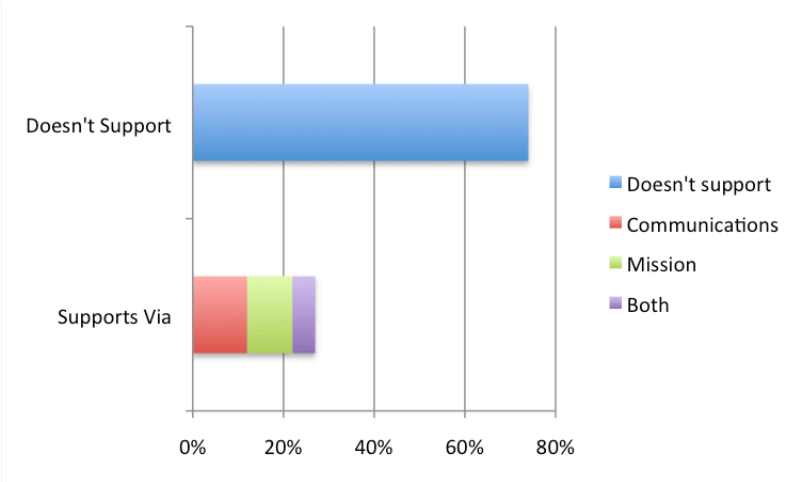

Figure 6: Land trust support for clean energy via mission alignment and communications to support base

Climate and Energy in Strategic Planning

Overall, climate change and a related energy sprawl appear to be growing concerns amongst NYLTs. Of the 88% of survey respondents that indicated they have a strategic conservation plan in place, are currently developing a strategic conservation plan, or are revising their strategic conservation plan, less than half (45%) indicated that the plan addresses climate change and just 7% indicated their plan addresses renewable energy (Figure 7). Yet, half (50%) of the survey responses indicated that their land trusts have already encountered situations with renewable energy development in their service area. At the same time, 47% of respondents said their land trust either has or is developing policies/easement language regarding renewable energy on conserved land.

Trends in the data emerge by separating respondents into three groups based on their inclusion of renewable energy and climate change in their strategic plan. Group A consists of land trusts that indicated their strategic plan addresses renewable energy while Group B consists of land trusts that indicated their strategic plan addresses climate change but not renewable energy and Group C consists of land trusts that either do not have a strategic conservation plan or whose plans address do not address either climate change or renewable energy (Figure 7). Each group includes land trusts that have completed their strategic plan or are currently developing or revising their plans and less than half of those surveyed have strategic conservation plans that address either climate change or renewable energy (Figure 7, Table 4). Group A had more full-time staff per land trust on average than Group B and C and more frequently reported having a leader on climate and energy issues in house (Table 4). Furthermore, Group A was on average more concerned about the impacts of climate change to their commitment to perpetuity and also reported greater support for the adoption

of clean energy via mission alignment and external communications than Groups B and C (Table 4).

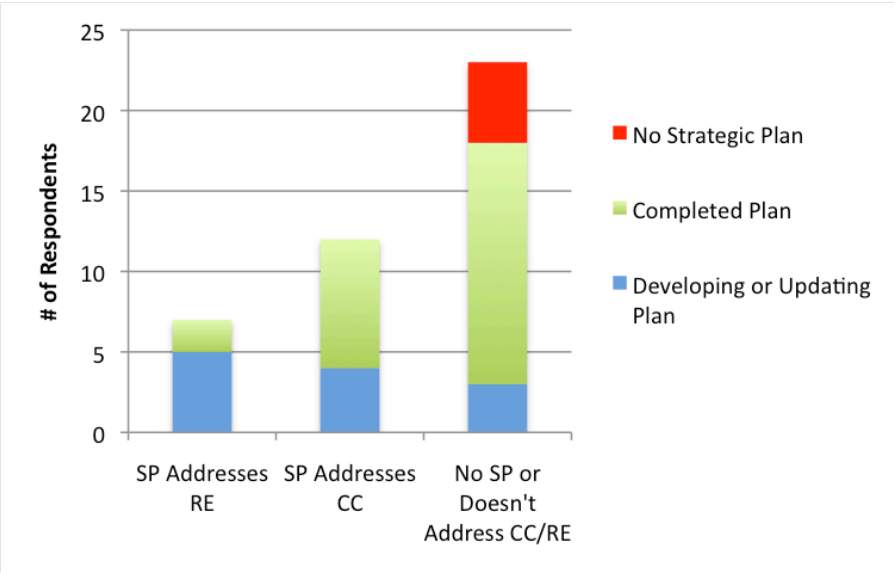

Figure 7: Land trust strategic conservation plans by group

Table 4: Characteristics of land trust strategic plan groups

	Group A SP Addresses RE	Group B SP Addresses CC	Group C No SP or Doesn't Address CC/RE
Group Total	7	12	23
Developing or Updating Plan	5	4	3
Completed Plan	2	8	15
No Strategic Plan	0	0	5
Mean Full-Time Staff	8.00	7.64	3.45
Has CC/RE Leader (% of Total)	12.20%	9.76%	4.88%
Mean Concern for Climate Change (out of 10)	8.43	7.33	5.30
Mission Supports Adoption of Clean Energy (% of Total)	7.14%	4.76%	2.38%
Encourages members/supporters to switch to clean energy (% of Total)	7.14%	4.76%	4.76%

SP – Strategic Plan
RE – Renewable Energy
CC – Climate Change
Source: LTA (2015) and Appendix B. Survey questions 6, 22-25, 30-31, Appendix A.

Attitudes Toward Wind and Solar

When asked to rank what information would be of greatest priority for NYLTs in order to weigh organizational policy towards wind and solar on or near conserved land, impacts to wildlife, the type of land where wind/solar is being sited, scenic impacts, public opinion of the land trust, and size of the project were the highest prioritized on average (Appendix B). With respect to the type of land where projects are sited, one respondent reported,

> "We are OK with projects in farmlands - that seems to us to be a compatible land use. We are not in favor of projects that fragment the core forest area of [region], which is one of our priority areas for protection. There are currently two projects in this area. One has been in the works for 5+ years and the other has just started. We are hopeful neither will be completed."

Survey results confirm that scenic impacts were on average rated as more important information for wind than for solar within the sample of NYLTs. Additionally, using

Spearman's Rank Correlation Coefficient test[6], results suggests that each variable for wind was positively correlated with the same variable for solar (Table 5). This implies that as a variable for wind increases in priority the same variable for solar also increases in priority, meaning the same variable for wind and solar were not statistically independent of one another. The degree of correlation between variables for wind and solar ranged from moderate (rho=0.4483, Size) to tightly correlated (rho=0.8171, Wildlife Impacts) out of a possible range of -1 (perfectly negatively correlated) to +1 (perfectly positively correlated).

Table 5: Comparison of priority rankings for wind and solar factors

Spearman Comparison of Wind and Solar Rankings					
Variable	Average Rank (Solar, DV)	Average Rank (Wind, IV)	n	rho	p
Wildlife Impacts	2.61	2.58	32	0.8171	0.0000
Land Type	3.26	4.11	33	0.7667	0.0000
Scenic Impact	4.28	2.78	35	0.5661	0.0004
Public Opinion	5.13	5.91	30	0.4710	0.0086
Size (Land Area)	5.14	5.06	35	0.4483	0.0069
Farmland Availability	5.77	6.15	33	0.7236	0.0000
Mitigation	6.38	6.42	33	0.7030	0.0000
Distance to Conserved Land	6.97	6.17	32	0.7968	0.0000
Emissions Offsets	7.29	7.46	32	0.6732	0.0000
Property Values	7.79	7.51	33	0.7501	0.0000

DV – Dependent Variable
IV – Independent Variable
Rank Scale: 1- Most important; 10- Least important. Variables were ranked relative to one another within wind and solar categories.
rho - Spearman's rank correlation coefficients
p - Associated probabilities (p) of safely rejecting the null hypothesis given that it is true. Null hypothesis: each variable for wind and solar are ranked independent of one another.

Survey results further suggest renewable energy generation potential does not currently influence most NYLTs to any great extent when setting their conservation goals and

[6] Testing the null hypothesis that each variable was ranked independently for wind and solar, the probability of committing a type-I error did not exceed a 1% level of significance.

managing their properties. Similar results to Table 5 were obtained when Spearmans test for correlation between variables of highest/lowester priority with respect to property management and stewardship[7] (Appendix B). Furthermore, Figure 8 compares the relative influence of three factors on setting conservation goals. Habitat value, a traditional and long-established conservation value, was reported as either influencing or strongly influencing conservation goals by 97% of survey respondents. Comparatively, carbon storage was reported to influence conservation goals by 13% of respondents, somewhat higher than the 3% reporting that renewable energy is an influence.

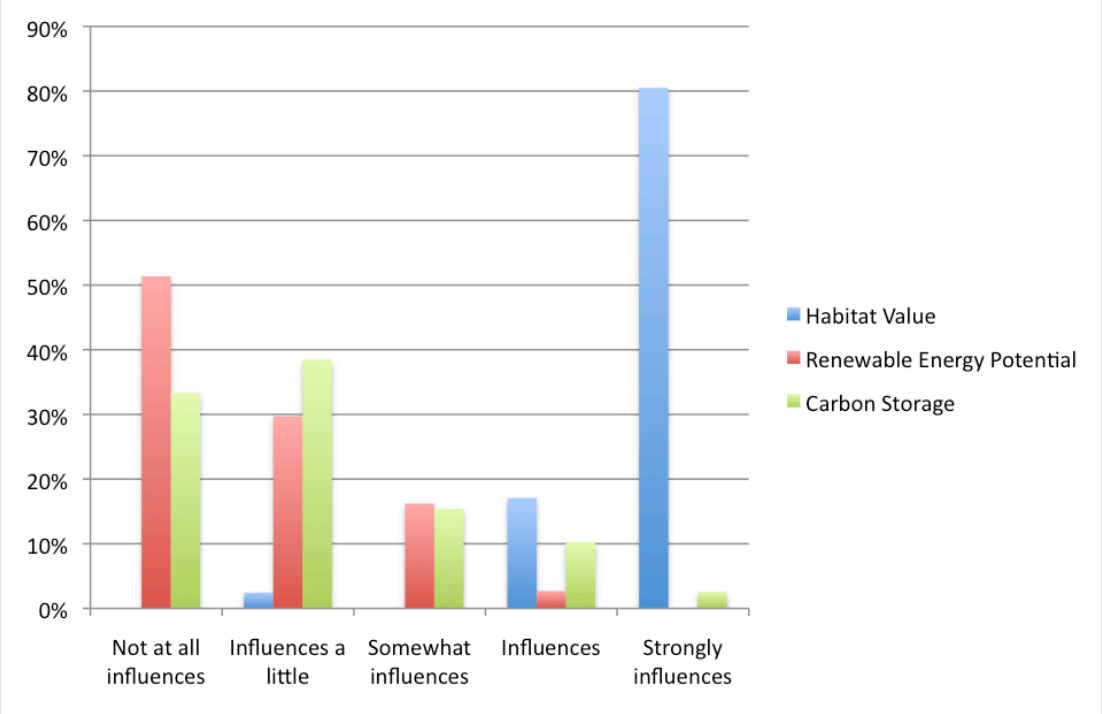

Figure 8: Relative influence of three factors on setting conservation goals (Survey question 7, Appendix A)

[7] Spearman's rank correlation coefficients were positive and significant for all nine variables tested.

With respect to a hypothetical situation of the presence of renewable energy on conserved lands, survey results suggest NYLTs are aware that wind and solar come with pros and cons for conservation and also feel that the scale at which either is deployed would ultimately determine how the existence of such technology would reflect the organization's mission (Figure 9). The majority of the responses reflected mixed feelings towards wind and solar as well as the scale to which both would be deployed. Those who did indicate a negative or positive response, more respondents viewed wind as a negative (29%) rather than positive (2%) reflection of their organization's mission while attitudes towards solar were relatively the same (17% negative, 14% positive).

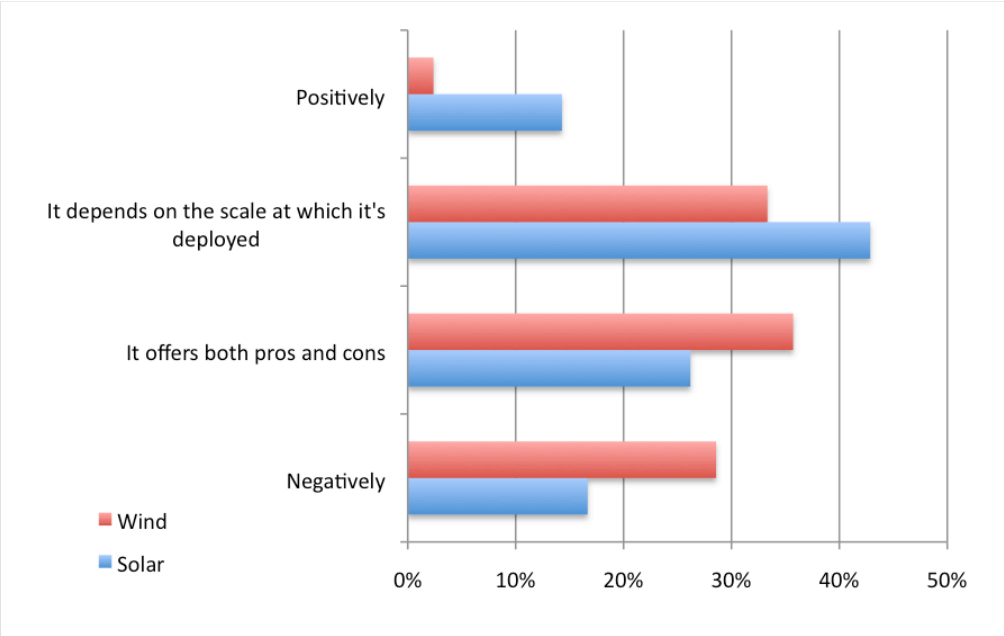

Figure 9: Reflection of organization's mission from hypothetical existence of wind or solar on conserved lands (Survey questions 18-19, Appendix A)

Open-ended survey responses further support that NYLTs view allowing renewable energy development on conserved land as a matter of scale. Many commented that commercial generation is generally not allowed or that renewable energy was allowed on easements for

residential use or only on previously existing structures. While commercial generation was noted to conflict with older easement language, one land trust did concede that they were considering new language for future easements. Another respondent noted their organization limits the development of solar photovoltaics under their impervious surfaces clause up to 2% of total area in the easement, measured by the area of ground underneath solar panels. This position contrasts with opinions in the literature that photovoltaics do not impede rainwater penetration (Cook & McCuen, 2013).

While this survey did not explicitly study the size threshold preferences land trusts have towards wind and solar, it is worth noting that multiple organizations did report interactions with solar development where size was a factor. One organization reported, "A current conservation easement land holder was approached by a solar company that wanted to put a solar farm on the easement lands. It didn't work because of the amount of acreage suitable for the solar farm wasn't big enough for the company to build." Additionally, one respondent noted that they negotiated with a landowner to reduce the size of a solar farm on conserved land from 30 acres to 10 acres and another respondent reported a general objection to the "large" scale projects they had been witnessing of 20-60 acres in size.

Strategies Addressing Renewable Energy on Conserved Land

Overall, survey responses suggest that NYLTs are only beginning to adjust policies in response to renewable energy penetration into conserved open space. What's more, qualitative survey responses point to a lack of communication between NYLTs and the developers themselves. No land trust reported engaging directly with the renewable energy developers to help site renewable energy facilities yet several reported landowners of their

conservation easements have directly communicated with the developers. However, a few have reported involvement in municipal-level decision making. One respondent indicated that many towns in their service area have created moratoriums to grapple with zoning and other issues. Another land trust reported assisting the town write ordinances to protect scenic values.

Survey results further point to NYLTs taking renewable energy challenges in stride on a case-by-case or wait-and-see basis. In some cases land trusts have witnessed further proliferation in their region as one survey response stated:

> "Many new wind farms have been constructed in our service area in the last 10 years. Many community members and partner organizations have asked for us to advocate for or against wind farms, but the organization has not engaged. Solar farms are now being planned in our service area."

Responding to renewable energy siting challenges case-by-case has resulted in multiple interpretations of past easements. In those case-by-case decisions some NYLTs revert to a static conservation easement approach where past and future easements prohibit the siting of renewable energy on conserved land "for commercial purposes." No respondents mentioned amending easements as an approach to resolving renewable energy siting conflicts.

NYLTs also demonstrated elements of dynamic conservation easement models in their response to renewable energy siting conflicts. Common to many reported encounters with renewable energy development on conserved land, was the mention of building envelopes. Building envelopes are designated zones within a conservation easement subject to varying levels of restrictions. Restrictions of renewable energy, either explicitly defined as such or as accessory structures, were commonly reported as confined to a maximum percentage of the area outside of these building envelopes, usually around 2% of the total property. Multiple respondents reported farm areas commonly have this type of threshold as

a means of protecting the prime agricultural soils beneath. Draft easement language from one survey respondent illustrates the flexible yet ambiguous or subjective nature of such thresholds:

> Grantee's approval shall be granted only if Grantor demonstrates to Grantee that such improvements: (i) cannot reasonably be located within the Farmstead Complex or are better located in the Farm Area (for example, if such area offers a more efficient location for solar panels); (ii) will be located in a manner that minimizes impact on soils of prime or statewide importance and, to the maximum extent practicable, will not fragment viable agricultural lands; and (iii) will not diminish the Purposes of this Conservation Easement.

Such subjective clauses in draft conservation easement language were commonly observed in responses received in this survey. This offers both pros and cons. On the one hand, this builds in inherent flexibility for both the landowner and the land trust to meet common goals, while on the other hand enforcing such clauses can become subjective.

A case-by-case or wait-and-see approach stands in contrast to how NYLTs reported their likeliness of taking certain actions in response to anticipated climate impacts. Figure 10 displays the means and standard deviations for responses to a survey question requesting that respondents rate their likeliness to take a suite of pre-selected actions. On average, all actions were reported as "more likely" to occur in light of anticipated climate impacts. This may be a sign that a similar all-of-the-above response to renewable energy challenges could follow if land trusts do in fact respond to climate and energy threats in a similar manner. Implementing an all-of-the-above strategy could be compromised by lack of organizational capacity to add or alter programs. This survey was not able to confirm a statistical correlation between the likelihood of taking climate actions and supporting the adoption of clean energy. Additionally, the survey responses were recorded as predictions of the future and do not represent actual outcomes or current actions taken.

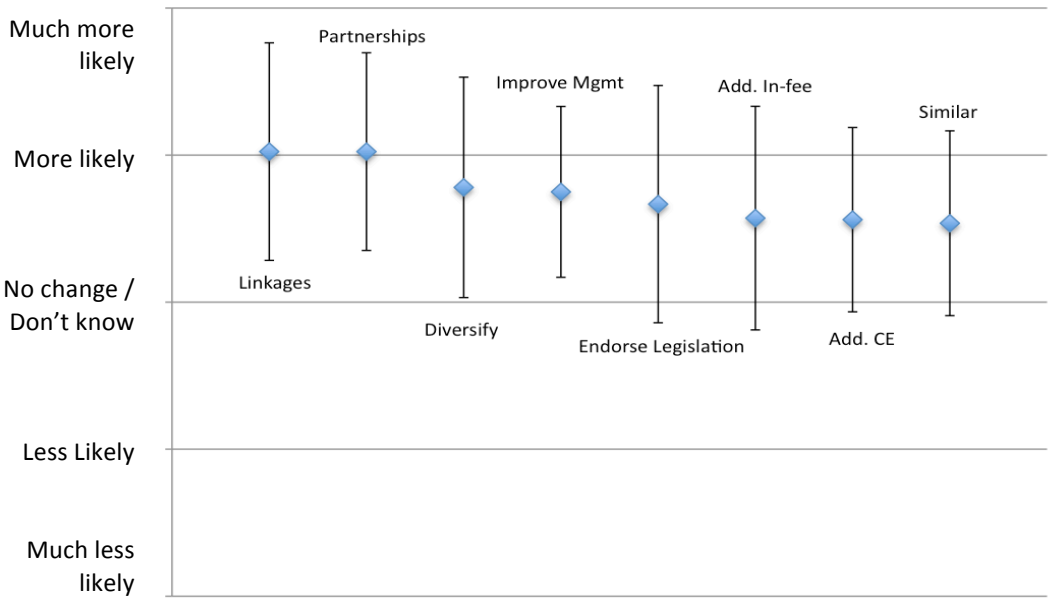

Figure 10: Likelihood of conservation actions in response to anticipated climate impacts. Error bars display +/- 1 standard deviation about the mean. Labels: Linkages=Linking conserved properties to create movement corridors; Partnerships=Forming conservation partnerships; Diversify=Conserve areas of different ecosystem type; Improve Mgmt=Improving management and restoration of existing protected areas; Endorse Legislation=Endorsing legislation that would mitigate climate change; Add. In-Fee=Pursue additional in-fee acquisitions of land; Add. CE=Accepting/purchasing additional conservation easements; Similar=Conserve areas of similar ecosystem type to that already conserved.

Many respondents acknowledged a present effort to revise easement language including one land trust which received a grant to help develop criteria for evaluating current and potential fee-owned lands for renewable energy potential. The grant will also allow the land trust to adapt their conservation easement language to responsibly accommodate renewable energy structures. One example of renewable energy integration into conservation easements includes the use of building envelopes. As one respondent shared from some draft easement language, "Within designated Farmstead Areas and a designated Rural Enterprise Area, Grantor may construct [Alternative Energy and Communications Structures and Improvements] without permission of Grantee." Akin to the homestead areas with little to no

building restrictions, rural enterprise areas allow conservation easement holders a designated area of their property to use their land commercially for purposes that do not directly interfere with the purposes of the easement. Easements where rural enterprise areas are already present have potentially facilitated renewable energy penetration and offer a potential solution for coexistence in future easements. Such rural enterprise areas are another example of a dynamic structure, allowing land holders to change the use of a piece of their land over time, which stands in contrast to the static "no commercial use" clauses found in other easements.

There is a growing awareness from many survey participants that they feel a need or desire to work on better language for future easements to responsibly accommodate renewable energy. Eighty-four percent of survey respondents indentified that having guidance in incorporating climate into strategic planning would be a helpful resource to develop policies around climate and energy. Moreover, 79%, 63% and 58% indicated that they were in need of dedicated staff time or personnel, technical assistance making use of climate data, and guidance managing their fee lands, respectively. Another 53% indicated a desire for guidance understanding policy/market drivers as well as guidance crafting easement language around climate and energy. The survey found that decision-support tools and mapping/GIS expertise were of least demand, yet not inconsequential, with 42% and 39% of respondents identifying those choices, respectively.

Overall, NYLT response to renewable energy siting challenges has been tempered but with some signs of proactive planning. Where engaged, NYLTs have approached renewable energy siting challenges from both a static (inflexible) and dynamic (flexible) conservation model. Elsewhere, nearly half of NYLTs have either not encountered the same challenges or

are seemingly taking a wait-and-see approach. The next chapter argues why a wait-and-see or a case-by-case approach is risky to both the goals of the Alliance's Climate Change Initiative and to the land trusts themselves. The next chapter will also explore several opportunities for land trusts created by emerging climate and energy challenges and issue policy recommendations to the Alliance, New York's land trusts, and NY State Environmental Organizations & Regulators in order to capitalize on these opportunities.

Policy Recommendations

Overview of Recommendations

From a survey of New York's land trust community, this report identifies five focal areas for further consideration as a first step to guiding the Alliance's pilot programming associated with the Climate Change Initiative. These include: mission alignment, awareness and information flows, strategic planning, siting utility scale wind and solar, and easements and fee-lands. These focal areas present NYLTs with an opportunity to boost relevancy and/or visibility through engaging more deeply in a set of broader policy goals for New York State around climate and energy. However, NYLTs' adoption of climate and energy issues into organizational practice has been thus far been slow. This section summarizes these focal areas and presents policy recommendations to the Land Trust Alliance, renewable energy developers, New York's land trusts, and/or New York state agencies. Lastly, the report concludes with general conclusions for an integrated renewable energy and open space vision and offers direction for future inquiry.

Mission Alignment

A lack of perceived mission alignment with climate and energy objectives may be contributing to the wait-and-see approach observed in the survey. Survey results indicated that organizations with the greatest concern for climate change and with missions that more closely align with climate and energy goals have been the earliest to take steps towards forming policies around climate and energy. As the Alliance develops its own policies around climate and energy connected with the climate change initiative, land trusts have an

opportunity to engage with their communities to develop policies around climate and energy that are in line with their mission.

Mission statements are highly subjective and, depending on the organization, can center on specific goals such as scenic enjoyment or preserving water quality to more encompassing values around ecological health. Stein and O'Boyle (2017) posit that in order for land trusts to be open to site renewables on fee-lands, land trusts may have to expand their mission from pristine stewardship to include more integrative conservation projects. Such a large shift may be seen as mission creep[8], yet any wait-and-see approach to engaging in climate and energy issues potentially increases the risk of rising costs to retro-actively confront these issues. Further analysis around mission alignment may be necessary to find ways to effectively communicate land trust operations as part of the solution to climate change. For example, how have land trusts previously evaluated their mission statements in light of climate and energy?

Many land trusts reported the influence of invasive species, sea level rise, erosion, and extremes in precipitation as either influencing or strongly influencing the goal-setting and management of conserved lands. Such issues connect directly with some organizations' missions and could serve as drivers for action around climate change. Once an explicit connection between the organization's mission and climate change is established, there may be sufficient basis for discussion around the need to transform New York's energy system and the role of land trusts in meeting that end. Ultimately this connection will also need to be made explicit to land trust supporters as well, or risk dividing the organization's support base, as the next section will explore in more detail.

[8] Mission creep refers to the gradual shift in objectives over the long-term that may result in an unplanned or unintended commitment.

Table 6: Mission alignment recommendations

Policy-Maker	Opportunity	Recommendation
Land Trust Alliance	• Inform NYLTs how their work is already addressing climate change to open a conversation about renewable energy	• Partner with state and national green energy, energy efficiency, and climate groups to explore areas of alignment with land trust missions • Communicate land trust operations in the context of a solution set to climate change
NYLTs	• Connect the land trust's mission to broader theme of climate change	• Consider how the land trust's mission and actions already contribute to climate change mitigation and adaptation • Evaluate mission statement in light of emergent climate change and renewable energy risks

Improving Awareness and Information Flows

Prior chapters illustrated how a lack of information can exacerbate pejorative and unconstructive dismissals of local concerns about a renewable energy project as being NIMBY. Van der Horst (2007) notes how opposition from local sources is most prevalent in the planning phases of siting facilities, when information about the project, its impacts, and its outcomes are unknown. Siting projects can have taken upwards of eight years (Stein & O'Boyle, 2017), a large cost for both the developers and their opponents. For that reason, there is a need for increased dialogue between renewable energy developers and land trusts to help steer projects away from sensitive lands and towards more locally appropriate ones. Land trusts have the potential to play a central role as brokers between developers and their opponents or as hosts to renewable energy projects.

The results point to a potential opportunity to further inform organizations engaged in advocacy, policy, and/or government relations of policy drivers and whether their mission supports the adoption of clean energy. Meanwhile, respondents reported that anticipated impacts from climate change would overall make them more likely to endorse legislation that would mitigate climate change (Figure 10). The Alliance's own climate website[9] is not

[9] http://climatechange.lta.org

particularly policy-focused. Further data and analytics of land trust interaction with this online resource could offer helpful insight to improving the effectiveness of the Alliance's information management around climate and energy.

Survey results point to a deficit of information before land trusts could appropriately weigh organizational policy towards hosting renewable energy facilities and some view wind and solar as negative reflections of their organization's mission. Setting climate and energy on land trusts agendas is therefore a first step to opening discussion for innovating around climate and energy challenges, as opposed to taking them on a case-by-case basis or avoiding those challenges altogether. Important to circumventing a wait-and-see or case-by-case response is the need to define what a successful renewable energy and land trust interaction might look like as a model for the benefits land trusts could realize from engaging in this issue. Furthermore, identifying leaders within land trusts' professional network who can bring climate and energy issues onto the organizations' agendas and broker information between peer groups will be important to keeping pace with the rate of energy sprawl occurring in the region.

Table 7: Awareness and information flows recommendations.

Policy-Maker	Opportunity	Recommendation
Land Trust Alliance	• Increase penetration of climate and energy topics into land trust discussions	• Bring policy drivers and renewable energy to the foreground of climatechange.lta.org • Use existing toolkit (e.g. regional workshops, webinars, climatechange.lta.org, circuit riders, working groups) to reinforce the benefits of getting involved in climate and energy issues • Present climate and energy topics in the context of current land trust practices • Define what a successful renewable energy and land trust interaction might look like and disseminate this vision through a case study or narrative
	• Advance the collective knowledge about private land conservation	• Partner with academic and independent research institutes to further study land trust operations and outcomes
NYLTs	• Increase organizational literacy about climate and energy issues	• Nominate or identify an individual within the organization to lead/integrate climate and energy efforts • Include climate and energy background in criteria for new hires
	• Contribute to more effective community engagement and transparency	• Solicit public input on climate and energy issues to reflect community values • Discuss whether broader policy trends in New York State and beyond that address climate change will be good/bad for conservation and, where appropriate, endorse/oppose legislation
Renewable Energy Developers	• Avoid potential local conflict	• Engage with local land trusts to act as information brokers to local communities, especially during planning phases when local objection is likely to be greatest.

Climate and Energy in Strategic Planning

New York's land trusts identified guidance incorporating climate and energy into strategic policy as the top need in order to effectively weigh organizational policy towards these issues. The Alliance currently has a section on their online learning platform where members can access resources to aid strategic planning. These resources do include discussion around climate change but less so about renewable energy development specifically. The diversity of land trusts missions, individual goals, and organizational capacity will require individualized services. The Alliance has previously used a circuit rider model, where specialized

consultants work one-on-one with land trusts to provide individualized support services, which may be an appropriate approach to help land trusts incorporate climate and energy into strategic planning.

Where changing legislation, legal rulings that alter easement language definitions, and the whims of the IRS are still wildcards (Doscher, 2010). Some land trusts are moving forward with internal renewable energy policies out of necessity on a case-by-case basis. Such an approach may create an inconsistent pattern in reacting to renewable energy challenges that could ultimately perpetuate a state of triage as impacts to conserved lands from climate change and renewable energy development increase. Additionally, a hard-line stance against renewable energy facilities could divide environmental supporters within a land trust's support base and risk losing relevancy or standing within their community. Therein lies the opportunity for land trusts to solicit community attitudes around climate and energy and communicate land trust operations as part of the solution to these salient issues.

There is a growing body of practitioner and academic literature addressing open space conservation challenges for an increasingly uncertain and competitive future that goes beyond the scope of this survey. Designing support services for land trusts as well as future evaluations on this subject could take advantage of a more focused look through a number of particularly useful frameworks cited in this report including those by Moser and Eckstrom (2010), the Open Space Institute (2016), the National Wildlife Federation (2014) or Zichella and Hladik (2013, p.10).

Table 8: Strategic planning recommendations.

Policy-Maker	Opportunity	Recommendation
Land Trust Alliance	• Facilitate climate and energy penetration into NYLT strategic plans • Provide personalized support services to NYLTs ○ Continue to develop an understanding of NYLT actions around climate and energy	• Continue to update strategic planning resources available on the Learning Center to reflect latest climate and energy research. • Deploy circuit riders with climate and energy expertise to work directly with land trusts to incorporate climate change and renewable energy into strategic plans ○ Continue to monitor land trust progress on their climate and energy awareness, literacy, and goals ○ Leverage recent and forthcoming frameworks and planning tools noted above to guide support services.
NYLTs	• Better plan for uncertain challenges or new opportunities with respect to climate and energy ○ Plan for the event that large-scale renewable energy facilities are proposed in your service area	• Utilize strategic planning resources available through the Land Trust Alliance Learning Center to review & update strategic plan in light of climate change and renewable energy. ○ Develop renewable energy siting criteria that would be consistent with the organization's mission and conservation goals.
NY State Agencies	• Balance policy objectives across state agencies	• Review plans such as the NY Open Space Conservation plan to better account for renewable energy's impacts to protected private land.

Engaging Land Trusts in Siting Utility-Scale Wind and Solar

New York's land trusts have indicated that the size of the renewable energy facility is a principle concern to weighing organizational policy. At the same time, many have allowed for small, distributed systems on their easement land. Land trusts may therefore already be equipped to handle more distributed energy systems than large or utility-scale facilities. In response to the moratoriums that are spreading amongst New York's municipalities, land trusts can have an important role to play as both a representative of the local community and as specialists in land use. Land trusts with utility-scale projects proposed in their areas should engage with municipalities and the NY Public Service Commission to offer expertise in steering projects towards least-impact lands. New York recently revised their regulatory

framework under Article 10[10] for electricity generating facilities over 25 megawatts, allowing for ad-hoc members of the siting board to come from municipalities and the creation of an intervenor fund. How this new regulatory regime will affect public commenting and land trusts' ability to weigh in on utility scale siting decisions remains unknown.

A lack of transparency in siting decisions—both on the part of renewable energy developers and the land trusts—exposes NYLTs to the risk of being viewed as NIMBY or otherwise as obstructionists. A perception that the organization is not acting in the public trust can result in losing funding, members, and volunteers over the long run (Atencio et al., 2013). Land trusts are thereby at risk of losing relevancy and an ability to continue their mission if perceived as NIMBY. On the other hand the same may be true if perceived as colluding with renewable energy interests, thus transparency in the siting process is key. The Alliance emphasizes that land trusts should practice transparency with each action that has public consequences in their standards & practices (LTA, 2017), however not all land trusts are accredited as upholding those standards. The issue of renewable energy siting presents an opportunity to strengthen the process by which land trusts engage with their constituents and/or form partnerships.

[10] http://www3.dps.ny.gov/W/PSCWeb.nsf/All/D12E078BF7A746FF85257A70004EF402

Table 9: Utility-scale wind and solar recommendations.

Policy-Maker	Outcomes	Recommendation
Land Trust Alliance	• Help land trusts facilitate the buildout of renewable energy in New York	• Issue guidance to NYLTs for engaging in Article 10 siting decisions • Issue guidance for interacting with utility-scale siting in the context of the Land Trust Standards & Practices
NYLTs	• Steer energy infrastructure away from sensitive or important lands	• Assist municipalities with planning and zoning rules to allow for appropriately sited renewable energy generation away from priority conservation lands. • Engage directly with solar and wind providers to explore partnerships that would facilitate smart-from-the-start renewable energy siting in New York
NY State Agencies	• Identify least-conflict areas to reduce siting conflict	• Engage directly with land trusts to hear concerns over local siting impacts • Communicate the reasoning behind siting decisions to land trusts whom can act as information brokers within the local community • Ensure incentive structure for utility-scale wind and solar facilities steer projects away from high conservation value open space and towards brownfields, landfills, former industrial sites, and other degraded lands

Renewable Energy Associated with Easements and Fee Lands

New York's land trusts reported conflicts between existing easements and renewable energy systems as well as challenges drafting new easement language to allow responsible siting of renewable energy. The literature tells us that static conservation easements, while less subjective, are not flexible to future socio-ecological changes in land use. Conservation easements that set dynamic restrictions (e.g. percentage thresholds or flexible building envelopes) can offer long-term solutions to landowner conflicts. This is true of renewable energy as well. As technology is inevitably bound to change and new disruptive technology emerges, easements should be wary of any static restrictions on commercial applications, generating capacity, or type of renewable energy. Moreover, easement language needs to be consistent with the latest scientific research. Where uncertainty in the scientific community

still exists, easements should be particularly careful not to set restrictions that could later be found erroneous.

Easement templates can serve as a starting point for land trusts to think of new easement guidelines in light of climate and energy. New York's Farmland Implementation Protection Grants include an easement template to begin negotiations between the landowner and the conservation organization. State agencies tasked with implementing REV, the Clean Energy Standard, and the siting of both distributed and utility-scale renewable energy can avoid future conflicts with conserved lands if able to work collaboratively to draft easement templates, particularly where any Clean Energy Fund grants are available to conservation groups. In an increasingly uncertain climate and energy landscape, flexibility in conservation easements will help prevent land trusts' protections from being found redundant or otherwise irrelevant in the future.

Not all land trusts may be prepared to take the risk of putting renewable energy on their fee-owned lands. Where would the infrastructure go and according to what principles? Leading land trusts in the state with greater capacity and the ability to take risks can therefore chart a course for others in New York and beyond. Demonstration projects, mapping-tools, and a process for evaluating present and future fee-owned properties could lead to what Stein and O'Boyle (2017) refer to as "integrated conservation projects." Projects like Witcomb Farm, mentioned earlier, could lead to new conservation finance models where properties with diminished conservation values could be made into profitable assets for landowners to keeps land in agricultural production. Moreover, this opens the door for land trusts to grow their revenues where renewable can be appropriately integrated into the conservation landscape. Similar work is common practice in many land trusts under a "working lands"

model where agricultural land is conserved and then leased to farmers on a contractual basis. In that sense, renewable energy systems can be part of a more financially stable conservation portfolio that is consistent with the organization's values.

Table 10: Easement and fee lands recommendations.

Policy-Maker	Opportunity	Recommendation
Land Trust Alliance	• Assist NYLTs evaluate conservation easement models in light of climate and energy challenges appropriate to their service area	• Leverage funds to allow NYLTs to evaluate renewable energy generating potential of fee-owned conservation land, strategic planning around climate and energy, or integrated conservation projects. • Develop guiding principles for siting projects on/near conserved land.
	○ Assist NYLTs evaluate fee-owned land in light of climate and energy challenges appropriate to their service area	○ Research and distribute model easement language that responsibly accommodates renewable energy, collaborating with State Energy Authorities and other relevant stakeholders. ○ Explore new conservation finance models including forest carbon credits and renewable energy leasing.
NYLTs	• Review existing easements in light of renewable energy to identify potential stewardship challenges	• Amend existing easements where necessary to clarify gaps created by distributed energy technologies.
	○ Refine an easement framework that will be useful in a changing energy landscape	○ Avoid static easement clauses that do not directly affect conservation values. ○ Consider more dynamic easement clauses that build in flexibility for unforeseen circumstances. ○ Ensure easements clauses are supported by scientific research.
	• Support broader efforts to fight climate change with land trust properties	• Increase attention paid to renewable energy criteria as part of the due-diligence process for land acquisitions • Consider small-scale demonstration projects to gauge community support.
NY State Agencies	• Improve REV initiative chance for success by engaging land conservation stakeholders	• Aid conservationists to develop new easement models that could accommodate both renewable energy and open space protection consistent with the policy objectives of REV.

Conclusion

Climate change impacts and renewable energy proliferation are mounting issues for New York's conservation community. Under REV, New York is preparing for an unprecedented expansion of wind and solar development, which raises important considerations for land-use planning and open space conservation. In order to meet both conservation goals and renewable energy mandates, New York's land trust community can play an important role to broker local conservation expertise and support for renewable energy projects. Renewable energy systems like wind and solar continue to present local siting challenges for land trusts and their communities, yet there is also great potential to apply land trusts' collective knowledge to creating the resilient communities of the future and improve conservation practice along the way.

From a survey of New York's land trusts, results suggest that this community is only beginning to grapple with this issue, and as a whole, have not set organizational policy to address growing climate and energy concerns. Yet, some land trusts also stand out as leaders within the group and may present important lessons for others. As the Land Trust Alliance and their partners implement the climate change initiative, this report can serve as a baseline for tracking project success. There is also a tremendous amount of information that can still be gleaned from the land trust community and from other states currently witnessing a boom in wind and solar production like California, Iowa, and Texas. This survey was limited in its depth, including both climate and energy together and targeted at the full spectrum of New York's diverse land trust community. The survey did not identify a direct correlation between concern for climate change and engagement on renewable energy. Nor did this survey test for overall climate and energy literacy amongst New York's land trusts.

To these ends, several questions remain. The Alliance can further inform their climate and energy initiatives through assessing the overall climate and energy literacy within the land trust community. Moreover, further analysis of the organizational culture within land trusts as either receptive to or weary of taking action on climate and energy could yield insight to inform support services. Deeper case studies of land trusts' decisions around renewable energy on and off conserved land as well as engagement with New York's siting procedures under Article 10 or directly with developers could yield additional interesting conclusions. In such a rapidly changing energy landscape, it is difficult to know whether land trusts may benefit from or be disadvantaged by a transition to renewable energy. At the same time, when the high water mark of New York's wave of renewable energy proliferation reveals itself, what implications will New York's land trusts leave for the future of land conservation?

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Appendix A: Survey Instrument

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Climate & Energy Survey - NY Land Trusts

Consent

Please read the following carefully. You will not be able to proceed to the survey without affirming consent.

Thank you for your willingness to participate in this Climate and Energy Survey. This research is being conducted by Collin Adkins, Master's candidate at the Bard Center for Environmental Policy, under advisement by Ethan Winter of the Land Trust Alliance's New York Program. The purpose of this study is to appraise the perceptions, attitudes, and policies within the land trust community in New York surrounding climate change and energy issues.

This survey should take approximately 30 minutes to complete. Please answer each question to the best of your ability. If you wish to skip a question you may do so without penalty. We suggest participants seek input from colleagues where necessary in order to represent the organization clearly and fairly. The deadline to complete the survey is January 15th, 2017.

This survey is designed to elicit your organization's position on issues related to climate and energy, which may carry some risk to the organization's public reputation. However, only the researcher will be able to identify the respondent. Individual organizations will not be identifiable in the final report. We suggest participants seek input from colleagues where necessary in order to represent the organization clearly and fairly.

The researcher wishes to make clear that no personally identifiable information will be made public in connection with survey responses. Access to data from this survey will be limited to the student researcher, academic advisors and the external advisor from the Land Trust Alliance. All electronic survey responses will be kept on private, password-protected computers. The original data may be combined for deeper analysis with Land Trust Alliance census data but will be erased once the data has been analyzed.

At the conclusion of this research, anticipated May 2017, a report will be issued to the Land Trust Alliance summarizing the findings of this survey, which will be publicly available through the Bard College library. Copies can be made available to participants upon request.

Any questions about the survey can be directed to the researcher and/or advisors at the phone number and email below:

Graduate Researcher:	Collin Adkins	ca2685@bard.edu
Faculty Advisor:	Monique Segarra	segarra@bard.edu
External Advisor:	Ethan Winter, Land Trust Alliance	ewinter@lta.org

For additional information regarding your rights as a participant in the survey, you can contact the Chair of the Institutional Review Board at Bard College at irb@bard.edu.

* 1. By checking the box below, I affirm my consent to participate and I acknowledge that I am 18 years of age or older. I am aware that my participation in this survey is voluntary and that I may choose to refrain from completing the survey without explanation. I understand the purpose and intent of this research and that my organization's participation will contribute to a graduate research project that will be shared with the Alliance to further inform services it provides to the land trust community.

☐ I have read and understand the above and affirm my consent to participate in the following survey.

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Climate & Energy Survey - NY Land Trusts

General Information

Thank you! Your responses are important to us.

2. Name of your organization:

3. What types of lands does your organization focus on protecting? (Select all that apply)

- [ ] Agriculture
- [ ] Wildlife Habitat
- [ ] Scenic Views
- [ ] Recreational
- [ ] Coastal
- [ ] Wetlands/Wetland buffers
- [ ] Riverside/Riparian
- [ ] Residential
- [ ] Cultural/Historic
- [ ] Working Forests
- [ ] Other (please specify)

4. Does your organization serve a predominantly urban, suburban, or rural community?

- ◯ Urban
- ◯ Mixed suburban and urban
- ◯ Suburban
- ◯ Mixed suburban and rural
- ◯ Rural
- ◯ Mix of urban, suburban, and rural

5. How big is the area you serve in New York?

- ◯ Single town
- ◯ Multiple towns
- ◯ County
- ◯ Multiple counties
- ◯ State-wide

6. Does your land trust's mission contribute to any of the following? (Select all that apply)

- ☐ Protecting water quality
- ☐ Protecting air quality
- ☐ Halting the loss of wildlife habitat
- ☐ Halting the loss of agricultural land
- ☐ Improving awareness of energy efficiency
- ☐ Improving awareness of climate impacts
- ☐ Protecting endangered species
- ☐ Protecting biodiversity
- ☐ Supporting the adoption of clean energy
- ☐ Climate change adaptation / Resiliency planning
- ☐ Climate mitigation / Offsetting carbon emissions
- ☐ Environmental Education

7. To what extent is each of the following considered when setting your organization's conservation goals?

	Not at all influences	Influences a little	Somewhat influences	Influences	Strongly influences	Unsure / Not applicable
Invasive species	○	○	○	○	○	○
Erosion/Flooding	○	○	○	○	○	○
Habitat value	○	○	○	○	○	○
Renewable energy potential	○	○	○	○	○	○
Carbon storage	○	○	○	○	○	○
Extreme weather events / Extreme temperatures	○	○	○	○	○	○
Seasonal shifts	○	○	○	○	○	○
Extremes in precipitation (droughts or floods)	○	○	○	○	○	○
Sea-level rise	○	○	○	○	○	○

8. How much does each of the following influence your organization's stewardship and management of easements and fee properties?

	Not at all influences	Influences a little	Somewhat influences	Influences	Strongly influences	Unsure / Not applicable
Invasive species	○	○	○	○	○	○
Erosion/flooding	○	○	○	○	○	○
Habitat value	○	○	○	○	○	○
Renewable energy potential	○	○	○	○	○	○
Carbon storage	○	○	○	○	○	○
Extreme weather events / Extreme temperatures	○	○	○	○	○	○
Seasonal shifts	○	○	○	○	○	○
Extremes in precipitation (droughts or floods)	○	○	○	○	○	○
Sea-level rise	○	○	○	○	○	○

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Climate & Energy Survey - NY Land Trusts

Organizational Practice

9. How frequently do you visit climatechange.lta.org?

- ◯ Often
- ◯ Somewhat often
- ◯ Not very often
- ◯ I've never visited climatechange.lta.org

10. Does your organization seek out information on any of the following ? (Select all that apply)

- ☐ Managing land for climate resiliency/adaptation
- ☐ Energy conservation/efficiency
- ☐ Renewable energy permitting processes
- ☐ Managing land for carbon storage
- ☐ Invasive species management
- ☐ Managing coastal areas, riparian corridors, or wetlands for climate change
- ☐ Pipeline or fracking news

11. Do you encounter difficulty in accessing information to any of the answers you have indicated above?

- ◯ Yes
- ◯ No
- ◯ N/A

12. Has the board/staff of your organization ever discussed the United States' commitment as part of the Paris Climate Accord to reduce greenhouse gas emissions by 28% from 2005 levels by 2025?

- ◯ Yes, often
- ◯ Yes, somewhat
- ◯ Not really / a little
- ◯ No
- ◯ Don't know

13. Has the board/staff of your organization ever discussed New York State energy policy? For example, Reforming the Energy Vision (REV), which includes New York's clean energy standard to have 50% of New York's power come from renewable energy by 2030 and Gov. Andrew Cuomo's plan to reduce New York's greenhouse gas emissions by 40% from 1990 levels.

- ◯ Yes, often
- ◯ Yes, somewhat
- ◯ Not really / a little
- ◯ No
- ◯ Don't know

14. Has your organization ever discussed if State (e.g. REV) and National (e.g. Paris Climate Accord) policies to reduce greenhouse gas emissions will be...

- ◯ Good for conservation (e.g. reducing the impact of climate change)
- ◯ Bad for conservation (e.g. added development pressure from renewable energy)
- ◯ Both good and bad for conservation
- ◯ None of the above, we have not discussed it

15. Does your organization involve itself in advocacy, policy or government relations at the state and/or federal level?

- ◯ Yes, very
- ◯ Yes, somewhat
- ◯ Not really / a little
- ◯ Not at all
- ◯ Don't know

16. Has your organization ever encountered a situation with renewable energy development in your service area?

- ◯ Yes
- ◯ No

17. If you answered yes to the question above, please elaborate on the circumstances, your experiences, and the outcome.

18. How would the existence of photovoltaic panels on your organization's conserved property reflect your organization's mission?

- ◯ Positively
- ◯ Negatively
- ◯ It offers both pros and cons
- ◯ It depends on the scale at which it is deployed

19. How would the existence of wind turbines on your organization's conserved properties reflect your organization's mission?

- ◯ Positively
- ◯ Negatively
- ◯ It offers both pros and cons
- ◯ It depends on the scale at which it is deployed

20. Are anticipated impacts from climate change making your organization more or less likely to take the following actions?

	Much less likely	Less likely	No change or Don't know	More likely	Much more likely
Pursue additional in-fee acquisitions of land	○	○	○	○	○
Accepting/purchasing additional conservation easements	○	○	○	○	○
Conserve areas of similar ecosystem type to that already conserved	○	○	○	○	○
Conserve areas of different ecosystem type (e.g. riparian zones, grassland, forests, wetlands, etc.)	○	○	○	○	○
Improving management and restoration of existing protected areas	○	○	○	○	○
Endorsing legislation that would mitigate climate change	○	○	○	○	○
Improving management and restoration of existing protected areas	○	○	○	○	○
Linking conserved properties to create movement corridors	○	○	○	○	○
Forming conservation partnerships	○	○	○	○	○

21. Does your organization monitor for impacts connected to climate change as part of its land stewardship efforts?

○ Yes

○ No

○ Don't know

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Climate & Energy Survey - NY Land Trusts

Plans and Policies

22. On a scale of 0 (not at all concerned) to 10 (greatly concerned), how concerned is your organization about the impacts of climate change to its commitment to perpetuity?

0 10

23. Does your land trust have a strategic conservation plan?

- Yes
- No
- We are in the process of developing our strategic conservation plan
- We are in the process of updating our strategic conservation plan

24. Does/will the strategic conservation plan address climate change?

- Yes
- No
- N/A

25. Does/will the strategic conservation plan address renewable energy?

- Yes
- No
- N/A

26. Does your land trust currently have any policies or conservation easement language (draft or approved) regarding renewable energy development on your conserved land (both fee-owned land and easements held)?

- ◯ Yes
- ◯ No, but we are currently working on drafting policies/easement language
- ◯ No
- ◯ Don't know / Not sure
- ◯ N/A

27. If you answered yes or that you are currently working on renewable energy policies and/or conservation easement language, would you be willing to share these as part of this survey is the space below?

28. Please rank the following factors from (10) least important to (1) most important information needed in order to appropriately weigh organizational policy towards solar energy on or near conserved land. (Drag or select ranking from dropdown to reorder)

- Amount of land required for the solar farm
- Impact to scenic views
- Impact on availability of farmland
- Impact on property values
- Impacts to wildlife
- Additional land conserved as mitigation
- Emissions offsets
- The type of land where it is sited (e.g. forest, grassland, ridgeline, etc.)
- Distance to properties owned/monitored by the land trust
- Public opinion of the land trust as either in favor or opposed to the project

29. Please rank the following factors from (10) least important to (1) most important information needed in order to appropriately weigh organizational policy towards wind energy on or near conserved land.

- Amount of land required for the wind farm
- Impact to scenic views
- Impact on availability of farmland
- Impact on property values
- Impacts to wildlife
- Additional land conserved as mitigation
- Emissions offsets
- The type of land where it is sited (e.g. forest, grassland, ridgeline, etc.)
- Distance to properties owned/monitored by the land trust
- Public opinion of the land trust as either in favor or opposed to the project

30. Does your organization have a staff or board member who is considered internally to be a leader on climate/renewable energy?

- ◯ Yes
- ◯ No

31. Does your land trust encourage its members/financial supporters to do any of the following? (Select all that apply)

- ☐ Reduce their carbon footprint
- ☐ Conserve energy
- ☐ Switch to clean energy
- ☐ Conserve water
- ☐ Plant trees
- ☐ Drive less / practice fuel efficiency
- ☐ Reduce agricultural greenhouse gas emissions

32. If you answered yes to any of the options int he question above, please specify how your land trust encourages people to take a particular action. (Select all that apply)

- [ ] Printed newsletter
- [ ] eNewsletter
- [ ] Website
- [ ] Social media
- [ ] Programs
- [ ] Special events
- [ ] Don't know
- [ ] Other (please specify)

33. What tools and resources would help guide your organization to develop policies around climate and energy? (Select all that apply)

- [ ] Mapping/GIS expertise
- [ ] Technical assistance (e.g. making use of climate data)
- [ ] Decision support tools
- [ ] Guidance on market/policy drivers
- [ ] Dedicated staff time, personnel
- [ ] Guidance for crafting easements
- [ ] Guidance for managing fee lands
- [ ] Guidance incorporating climate into strategic planning

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Climate & Energy Survey - NY Land Trusts

Debriefing Statement

Thank you for taking the time to complete the Climate and Energy Survey as part of my Master's capstone project. Your survey responses offer valuable insight into the practices, policies, and perceptions among the land trust community in New York with respect to climate change and energy issues. For more information regarding climate change and land conservation, you may visit climatechange.lta.org.

Any questions about the survey can be directed to the researcher and/or advisors at the phone number and email below:

Graduate Researcher:
Collin Adkins
cadkins@lta.org
(508) 471-0184

Faculty Advisor:
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Land Trust Alliance Advisor:
Ethan Winter
ewinter@lta.org
(518) 587-0774

For additional information regarding your rights as a participant of the Masters thesis, you can contact the Chair of the Institutional Review Board at Bard College: irb@bard.edu

Appendix B: Survey Data Summary

New York Land Trust Climate & Energy Survey Acronyms: NYLT- New York Land Trust; RE-Renewable Energy; CC-Climate Change			
General Information			
Survey invitations sent	86		
Survey Responses	42	49%	
Types of lands protected by NYLTs			
Wildlife Habitat	88%		
Recreational	83%		
Wetlands/ Wetland Buffers	83%		
Scenic Views	81%		
Riverside/ Riparian	69%		
Agriculture	64%		
Cultural/ Historic	52%		
Working Forests	43%		
Coastal	17%		
Residential	14%		
Other	2%	Municipal - Conservantion Easement	
	2%	Ecological	
	2%	Cliff and talus; geological resources	
	2%	special groundwater protection areas	
	2%	Urban Waterways & Former Industrial	
	2%	Community Gardens	
Urban-Rural gradient served by NYLTs			
Urban		5%	
Mixed suburban and urban		0%	
Suburban		5%	
Mixed suburban and rural		33%	
Rural		36%	
Mix of urban, suburban, and rural		21%	
Regional scope of NYLTs			
Single Town	7.14%		
Multiple Towns	21.43%		
County	19.05%		
Multiple Counties	50.00%		
State-wide	2.38%		
Percent of NYLTs with missions contributing to the following:			
Protecting water quality			88%
Halting the loss of wildlife habitat			86%
Protecting biodiversity			81%
Environmental education			79%
Protecting endangered species			64%
Halting the loss of agricultural land			57%
Protecting air Quality			52%
Climate change adaptation / Resiliency planning			50%
Improving awareness of climate impacts			48%

Climate mitigaiton / Offsetting carbon emissions	21%
Supporting the adoption of clean energy	14%
Improving awareness of energy efficiency	12%

Organizational Practice

Densities of reported influence to goal setting and property management from nine climate and energy factors

	Setting organization's conservation goals				
	Not at all influences	Influences a little	Somewhat influences	Influences	Strongly influences
Invasive Species	0.05	0.15	0.27	0.34	0.20
Erosion/Flooding	0.12	0.17	0.17	0.44	0.10
Habitat value	0.00	0.02	0.00	0.17	0.80
Renewable energy potential	0.51	0.30	0.16	0.03	0.00
Carbon storage	0.33	0.38	0.15	0.10	0.03
Extreme weather events / Extreme temperatures	0.30	0.33	0.18	0.18	0.03
Seasonal shifts	0.19	0.32	0.22	0.22	0.05
Extremes in precipitation (droughts or floods)	0.18	0.25	0.20	0.20	0.18
Sea-level rise	0.64	0.17	0.08	0.03	0.08

	Stewardship and management of easements and fee properties				
	Not at all influences	Influences a little	Somewhat influences	Influences	Strongly influences
Invasive Species	0.00	0.14	0.17	0.29	0.40
Erosion/Flooding	0.07	0.22	0.22	0.32	0.17
Habitat value	0.02	0.02	0.05	0.27	0.63
Renewable energy potential	0.45	0.32	0.18	0.03	0.03
Carbon storage	0.41	0.28	0.18	0.08	0.05

Extreme weather events / Extreme temperatures	0.32	0.24	0.34	0.03	0.08
Seasonal shifts	0.22	0.42	0.22	0.11	0.03
Extremes in precipitation (droughts or floods)	0.23	0.28	0.25	0.13	0.13
Sea-level rise	0.65	0.24	0.00	0.06	0.06

Spearman Comparison of Goal-Setting and Stewardship Priorities

Variable	n	rho	p
Invasive Species	41	0.8059	0.0000
Erosion/Flooding	41	0.8397	0.0000
Habitat value	41	0.5216	0.0005
Renewable energy potential	36	0.7744	0.0000
Carbon storage	39	0.9013	0.0000
Extreme weather events / Extreme temperatures	38	0.6921	0.0000
Seasonal shifts	36	0.8488	0.0000
Extremes in precipitation (droughts or floods)	40	0.7326	0.0000
Sea-level rise	34	0.9276	0.0000

Null hypothesis: variable for goal-setting and stewardship are independent.

NYLT visits to climatechange.lta.org

I've never visited climatechange.lta.org	43%
Not very often	48%
Somewhat often	7%
Often	2%

Percent of NYLTs seeking information on:

Invasive species management	93%
Managing land for climate resiliency/adaptation	74%
Managing coastal areas, riparian corridors, or wetlands for climate change	50%
Pipeline or fracking news	40%
Energy conservation/efficiency	31%
Managing land for carbon storage	31%
Renewable energy permitting processes	19%
Percentage reporting difficulty in accessing above information	21%

Percent of NYLTs that have discussed policy drivers internally and their perceived outcomes:

	Paris Climate Accord	Reforming the Energy Vision	Perceived Outcome
No	57%	55%	-

Not really / a little	26%	19%	-	
Yes, somewhat	17%	21%	-	
Yes, often	0%	5%	-	
We have not discussed it	-	-		64%
Bad for conservation	-	-		0%
Both good and bad for conservation	-	-		21%
Good for conservation	-	-		14%

Percent of NYLT involved in advocacy, policy or government relations at the State and/or Federal level:

Not at all	21.4%
Not really / a little	19.0%
Yes, somewhat	50.0%
Yes, often	9.5%

Percent of NYLTs that have encountered RE development in their service area:

Yes	50%
No	50%

Presence of solar and wind technology on conserved land would reflect organization's mission:

	Solar	Wind
Negatively	16.67%	28.57%
It offers both pros and cons	26.19%	35.71%
It depends on the scale at which it's deployed	42.86%	33.33%
Positively	14.29%	2.38%

Densities of likelihood to proposed actions as a result of climate change impacts:

	Much less likely	Less likely	No change or Don't know	More likely	Much more likely
Linking conserved properties to create movement corridors	0.00	0.02	0.52	0.31	0.14
Forming conservation partnerships	0.00	0.00	0.51	0.41	0.07
Conserve areas of different ecosystem type (e.g. riparian zones, grassland, forests, wetlands, etc.)	0.00	0.00	0.54	0.39	0.07

Improving management and restoration of existing protected areas	0.00	0.02	0.34	0.46	0.17
Endorsing legislation that would mitigate climate change	0.02	0.00	0.40	0.43	0.14
Pursue additional in-fee acquisitions of land	0.00	0.00	0.40	0.45	0.15
Accepting/purchasing additional conservation easements	0.00	0.02	0.19	0.52	0.26
Conserve areas of similar ecosystem type to that already conserved	0.00	0.00	0.21	0.55	0.24

Percent of NYLTs reporting climate impacts included in stewardship/monitoring:

Don't Know	5%
No	64%
Yes	31%

Plans and Policies

Degree of concern about climate change to NYLTs commitment to perpetuity:

Scale: 0-Not at all concerned to 10-Greatly concerned, reported in density by rank

Rank	Density
0	7.1%
1	4.8%
2	4.8%
3	2.4%
4	0.0%
5	9.5%
6	7.1%
7	21.4%
8	19.0%

9	11.9%
10	11.9%
MEAN	6.40
STDEV	2.94

NYLTs with strategic conservation plans that address climate and/or RE:

	Strategic Plan	CC	RE
No	12%	0%	0%
We are in the process of developing our strategic conservation plan	17%	12%	5%
Yes	60%	24%	5%
We are in the process of updating our strategic conservation plan	12%	10%	7%
SUM	100%	45%	17%

NYLTs reporting current policies or conservation easement language regarding RE development on conserved land:

Don't know / Not sure	2%
No	50%
No, but we are currently working on drafting policies/easement language	14%
Yes	33%

Ranked priority information need to weigh organizational policy towards wind & solar on/near conserved land:

Scale: 1-Most important, 10-Least Important

	Solar-avg	Solar-stdev	Wind-avg	Wind-stdev
Wildlife Impacts	2.61	2.38	2.58	2.27
Type of land where RE is sited	3.26	2.77	4.11	1.88
Scenic Impacts	4.28	2.94	2.78	3.00
Public Opinion	5.13	2.61	5.91	2.91
Size (Land Area)	5.14	1.85	5.06	2.19
Farmland Availability	5.77	2.07	6.15	2.20
Mitigation	6.38	2.36	6.42	2.31
Distance to Conserved Land	6.97	2.20	6.17	2.35
Emissions Offsets	7.29	2.22	7.46	2.42
Property Values	7.79	2.66	7.51	2.29

Spearman Comparison of Wind and Solar Rankings

Variable		n	rho	p
size	Size (Land Area)	35	0.4483	0.0069
scenic	Scenic Impact	35	0.5661	0.0004
farm	Farmland Availability	33	0.7236	0.0000
propval	Property Values	33	0.7501	0.0000
wildlife	Wildlife Impacts	32	0.8171	0.0000
mit	Mitigation	33	0.7030	0.0000
offset	Emissions Offsets	32	0.6732	0.0000
type	Land Type	33	0.7667	0.0000
dist	Distance to Conserved Land	32	0.7968	0.0000
opinion	Public Opinion	30	0.4710	0.0086

Null hypothesis: variable for wind and solar are independent.

Density Distributions

Solar	1	2	3	4	5
wildlife	0.42	0.15	0.09	0.21	0.03
type	0.14	0.31	0.29	0.03	0.11
scenic	0.19	0.08	0.17	0.19	0.11
opinion	0.10	0.13	0.13	0.03	0.16
size	0.08	0.03	0.17	0.14	0.11
farm	0.06	0.14	0.09	0.11	0.06
mit	0.00	0.09	0.00	0.03	0.18
dist	0.00	0.03	0.03	0.06	0.18
offset	0.03	0.03	0.03	0.03	0.12
propval	0.03	0.03	0.03	0.09	0.03

contued…	6	7	8	9	10
wildlife	0.06	0.00	0.03	0.00	0.00
type	0.03	0.00	0.03	0.03	0.03
scenic	0.03	0.06	0.06	0.03	0.08
opinion	0.03	0.23	0.06	0.13	0.00
size	0.25	0.03	0.08	0.08	0.03
farm	0.09	0.09	0.11	0.17	0.09
mit	0.24	0.21	0.12	0.06	0.09
dist	0.12	0.18	0.15	0.06	0.21
offset	0.03	0.18	0.18	0.24	0.15
propval	0.03	0.06	0.18	0.18	0.35

Wind	1	2	3	4	5
wildlife	0.39	0.27	0.12	0.06	0.09
type	0.11	0.17	0.17	0.14	0.17
scenic	0.28	0.28	0.19	0.08	0.08
opinion	0.03	0.06	0.09	0.09	0.17
size	0.06	0.06	0.17	0.17	0.09
farm	0.06	0.06	0.09	0.21	0.06
mit	0.00	0.08	0.06	0.00	0.17
dist	0.06	0.00	0.08	0.14	0.11
offset	0.03	0.03	0.00	0.00	0.14
propval	0.06	0.06	0.03	0.09	0.00

continued…	6	7	8	9	10
wildlife	0.00	0.00	0.00	0.03	0.03
type	0.09	0.06	0.00	0.06	0.03
scenic	0.03	0.03	0.00	0.03	0.00
opinion	0.14	0.14	0.14	0.11	0.03
size	0.17	0.17	0.03	0.06	0.03
farm	0.03	0.09	0.12	0.09	0.21
mit	0.17	0.22	0.14	0.08	0.08
dist	0.14	0.11	0.17	0.14	0.06
offset	0.14	0.09	0.17	0.17	0.23
propval	0.03	0.00	0.26	0.17	0.31

Percent of NYLTs with a staff or board member who is considered internally to be a leader on climate/renewable energy:

Yes	27%
No	73%

Percent of NYLTs that encourage members/financial supporters to take the following actions:

Plant trees	64%
Conserve water	40%
Reduce their carbon footprint	33%
Conserve energy	29%
Switch to clean energy	17%
Drive less / practice fuel efficiency	14%
Reduce agricultural greenhouse gas emissions	2%

How NYLTs reported they encouraged their members/financial supporters:

Social media	50.00%	
eNewsletter	47.62%	
Programs	42.86%	
Printed newsletter	38.10%	
Website	35.71%	
Special events	35.71%	
Don't know	2.38%	
Other	2.38%	landscaping technical assistance
	2.38%	[A-House] tours*
	2.38%	Presentations to 5th grade class *

** Indicates responses that were changed either to protect anonymity or for brevity*

Tools and resources identified to help guide NYLTs to develop policies around CC and RE:

Guidance incorporating climate into strategic planning	84%
Dedicated staff time, personnel	79%
Technical assistance (e.g. making use of climate data)	63%
Guidance for managing fee lands	58%
Guidance on market/policy drivers	53%
Guidance for crafting easements	53%
Decision support tools	42%
Mapping/GIS expertise	39%