



UNIVERSITY OF ICELAND

Master's Thesis
In Environment and Natural Resources

Clean energy advocacy in Pennsylvania:
Strategy insights from selected nonprofits

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Supervisor: Steinunn Hrafnisdóttir, Professor

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Faculty of Social Work

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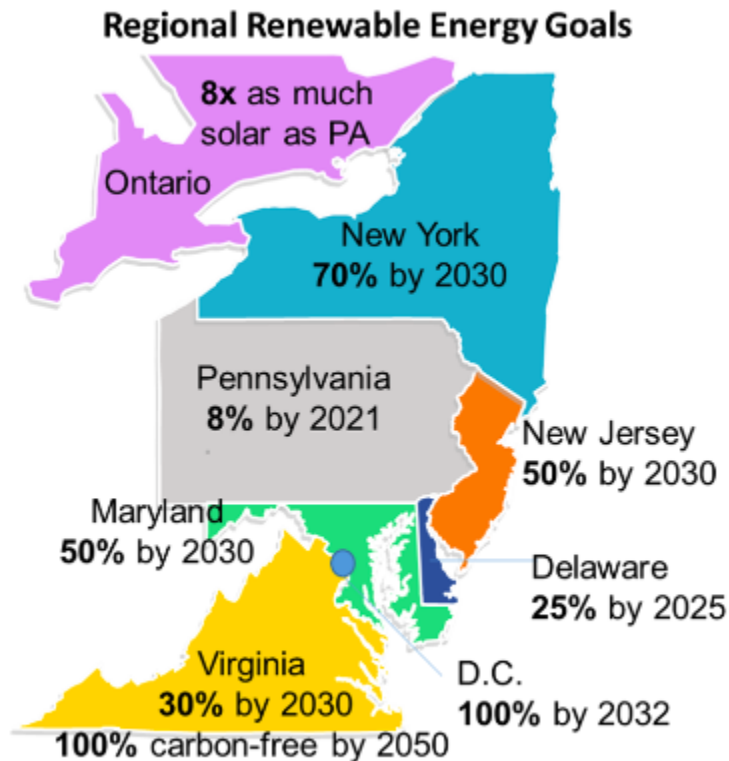
Preface

This master's thesis is a collaboration between the Faculty of Social Work and the Environment and Natural Resources program at the University of Iceland. The thesis includes a literature review and qualitative interview analysis. In the literature review, the importance of and views of clean energy are discussed, as is the role of environmental nonprofits in advancing this important solution to climate change. Nonprofit advocacy has been presented as an important asset in filling gaps in governmental provision of a public good: renewable energy that replaces the carbon dioxide emitting fossil fuels that comprise the current energy landscape. To identify how and why nonprofit professionals work to improve clean energy policy in the Commonwealth of Pennsylvania, 12 interviews were conducted and analyzed. The results are presented and followed with a discussion of recommendations.

I chose this research topic because of my past intern experiences for the Pennsylvania-based environmental nonprofit PennFuture and for the Sierra Club, which sparked my curiosity in *how* nonprofits successfully advocate for environmental policies, specifically related to clean energy. Upon my return to the US after a semester abroad in Iceland, I was even more aware of the stark differences in clean energy acceptance and policies between the two countries. With Pennsylvania's extremely extractive history of reliance on hydraulic fracking, consequential socio-environmental damages and injustices compose the status quo (Healy et al., 2019). Notably, Pennsylvania's inadequate renewable energy policy is the major driver for its continued reliance on fossil fuels. In fact, Pennsylvania was one of the top five solar-producing states in 2010 but has fallen to 22nd in this list as of 2023. Since 2010, the cost of solar energy has decreased by 70% (SEIA, 2022). The issue, as shown in Figure 1, is that Pennsylvania's renewable targets are far behind those of its neighboring states, which are closer to what is necessary to combat climate change according to the PA Solar Center (2023). I have learned from environmental nonprofit organizations that are actively working to realize a clean energy future through various advocacy efforts. Therefore, I chose the subject of my research to gain insight into the role and strategies of nonprofits in advancing sustainable energy. This work is important because not only do gaps exist in the literature about Pennsylvania's need for renewable energy, but additional information is also needed concerning the role of various nonprofits' advocacy strategies in nonprofits, as well as how nonprofit advocacy engagements

affect society (Guo et al., 2013). Ultimately, I hope that my findings — an analysis of successful environmental advocacy techniques — will strengthen the efforts of other nonprofit organizations working to address climate change.

Figure 1: Renewable energy goals of states in the mid-Atlantic region and Ontario.



(PA Solar Center, 2023).

Abstract

Reliance on extractive, polluting energy sources is one of the largest contributors to climate change and a barrier to the realization of a sustainable future. Energy powers a massive number of activities in the United States; thus, decisions regarding future energy sources will characterize the trajectory of global warming. In the state of Pennsylvania, the transition to clean energy—namely, solar, wind, and hydropower—is a slow process facing greater resistance than in its neighboring states. To combat challenges such as political tension and a status quo of harnessing fossil fuel power, environmental nonprofits have a long and ongoing history of advocacy for clean energy. The aim of this thesis is to examine which advocacy strategies environmental professionals have considered effective in increasing support for renewable energy investment and widespread use. Through a literature review and qualitative interviews with 12 professionals working at Pennsylvania environmental nonprofits, this study identifies recommendations for overcoming obstacles to the growth of clean energy. Interview analysis and coding revealed that environmental advocates advise using strategic messaging, building relationships with affected communities and relevant stakeholders, engaging in coalitions, taking advantage of clean energy funding and resources, and lobbying for environmental policies as well as electing supportive legislators. This qualitative research in Pennsylvania demonstrates that tactical methodology and consideration of psychological factors can increase effectiveness of clean energy advocacy. Most significantly, the results of this study can assist environmental advocates in overcoming barriers to clean energy acceptance and ultimately, advancing widespread renewable energy use in Pennsylvania.

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Introduction

Background

Recent history has demonstrated that environmental issues and contemporary human activity are closely linked. The Anthropocene—a geological time period during which human activities have had a significant effect on Earth and atmospheric systems—demands a better understanding of why and how to create consensus for and commitment to solving environmental problems (Newell et al., 2014). Environmental laws have been implemented to limit the myriad anthropogenic impacts such as regulations protecting endangered species and clean air standards in the United States. However, when the federal government and/or state governments ineffectively or incompletely address problems or enforce such rules, nonprofits may become involved (Grant and Grooms, 2017). The current environmental crisis, characterized by climate change, air pollution, habitat loss, and many other issues, stems from a social dilemma in which public goods are insufficiently provided. Many environmental public goods are undersupplied, including investments in clean energy and conservation of resources such as water and rainforests (Hardin, 1968; Newell et al., 2014). Nonprofits often seek to fill the gap left by government and individual self-interest in supplying public goods through activities such as informing the public, assisting with monitoring and enforcement, lobbying, and public mobilization (Grant and Grooms, 2017).

The provision of clean energy, through policies, investment, and public education, offers a critical solution to help mitigate climate change. Through the replacement of fossil fuels with renewable energy, emissions of atmosphere-warming carbon dioxide will lessen (Moorthy et al., 2019). Yet acceptance of renewable energy sources and technologies, such as solar, wind, and biomass, remains low in some places and project implementation is limited (Bayulgen and Benegal, 2019). Changing Americans' views on clean energy is challenging in part due to deeply embedded beliefs in prioritizing personal needs and industrial growth over environmental protection (Sovacool, 2009), and in part due to identification with groups opposed to environmental protection. The US remains one of the highest emitters of greenhouse gasses in the world, partially due to profitable natural gas and oil reserves (Hazboun and Boudet, 2020; EIA, 2023). Pennsylvania, a state in the Eastern US, is a leading exporter of fossil fuels,

especially natural gas (EIA, 2023). The state's extractive history and political shifts (Frey and Teixeira, 2008) explain its extensive policies promoting fossil fuels. However, Pennsylvania has numerous environmental nonprofits working to change this situation by advocating for clean energy and stronger renewable energy policies. This study examines the opinions of experienced clean energy advocates regarding most effective methodology through a literature review and qualitative interviews.

The goals of this research are to identify those strategies that may be most beneficial in successful environmental advocacy and recognize challenges to effective advocacy in a state as politically contentious as Pennsylvania. The literature review informs these interviews and situates the findings within the much larger body of work on the role of nonprofits in advocacy. Through interviewing experienced professionals in the environmental field, trends and common best practices have been identified and analyzed. Ultimately, the objective of this research is to provide recommendations of successful environmental advocacy techniques, which could strengthen the efforts of other nonprofit organizations.

Research problem and question

In response to the growing urgency of climate change and insufficient speed of renewable energy adoption, this research examines the strategies utilized by environmental nonprofits in Pennsylvania. The aim of this study is to contribute to the current literature on the role and tactics of nonprofits in advocacy, specifically their role in promoting clean energy. This thesis will draw upon expertise of clean energy and clean air professionals working in Pennsylvania-based environmental nonprofit organizations. Through an analysis of the literature review and their responses, this study will identify effective advocacy strategies as well as recommendations for overcoming common barriers to clean energy advocacy and deployment. The term “effective” is used subjectively in this research, because its definition is determined by each interviewee's experiences. In other words, those certain strategies that have led to successful results (e.g. lobbying methods that have helped a renewable energy policy pass in the legislature or messaging techniques that have piqued a conservative stakeholder's interest) will be identified by each participant as “effective.”

The research questions are as follows:

- What are the most effective strategies in clean energy advocacy used by environmental nonprofits in Pennsylvania, in the experience of interviewed professionals?
- What challenges do nonprofits face in clean energy advocacy, and what tools can be used to overcome them?
- What recommendations do experienced professionals have for others working to advance clean energy?

Scope and limitations of study

The qualitative data analysis carried out in this study involved coding and evaluating messages conveyed in 12 semi-structured interviews with environmental nonprofit professionals. This work was conducted over a period of five months and carried out by the author. Limitations of the study include the number of interviews (12), number of nonprofits involved in the study (11), geographical focus on Pennsylvania, and limited research time. In the future, this research could be built upon by extending the study area, interviewing a broader array of representatives from additional nonprofits, and examining other issue areas in addition to clean energy advocacy.

Literature Review

The importance of clean energy

The world's population is and has been growing at an exponential rate, having reached 8 billion people in 2022 (World Population Review, "2023 World population," 2023). Consequently, the global energy demand has dramatically increased and is being met primarily through conventional fossil fuels—coal, oil, and natural gas—that produce both heat energy and carbon dioxide. A greenhouse gas that is largely responsible for global warming, carbon dioxide (CO₂)-emitting energy sources are unsustainable (Moorthy et al., 2019). Already, the world has warmed by 1.2°C from preindustrial temperatures (Leiserowitz et al., 2019). There is growing support from the global science and policymaking community that an energy transition from fossil fuels to renewable energy is urgently needed, yet implementation of these projects and policies remain slow (Bayulgen and Benegal, 2019). Types of renewable energy that would minimize continued climate change include solar, wind, biomass, and hydropower energy sources (Mitrašinović, 2021). Policy and regulatory frameworks, including those that provide improvements to technology and energy infrastructure, must be adopted on an international and state-wide level to minimize carbon dioxide emissions and sufficiently mitigate climate change (Gielen et al., 2019). Without swift action, climate change will continue causing increasingly devastating impacts on human health and the environment.

The US in particular continues to face challenges in energy production; fossil fuel extraction technologies have been improved, and oil and natural gas reserves are still more inexpensive than renewable sources (Hazboun and Boudet, 2020). As the second-largest carbon emitter in the world, the US has vast potential to alter the course of climate change; yet, fossil fuel production remains at an all-time high (World Population Review, "Carbon footprint," 2023; EIA, 2023). Although coal is declining in the US due to costly plant repairs and diminishing resources, natural gas power plants are still increasing (Hazboun and Boudet, 2020). The Energy Information Administration (EIA) projects that the US will be a net producer and exporter of both petroleum and natural gas through 2050 in all considered cases; although, renewable energy generated electricity is also expected to grow in all regions of the country (2023). However, the predicted consequential decline in US CO₂-related emissions (25%—38% below the 2005 level

by 2030) is inadequate to achieve its Paris Agreement Nationally Determined Contribution (NDC), the US' CO₂ emissions must drop by 50% to 52% by 2030 (EIA, 2023).

Pennsylvania, specifically, has an extractive history due to its ample coal and natural gas reserves, which are primarily found in the Marcellus Shale region. Recent pipeline projects have expanded the reach of the Marcellus natural gas market, and increased underground natural gas storage facilities serve the state's winter heating needs. Furthermore, Pennsylvania has a 200-year history of coal mining and ranks third of the coal-producing states. With continued reliance on these subsidized underground resources, Pennsylvania has not harnessed its renewable energy potential. Only three percent of the state's electricity was produced from renewable sources in 2021, mostly comprised of wind and solar. While this amount of renewable energy production surpassed its alternative energy portfolio standard (AEPS) of 18% by 2021, "alternative energy" includes polluting sources such as waste coal. Solar was required to generate 0.5% of the state's electricity (EIA, 2022). The state's industrial past is cited as critical for economic prosperity and high population. At its zenith in 1970, PA ranked third in population size, after New York and California (Frey and Teixeira, 2008).

Clearly, Pennsylvania is a prime example of the lack of action on climate change that is evident on a global level. Since the 2015 Paris Agreement, when a coalition of countries agreed to take action to limit global warming to "well below 2°C," all nations have failed to meet their climate commitments, and the five hottest years have been recorded (Leiserowitz et al., 2019). Although the COVID-19 pandemic's devastation of the world economy reduced fossil fuel use, emissions will rise again without significant action to shift toward a clean energy future (Mohideen et al., 2021). Measures taken to move forward from the pandemic and to mitigate worsening health-related climate impacts are closely related and must be taken with care (Leiserowitz et al., 2019).

Air pollution, largely driven by the burning of fossil fuel for energy production, is considered the most critical threat to both the environment and human health; according to the World Health Organization, air pollution kills approximately seven million people per year (WHO, 2022). About one million deaths annually are linked to air pollution from coal-fired energy, 390,000 of which were in 2018 due to particulate pollution (Leiserowitz et al., 2019). Other climate impacts on human health include the harm caused by more frequent extreme weather events, such as heat waves, wildfires, floods, droughts, and hurricanes, as well as an

increase in the frequency of vector-borne diseases, lessened crop yields, and food and water contamination (Watts et al., 2021; Maibach et al., 2021). Adverse social effects of climate change include political unrest and climate-related migration, further indicating the urgency of addressing planetary warming (Burke and Stephens, 2018).

Several barriers have hindered the increased and commonplace investment in and use of renewable energy over fossil fuels. The common public impression is that renewable energy is not yet considered economically competitive with traditional forms of energy (Gielen et al., 2019); while this belief was previously true, more recent studies show that some forms of renewable energy are cost-competitive with conventional generation technologies (Bilicic and Scroggins, 2023). Economic barriers are correlated with the various social, technological and regulatory obstacles to renewable energy production, such as the delayed solar projects in the PJM (Pennsylvania-New Jersey-Maryland Interconnection) queue (Moorthy et al., 2019). Local conflicts around renewable energy infrastructure are just one example of a cause delaying the use of renewable energy. Yet the shift to renewable energy is achievable, as analysis by researchers Gielen et al. of future energy development demonstrates that the worst impact of climate change can be avoided while improving air quality, energy security, and energy access (2019).

Despite existing barriers, Pennsylvania has the resources needed to accelerate the transition to renewable energy sources. For instance, the Solar Energy Industries Association projects that Pennsylvania is expected to add 3,048 megawatts (MW) of solar over the next five years, and the state has the potential to increase its hydropower capacity by over 600 MW (SEIA, 2022; EIA, 2022). With the passage of proposed pro-renewable policies, clean energy development in Pennsylvania could grow rapidly. For this purpose, many PA environmental nonprofits support legislation that requires an increase in solar energy procurement, enables community solar, and incentivizes solar development through finance programs (PA Solar Center, 2023).

Renewable energy is critical to sustainable development and environmental justice, especially to meet the energy demand of the rising population (Moorthy et al., 2019; Burke and Stephens, 2018). States, such as Pennsylvania, have a key role to play in promulgating ambitious renewable energy policies that can surpass the progress of decision makers at the national level and/or lead to more efficient action (Bayulgen, 2020). Energy policymakers must diversify energy sources to include a much higher share of clean energy (Usman et al., 2020), a process

that can be heavily influenced by external advocates. The social aspect of resistance to renewable energy is next considered in order to best understand the context of the audience targeted by PA nonprofits' clean energy advocacy.

Common perceptions of clean energy

Social acceptance is a significant factor in the success of governmental policies around which generation sources are used to satisfy the increasing demand for energy (Moorthy et al., 2019). The American public's opinion of energy sources is highly reflective of the perceived personal advantage a source provides (Bronfman et al., 2012). Although demographics, belief systems, and other factors, such as technology type, influence public opinion, these characteristics do not explain much of the volatility in renewable energy support (Bayulgen and Benegal, 2019). For instance, according to a study conducted in North America by Hazboun and Boudet, political ideology was proven a less consistent predictor of clean energy support than was perceived importance of the fossil fuel and renewable industries (2020). Rather, a variety of other factors—such as the pace of technology change, lack of knowledge about renewable technologies, and status quo of current energy infrastructure—explain the public's deference to the media or politicians on energy-related topics (Bayulgen and Benegal, 2019).

Lack of understanding of renewable energy is a major reason for opposition to its development. The public has insufficient knowledge of clean energy's financial and environmental benefits, how renewable energy technologies work, and the feasibility of renewable projects (Nasirov et al., 2015; Bayulgen and Benegal, 2019)—which may be heightened due to fear and uncertainty inspired by the fossil fuel industry. As such, the current literature suggests that greater communication and education about the effects of unfamiliar renewable energy sources are beneficial ways to increase public acceptance and, as a consequence, greater use of these technologies (Hazboun and Boudet, 2020; Bayulgen and Benegal, 2019). Therefore, sustained and pervasive educational efforts are needed. Leiserowitz et al suggest that about 16% of Americans do not believe that global warming is occurring; nonetheless that renewable energy uptake is needed to address the energy problem Americans currently face (2019). There exists a wide disconnect between experts, such as health professionals and researchers, and the US public about climate and environmental health impacts

and needed solutions. Most Americans do not have an accurate understanding of the risks posed by climate change, and advancing the public's knowledge of climate threats is a crucial way to increase support for climate-friendly policies (Kotcher et al., 2021).

In addition to lack of education and misinformation, apathetic attitudes toward renewable energy development in the US are also heavily influenced by American values of consumption, abundance, and freedom. An example of this is how people often do not understand why technologies such as wind turbines and solar panels are needed in place of traditional, extractive fuels (Moorthy et al., 2019). Many Americans "...believe they are entitled to cheap and abundant electricity, but they lack the necessary understanding of what needs to occur so they can continue to have access to such a supply" (Sovacool, 2009). Due to disproportionately high government subsidies and grants, conventional energy sources are still inexpensive and competitive, which is a disadvantage to support for and feasibility of renewable energy installations. Without an influx of funding and policy-created incentives, advancements in cost reduction of renewable energy technologies remain at a relatively slow pace (Moorthy et al., 2019). Furthermore, the impacts of continued financial and political support for fossil fuels, such as strains on natural resources and impacts such as air pollution, are often out of the public's view (and, therefore, their minds), with the result that the benefits of clean energy are not directly observable either (Kotcher et al., 2021; Sovacool, 2009).

Another social barrier is that while some people support renewable energy development, they subscribe to the "not in my backyard" (NIMBY) ideology. Local communities may have concerns about renewable energy's impact on landscapes (including the large amount of land needed), possible environmental degradation, lack of skilled labor, and their own inequitable representation in the construction and development process (Moorthy et al., 2019). NIMBYism exists because people are often attached to the character of where they live and prefer that renewable energy projects are sited elsewhere (Peterson et al., 2015). However, locally felt impacts of climate change could change people's minds about renewable energy production in and for their communities: only 38% of Americans say that they have experienced global warming effects (Leiserowitz et al., 2019). Making the connection between climate risks and everyday effects such as heat-related illnesses is important so that Americans realize that climate change is a personally relevant crisis rather than one from which they can psychologically distance themselves (Leiserowitz et al., 2019). Helping people understand and care about

electricity and energy policy remains challenging even in the face of a local crisis, though; for example, during the 1973 oil crisis, very few Iowan residents (less than 15%) sought to influence elected officials' energy decision making (Sovacool, 2009). Especially in the modern age of social media and vast media coverage, people are exhausted with and numb to hearing news about the environment and energy crisis (Guo and Saxton, 2018; Sovacool, 2009). Despite the drawbacks of social media, these online platforms are also beneficial tools used by many nonprofits to communicate information, educate various demographics, and empower their audience to take action (Bass et al., 2014).

Ultimately, many psychological factors must be overcome to change mindsets concerning renewable energy. Comfort was identified as the most important factor determining energy use of American couples surveyed by Becker et al (1981). The desire for comfort is a trend that holds true today, demonstrated by the strong preference of many citizens and political incumbents to preserve the fossil fuel-dominated status quo (Becker et al., 1981; Bayulgen, 2020). Social stigmatization of renewables and energy efficient practices is another reason why people favor traditional fossil fuels. People prefer the status quo and quicker rates of return, and they place higher value on familiar products, such as fossil fuels. Consequently, many members of the American public dismiss calls for change because they are committed to the ways things have always been: powered by familiar energy technologies (Sovacool, 2009). Cultural barriers are just as, if not more, important for renewable energy advocates and policy makers to target as economic issues (Burke and Stephens, 2018; Sovacool, 2009). Therefore, more research is needed to better understand how to overcome socio-cultural obstacles in favor of pro-environmental behaviors and mindsets (Newell et al., 2014).

Nonprofit history in the US

The background of nonprofit organizations more broadly is important for a robust understanding of the work conducted by environmental nonprofits. In the US, the government has more or less consistently protected citizens' right to associate; in the case of nonprofits, citizens form groups to advocate for causes such as abolishing slavery, allowing women to vote, and regulating child labor (Gronberg and Salamon, 2012). Dating back to the 1830s, the US government was decentralized, and voluntary associations were prevalent in daily life, promoting participation in local issues (Anheier, 2014). Moreover, the US government's relatively low

investments in services such as social welfare, education, and health have given rise to a substantial nonprofit sector focusing on both advocacy and supplying these public goods (Anheier, 2014). Nonprofit organizations have largely taken on the task of providing functions that the government once sought to perform—as part of the post-World War II welfare state—thus forming the core of American civil society (Anheier, 2014). Because they serve the public benefit, nonprofits are nearly always exempt from federal, state, and local taxes. While these organizations are permitted to earn profit, defined as a surplus of income over expenditures, this earned income cannot be distributed to any of the organization’s managers or directors; instead, it is invested back into the organization (Salamon, 2012).

The American democratic system grants individuals the ability to join together in advancing their own approach for achieving the common good, which is often carried out by nonprofits (Lohmann, 1992). Composed of voluntary, private associations, the nonprofit sector is sometimes known as the third sector—following first the government and public administration and secondly the business sector. A diverse array of entities comprise the third sector, including universities, museums, research institutions, policy think-tanks, health-related establishments, human services, religious organizations, sports clubs, environmental groups, and even “cultural and political values and norms” (Anheier, 2023; Anheier, 2014). Nonprofit organizations in the US have been involved in many of today’s major policies and laws, reflecting the sentiment that advocacy work is “...part of the nonprofit ecology, part of our cultural heritage” (Bass et al., 2014). A key player in the policymaking process, nonprofits connect citizens and their elected officials, educate the public about salient problems, sponsor campaigns, and fund causes (Leroux and Goerdel, 2009). Besides lobbying the government, nonprofits have also performed functions that serve the public, such as scientific research and caring for the poor (Gronberg and Salamon, 2012). The nonpartisanship of nonprofits combined with the lack of ability to earn profits strengthen the credibility of these organizations, as they are most often genuinely focused on the public interest. Common arguments for the importance of and right to engage in advocacy include this historical role, constitutional right to assembly, legal regulations permitting advocacy, and moral reasons (Bass et al., 2014). By 2007, about one-quarter of nonprofits were estimated to regularly engage in advocacy (Child and Gronberg, 2007). More recently, Ward et al. have documented increasing trends in nonprofit advocacy, particularly through lobbying (2022).

In the 1960s and 70s, deemed the Great Society era, the government supported growth of the nonprofit sector and helped fund organizations through grants and contracts. During this time, the government was relatively highly responsive to nonprofit demands for expanded social and political rights (Gronberg and Salamon, 2012). Characterized by the objectives of voluntarism, civic activism, commercialism, and professionalism, nonprofits of the 1960s enjoyed a strong partnership with government (Salamon, 2012). The nonprofit sector continued to expand in the 1980s but faced challenges that still shape their modern relationship with government. These challenges include the following: reduction and marketization of funding, devolution of decision making from the government to states, restricted tax advantages, more complicated government structures, and increased competition for funding. Government funding of nonprofits has been increasingly cut in the wake of the 2008—2009 financial crisis, especially on the state and local levels (Anheier, 2014). These increased pressures, especially the financial fluctuations, have adversely affected government-nonprofit relations and reflect threats to many nonprofits' missions (Gronberg and Salamon, 2012). Despite these challenges, nonprofits have adjusted well and continue to adapt to increased commercialization and technological advances. They are becoming more integrated with the American market system due to increased demand for their services, cuts in government funding, growing interest from and availability of corporate partnerships, and expanded demands for accountability and performance standards (Young et al., 2012).

Over time, nonprofits have become more professionalized and specialized in the services they provide, largely because of more limited flexibility in how funds can be used and the more narrow niches they now fill (Bass et al., 2014). Nonprofits have been affected throughout their history by greater market engagement, and, as a result, have become more competitive in securing donations, adopting more complex organizational structures and management practices, and taking advantage of technology (Prakash and Gugerty, 2010). For these reasons, as well as increased efforts to earn income, nonprofits are more independent of the government or philanthropists than ever before (Young et al., 2012). However, nonprofits' complex relationship with the government remains influenced by other factors in addition to funding, including mandates, regulations, and support such as expertise (Saitgalina et al., 2022; Anheier, 2014). American nonprofits have overcome many challenges—e.g. fiscal, technological, and legitimacy-related—and have formed a powerful sector consisting of efficient and influential

organizations (Salamon, 2012). At the end of 2022, nonprofits had contributed \$1.5 trillion to the US economy and exceeded employment levels prior to the COVID-19 pandemic (Independent Sector, 2023).

During the past 25 years, most industrialized countries have increasingly supported expanded roles for individuals and nonprofit organizations to become involved in state affairs, corresponding with the global rise in democracy (Anheier, 2014). There are significant opportunities for expanded success for the nonprofit sector, including the following factors: greater visibility and requisite increased academic interest in the sector, new technological advancements, and philanthropy growth due to transfers of intergenerational wealth and corporate involvement (Salamon, 2012). Nonprofits have highly recognized social and economic power, stemming from increasing doubts about the state's ability to address developmental, welfare, and environmental issues (Anheier, 2014). The role of nonprofits in society and government is further discussed in the next section.

The role of nonprofits

The nonprofit sector consists of organizations outside of the government and private sector, which involve voluntary participation, operation without earning profit, and representation of citizens' interests (Guo and Saxton, 2010). Nonprofit organizations are also institutionalized and self-governing, with the purpose of building social capital, or "...the sum of actual and potential resources that can be mobilized through membership in social networks of individual actors and organizations" (Anheier, 2014). Because they serve the public benefit, nonprofits are nearly always exempt from federal, state, and local taxes. While these organizations are permitted to earn profit, defined as a surplus of income over expenditures, this money cannot be distributed to any of the organization's managers or directors as income (Salamon, 2012). To support their missions, nonprofits are often publicly funded by the government in the form of direct grants, contracts, subsidies, and even third-party payments. Third-party payments became increasingly common in the 2000s, and include payments similar to vouchers so that nonprofits ultimately receive earmarked services (Anheier, 2014).

Nonprofit organizations exist for different reasons, largely related to failures of the government and other institutions to provide public goods and services. Public goods in this context, such as clean air and renewable energy, are often common pool goods, meaning that

they are both nonexcludable and rival (without property rights but limited in availability) (Anheier, 2014). Environmental nonprofit organizations, in particular, often aim to fill gaps left by the government such as environmental service provision, monitoring or enforcement and more, specifically to advance social causes (Grant and Grooms, 2017; Clear and Holloway, 2018; Weisbrod, 1988). This theory of nonprofits as “gap-fillers” stems from the idea of market failure: that nonprofits supply public goods unlikely to be provided by for-profit or governmental entities (Anheier, 2014). In contrast to the public goods theory of nonprofit organization, theories linked to trust are based on the premise that information asymmetries arise from the provision of goods and services. Nonprofits are well-positioned to benefit from a greater degree of public trust than private firms and are perceived as more reliable because they are not incentivized by gaining profit (Anheier, 2014). Yet another theory posits that nonprofits may have entrepreneurial aims, exhibited through combining their own objectives, such as gaining members through providing them with desirable services (Anheier, 2014).

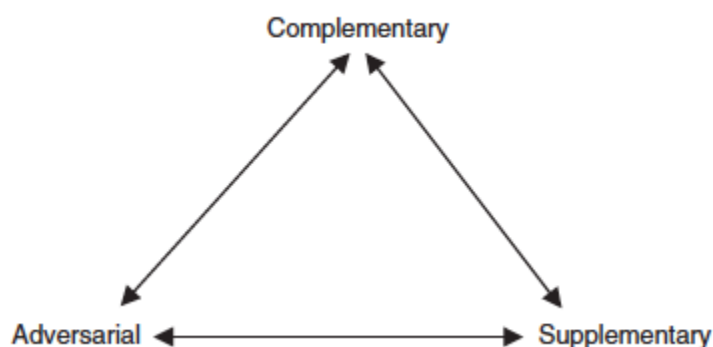
Furthermore, divergent theoretical views have been proposed in regards to the normative role of nonprofit organization. One group of sociologists consider nonprofits as working in a positive way, increasing social capital and bolstering communities; the other asserts that control of nonprofit groups is largely in the hands of the wealthy, thus reinforcing their dominance rather than truly helping communities. The economic theory of nonprofits is that they emerged to correct market failures, providing goods and services that may be affected by public goods problems (e.g. free riding, a market failure that occurs when those who benefit from public goods insufficiently contribute to their procurement) (Sager, 2010).

Following the economic view, nonprofits are essentially collective action institutions that advocate for certain policy interests (Leroux and Goerdel, 2009). Collective action is the cooperation of individuals to achieve common goals rather than independently working for their self-interest (Prakash and Gugerty, 2010). Alternatively, neo-institutional theories of nonprofits argue that government funding for nonprofits has developed a nonprofit sector richer in scale and variety of services than those offered by government-run programs (Smith & Gronbjerg, 2006). Those who believe in a more limited state prefer that nonprofits function completely separate from government and address social ills without influence, while others have emphasized the necessity of government involvement in solving social problems alongside nonprofits. Regardless of these competing perspectives, nonprofits and the government currently interact

through relevant government funding, tax policy, regulations, and general governmental policies (Gronberg and Salamon, 2012).

There are different theories regarding the relationship between nonprofits and the government. Young (2000) argues that nonprofits work both in partnerships and as rivals with governmental actors, while Frumkin (2002) considers nonprofits as independently created, active participants in the development of public policy. Young (2000) asserts that the main purpose of nonprofits is to provide information to reduce asymmetries between both producers and consumers and government and constituents. He identifies three models in which this role is carried out: supplementary, complementary, and adversarial (Figure 2). According to Young, nonprofits can supply unprovided public goods (supplementary), assist governments in delivering public goods (complementary), and/or neglect to engage in relations with the government (adversarial) (2000). The complementary approach is mirrored by the interdependence theory of nonprofit and governmental relations, which states that the nonprofit sector's strengths correspond with the government's weaknesses, and vice versa (Anheier, 2014,). In a slightly different perspective, Frumkin (2002) identifies four key roles of nonprofits: to supply services, innovate, engage in politics, and express values, in ways unconstrained by government influence. These nonprofit-driven activities influence both the content of and participants in policy debates (Gronbjerg and Prakash, 2016).

Figure 2: Types of nonprofit-government relations.



(Young, 2000; Anheier, 2014, p. 433).

Other scholars view nonprofits as unique in that they “...provide a conduit between individuals, who are often vulnerable, and business and government, and offer communities’ valuable services, resources and support” (Clear and Holloway, 2018), complement government efforts to rectify issues (Chanse, 2011), and voluntarily supply public goods that the government has not provided (Handy, 2001). Environmental nonprofits, in particular, are perceived as an efficient and influential vehicle through which individuals can improve environmental quality and compliance (Handy, 2001; Grant and Grooms, 2017). According to Salamon (2012), nonprofit organizations serve as a “critical safety valve” through which affected groups can obtain support and representation through building reciprocity and trust and safeguarding national value of the public good (Salamon, 2012). In this way, nonprofit organizations help keep elected officials in check, maintain democratic norms, and mobilize civic action for better governance (Pacheco-Vega and Murdie, 2020).

Nonprofits engage in these various objectives and roles through many different techniques and tools, including education, protests, lobbying, capacity building, and local activism (Keck and Sikkink, 1998). Local engagement and knowledge are important for the cultivation of more nuanced nonprofit support and advocacy to smaller communities (Fyall, 2017). Advocacy is often undertaken to pressure the government to act in a certain way that the nonprofit believes best meets the public interest (Prakash and Gugerty, 2010). Because of their goal of benefiting the public, the nonprofit sector is considered a crucial player in civil society on all levels: from local to global (Anheier, 2014). Today, environmentally-based nonprofits are heavily involved in advocating for pressing issues such as climate change and renewable energy systems (Gronberg and Salamon, 2012). Pollution is the most commonly targeted environmental advocacy problem globally, and climate change was connected to 76% of studied advocacy events in the Americas (Haddad, 2021). In the environmental arena, nonprofit activities can complement government efforts by engaging a greater number of citizens in volunteer work, helping to respond to environmental disasters, and influencing policy debates (Chanse, 2011; Gronberg and Salamon, 2012).

The history of environmental movement in the US and Pennsylvania

The environmental movement in the US has had significant effects since the 1960s, emerging from Rachel Carson's publication of *Silent Spring*. Alongside other social movements, public sentiment shifted toward environmental protection, and people formed voluntary associations to attract the attention of businesses and government (Handy, 2001; Sirianni and Sofer, 2012). Some of the theorized reasons for the growth of the nonprofit advocacy section include post-Watergate and congressional reforms, political polarization between the two political parties in the US, and conflicts over deregulation (Andrews and Edwards, 2004). Over time, informal associations evolved into larger, formal nonprofit organizations, which gained traction from sustained interest and the support of donations and memberships (Handy, 2001). Early environmental organizations included the Sierra Club, Earth Action, the National Audubon Society, and the Natural Resources Defense Council. In 1970, the first Earth Day occurred, and mounting frustrations were expressed across the US, particularly on college campuses (Young, 2010). With the growing interest in environmental regulations, these nonprofit groups participated in the writing and editing of much of the US' environmental legislation (Young, 2010).

Political advocacy is a key function of nonprofits; the Center for Responsive Politics (CRP) found that annual lobbying expenditures by nonprofits grew from \$9.74M in 1998 to \$64.76M in 2018 (Ward et al., 2022). Over the years in the US, the nonprofit sector has played a notable role in the passage and implementation of many pro-environmental policies.

The majority of environmental organizations are nonprofits (Salamon, 2012). US nonprofits are tax-exempt organizations that fall under one of two categories under the Internal Revenue Code. 501(c)(3) organizations can participate in nonpartisan advocacy and limited lobbying, while 501(c)(4)s are allowed to undertake some partisan activity and unlimited lobbying (Pekkanen and Smith, 2014; Salamon, 2012). Another difference in these two types of organizations is that 501(c)(3)s are permitted to receive tax-deductible donations because of their charitable, scientific, and educational purposes, while contributions to 501(c)(4)s (social welfare groups) are not tax-deductible (Salamon, 2012). For example, the environmental advocacy group PennFuture is a 501(c)(3), while their partner organization, Conservation Voters of Pennsylvania, is a 501(c)(4) and is allowed to participate in elections and politics directly.

Environmental nonprofits serve a variety of purposes, including advocacy and political lobbying, ecosystem-based preservation and restoration efforts, and environmental education. Alongside advocacy and political lobbying, civic activism has been a strategy many environmental nonprofits promote to engage voters. Many of these organizations engage in more than one of the aforementioned categories and are involved in collaborative partnerships with other stakeholders to attain their objectives (Sirianni and Sofer, 2012).

The past decade has seen an increase in renewable energy and environmental justice advocacy in the wake of worsening effects of climate change (Burke and Stephens, 2018). Since the 1970s, groups such as the Sierra Club have called for their members to demand pro-renewable energy policies from their elected representatives, a bottom-up advocacy technique that is executed to a greater extent today. Environmental nonprofits have played and continue to acknowledge and raise awareness about the connections between energy production, air pollution, and global warming (Lyakhov and Gliedt, 2017). As the environmental movement continues to expand and gain power, energy issues are located high on their agendas (Sirianni and Sofer, 2012; Lyakhov and Gliedt, 2017).

Pennsylvania is a historic swing state in which issues concerning the environment, including renewable energy integration into the power grid, are contentious and consistently debated. The state is considered “purple” (dominated by neither Republicans or Democrats) and is slow to adopt changes despite the gradual decline of its fossil fuel-powered heavy industries (Frey and Teixeira, 2008). In general, Republicans are less likely to support environmental solutions and more likely to reject the reality of climate change than are Democrats (Bayulgen, 2020). Therefore, in Pennsylvania, many nonprofits focus on one environmental issue in particular: pollution and other adverse impacts from the state’s major export: fossil fuels. After Texas, Pennsylvania is the second-largest energy exporter to other US states, a tribute to the state’s reliance on mining and natural gas fracking. Mostly from the Marcellus Shale, PA produced 7.6 trillion cubic feet of natural gas in 2021 (EIA, 2022).

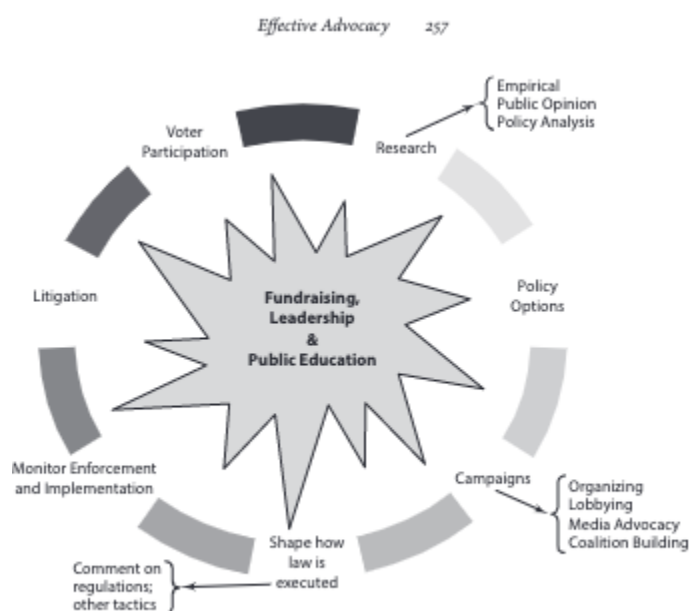
Pennsylvania’s dependence on fossil fuels began in 1859, when the US’ first oil well was constructed in Titusville. Oil, coal, and natural gas were pivotal to the success of industrial growth in PA and provided most of its energy in the 20th century (PennFuture, 2019). Despite the state’s history of air pollution disasters and acid mine drainage, Pennsylvania is one of few with an Environmental Rights Amendment in its Constitution stating: “The people have a right to

clean air, pure water, and to the preservation of the natural, scenic, historic, and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people" (DEP, n.d.). The purpose of many PA-based environmental nonprofits is to advocate for the preservation of energy resources and clean air; they advocate for renewable energy instead of fossil fuels using a range of strategies.

Environmental nonprofits' advocacy strategies

Advocacy, one major activity of nonprofits, is defined as "the attempt to influence public policy, either directly or indirectly" (Pekkanen and Smith, 2014). An alternative and widely accepted definition is provided by Reid: "any attempt to influence the decision of any institutional elite on behalf of a collective interest" (1999). The broad range of activities that can be classified under the advocacy umbrella is vast and includes lobbying, litigation, organizing, educating, and, most fundamentally, speaking out for a cause (Pekkanen and Smith, 2014, Bass et al., 2014). Various advocacy activities, which can be considered under the umbrella of "fundraising, leadership and public education," are shown in Figure 3. These activities require different approaches, which vary from cooperative to confrontational to administrative work to relationship building (Clear and Holloway, 2018). Causes are often identified by nonprofits because they are insufficiently addressed and in need of public attention (Salamon, 2012). Additionally, levels of advocacy vary across nonprofits, from grassroots organizing to high level political engagement (Leroux and Goerdel, 2009). More nonprofits organizations are engaging in diverse forms of advocacy than ever before, as are other types of actors and interest groups (Mosley et al., 2022). To strengthen and expand their advocacy efforts, successful nonprofit leaders have dedicated advocacy staff, build the lobbying and advocacy skills of their staff, foster a supportive environment, leverage employees' skills, and have available guidelines for rapid decision making when needed (Bass et al., 2014).

Figure 3: Types of advocacy activities.

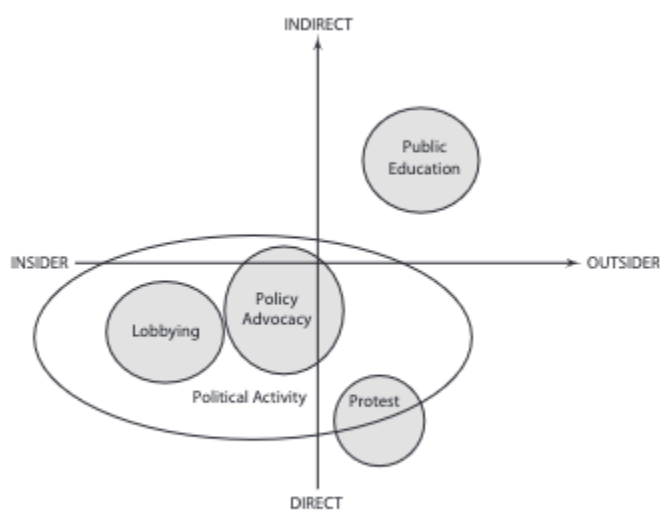


(Pekkanen and Smith, 2014, p. 4)

Motivations for advocacy can be either instrumental—for the benefit of the organization itself or its constituents—or expressive—which develop from core beliefs rather than from the desire for self-interested gain (Mosley et al., 2022). In other words, nonprofits' policy aims and objectives arise from some combination of interests held by their organization, their members or beneficiaries, and/or the wider community (Gronberg and Prakash, 2016). The success of nonprofit advocacy (outputs) has been linked to the extent to which the organization engages in public participation and engagement (constituent inputs) (Guo and Saxton, 2010; Pacheco-Vega and Murdie, 2020). While many nonprofits participate in advocacy of some form, level of involvement is generally linked to the organization's size, charitable status, and field of work (Child and Gronbjerg, 2007). These efforts can affect governments by causing them to change or adjust existing laws and regulations and holding them responsible for providing environmental services (Handy, 2001). Common advocacy efforts can be placed on spectrums ranging from indirect or direct as well as whether they target insider or outsider stakeholders (Figure 4; Pekkanen and Smith, 2014). For instance, public education is an indirect advocacy activity because no direct contact with elected officials is made, but constituents may impact policy as a

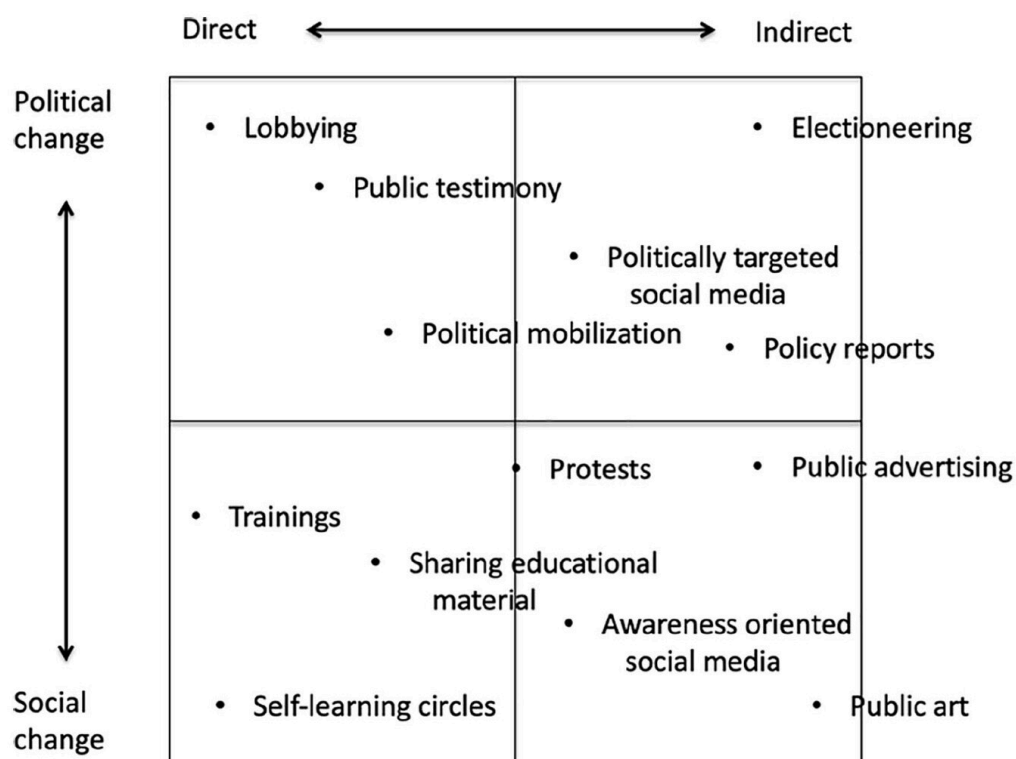
result of receiving education. On the other hand, lobbying elected officials through meetings and letters is a direct way to advocate for change. Another conceptualization (see Figure 5) of nonprofit advocacy activities is provided by Mosley et al. (2022), who also theorize that advocacy tactics fall on the direct-indirect spectrum. At the same time, the purpose of these activities can range from affecting social change (public awareness based) to political change (policy based). In this model, activities with a public audience are also considered indirect, while lobbying and training are more direct.

Figure 4: Types of advocacy, on spectrums of indirect-direct activities and insider-outsider geared influence.



(Pekkanen and Smith, 2014, p. 4).

Figure 5: A map of advocacy across a range of motivations (social-political) and tactics (direct-indirect).



(Mosley et al., 2022).

Environmental issues, including pollution, climate change, endangered species, erosion, and more are societal problems that many nonprofits actively address (Lyakhov and Gliedt, 2017). Particularly at the local level, nonprofits' work has been a major part of empowerment and community organizing efforts that influence social and environmental investments (Anheier, 2014). When successful, environmental nonprofits' lobbying efforts can be very powerful in directing greater resources to be spent on government efforts such as pollution reduction. An important way that environmental nonprofits advocate outside of lobbying efforts is increasing environmental awareness among the public, thereby creating a strong movement of people demanding environmental protection (Handy, 2001). Environmental nonprofits are increasingly focused on democratic governance and equitable participatory opportunities to accurately

represent citizens' interests (Guo and Saxton, 2010). Other key strategies used by environmental nonprofits include grassroots lobbying, scientific research and report drafting, voter registration, media advocacy, public events, civil disobedience, community mobilization, policy tracking and enforcement, and lawsuits (Avner, 2013; Lyakhov and Gliedt, 2017). Litigation has been considered one of the most impactful advocacy strategies for a variety of reasons, particularly due to its potential for efficiency in changing environmental policy (Young, 2010). In addition, litigation is useful for attracting public attention regarding causes and effects of environmental degradation (Sale, 1993). This kind of public "naming and shaming" can spur action regardless of the lawsuit's success by tarnishing the responsible party's reputation (Pacheco-Vega and Murdie, 2020).

With regard to the advocacy activities and strategies of environmental nonprofits, commonly held beliefs toward environmental issues discussed previously must be considered. These issues often fall low on Americans' lists of political priorities, presenting a unique challenge for environmental nonprofits (Anspach and Draguljic, 2019). Framing advocacy efforts and communications is therefore strategically conducted through personal, economic, and motivational perspectives. Economic and personal frames have been shown to be most successful in inducing psychological proximity as well as emotions such as anger and sadness (Anspach and Draguljic, 2019; Newell et al., 2014). Helping people connect their personal experiences to climate impacts—such as witnessing extreme weather events—is a powerful way to incentivize their belief in anthropogenic climate change and willingness to take pro-environmental actions (Akerlof et al., 2013; Newell et al., 2014). In that vein, people are more driven to change their environmental behaviors when climate change is framed as being both temporally and spatially close to them (Nicolaij and Hendrickx, 2003; Newell et al., 2014). Furthermore, promoting individuals' sense of self-efficacy, or belief that their own actions have significance, can also spur greater action for environmental issues (Anspach and Draguljić, 2019). Calls to action are most effective when using positive descriptive norms, indicating the importance of minimizing pessimistic, possibly anxiety-causing narratives (Doherty and Webler, 2016).

Social media offers a valuable communication platform for nonprofits to educate, engage, and mobilize large audiences quickly at a low cost, yet gaining attention in this increasingly crowded online space can be challenging (Guo and Saxton, 2018). In all forms of environmental

communication, the advocate should consider their audience's various worldviews and perception of environmental phenomena and which factors will most motivate them to take action (De Groot and Steg, 2010; Newell et al., 2014). Encouraging the participation of citizens in public policy is a crucial role of nonprofits for which skillful social media use, communication, education, and storytelling abilities are beneficial (Guo and Saxton, 2010).

Importantly, effective advocacy also involves building relationships: among members of the public, between the public and their elected officials, and with colleagues in the nonprofit sector. All too frequently, nonprofit leaders work in silos rather than taking advantage of opportunities to increase their strength through collaborative efforts. Coalitions are particularly valuable in increasing the strength of individual organizations by combining resources, sharing ideas and information, and leveraging greater credibility to influence policymakers more significantly (Bass et al., 2014; Leroux and Goerdel, 2009). The most effective coalitions bring together not only nonprofits but also facilitate collaboration with other stakeholders such as renewable energy producers, climate scientists, consumer groups, and pro-environmental politicians (Bayulgen, 2020). Other key aspects of environmental advocacy include the need to shift power dynamics, establish authority and credibility, and empower people to speak for themselves (Bass et al., 2014). The most effective advocates also retain sight of the big picture and their organization's vision, intentionally reflect on their work, and celebrate victories (Bass et al., 2014). When successfully executed, relatively small advocacy and lobbying efforts on the part of environmental nonprofits can yield substantial results; for instance, environmental nonprofits' advocacy expenditures are largely responsible for billions of dollars spent annually on activities such as pollution control (Handy, 2001).

Effective clean energy advocacy strategies

For an effective renewable energy transition to be realized, decarbonization efforts require the dismantling of dominant fossil fuels systems and infrastructure (Burke and Stephens, 2018). As such, fundamental and structural changes are needed in policy, technology, and institutions (Peterson et al., 2015). Local and state governments are well positioned to drive these changes due to their ability to intimately understand local concerns and relate to their citizens. State governments, such as PA, have the ability to create policy-based opportunities for more affordable consumption of renewable energy through monetary incentives, energy standards and

targets, infrastructure changes, and education campaigns (Bayulgen, 2020). Public engagement and education processes are especially influential in changing acceptance of renewable energy technologies (Peterson et al., 2015). However, state leaders affected by constituents and corporations with an interest in fossil fuels may not implement these changes on their own. Stakeholders, such as nonprofits, can play a pivotal part in determining renewable energy policy through lobbying and other advocacy techniques (Bayulgen, 2020).

In the environmental and clean energy sectors, some advocacy strategies are more effective than others in order to galvanize change. In studies assessing Americans' reactions to 360 different climate messages, the one identified as most compelling first discussed the detrimental effects of climate change on air quality, next described the consequences of increased clean energy use on human health and finally explained that many Americans are in favor of a clean energy solution (Kotcher et al., 2021). The health benefits of a clean energy transition were found most meaningful to study participants, followed by healthier communities and transportation, and the most well-received call for action asked people to contact their Congress representative. Together, the inclusion of impacts, a proposed solution, and a call to action were found to improve the effectiveness of clean energy messaging (Kotcher et al., 2021). This finding is supported by Maibach et al., who showed that providing information about the health consequences of climate change and fossil fuel-generated air pollution is engaging and personally pertinent to people with a range of views on climate change (2010).

In addition to health-centered messaging, economic frames are useful for growing interest toward and support for renewable energy. Particularly, focusing on costs such as lower electricity bills is more effective for changing attitudes than are positive economic frames discussing increased job creation and economic development (Ansolabehere and Konisky, 2016; Bayulgen and Benegal, 2019). This finding is due to people's preference for personal cost savings rather than wider economic benefits. Lastly, framing messages around familiarity is recommended because of people's preference for technologies they know and trust. Instead of presenting renewable energy as novel, advocates should raise awareness about the fact that clean energy technologies have existed for centuries (Sovacool, 2009).

One of the most daunting challenges of renewable energy advocacy is to dismantle the American cultural paradigm that considers renewable energy threatening to a comfortable and profitable way of life. Advocates must not only increase educational opportunities, but also

confront how appeals to values of consumption, freedom, and control are used to justify pollution (Sovacool, 2009). Intentional framing, such as these health and economic-focused messages, is important for policy advocates to reach a broader array of people on politically sensitive issues such as climate change (Bayulgen and Benegal, 2019; Hazboun and Boudet, 2020).

Other strategies are beneficial for advocates to utilize when working for increased adoption of renewables. For one, clean energy coalition building is an advantageous advocacy strategy, especially if the coalition considers framing renewable energy development in a way that is conscious of and sensitive to the local community (Hess and Gentry, 2019). Providing more extensive environmental and energy education is necessary to alter commonly held misconceptions and shift the public mindset toward sustainability. As an added bonus, more environmentally aware citizens are shown to reduce their own environmental impacts through participation in energy saving actions (Zafar et al., 2020). Furthermore, financial incentives, such as subsidies and funding for research and development, for clean energy are important policy aims that help level the playing field between renewables and fossil fuels; these monetary policies should be high on advocates' agendas (Newell et al., 2019; Moorthy et al., 2019). In general, successful renewable energy adoption on a subnational level often results from community concern about pollution from fossil fuels, higher education levels, a more progressive political culture, and state support of renewable energy policies (Hess and Gentry, 2019). Although advocates in the clean energy field face myriad social, regulatory, economic, and technical barriers, employment of the tactics discussed above have been proven effective in increasing acceptance and use of renewable energy (Moorthy et al., 2019).

Research design

Methodology

The main research question is: What are the most effective strategies in clean energy advocacy used by environmental nonprofits in Pennsylvania, in the experience of interviewed professionals? To answer this question, qualitative data from advocates working in this field was collected. Professionals with experience and knowledge of how to advocate for clean energy in PA were able to share insight into which techniques and approaches they considered to work well and what challenges they have had to overcome. To gather this data, 12 semi-structured interviews were conducted with voluntary participants who work in this field. Interviews were chosen for this thesis' methodology because of the detailed and diverse answers needed to sufficiently address the research questions. The use of semi-structured interviews allowed for follow-up questions and the gathering of in-depth information about each interviewee's experiences. Finally, as described in later sections, focused coding and analysis was utilized in order to identify key trends and recommendations from the interview transcripts.

Participant selection

Interview participants were selected in May 2023, when 12 professionals at environmental organizations across the state were contacted and asked if they were willing to participate in a thirty-minute interview. All interviewees are employed by environmentally-focused nonprofits in Pennsylvania, and they hold roles directly addressing clean energy, clean air, and/or climate advocacy. Participants were found through online research and chosen to intentionally represent different roles within the clean energy advocacy field, including an array of expertise in community organizing, lobbying, educating, and more. Some of the participants were selected due to convenience factors such as the author's familiarity with their organization, their location within Pennsylvania, and their willingness to be interviewed for this study. This purposeful sampling was employed in order to gain maximum insight within a short time period. The participants' names, roles, and organizations are displayed in the following Table 1. Table 2 includes each organization's mission statement and a link to learn more.

Interviewee	Role	Organization
DM - Daniel Mayer	Policy Advocacy & Outreach Associate (PA)	The Nature Conservancy
EC - Elowyn Corby	Mid-Atlantic Regional Director	Vote Solar
JQ - Jennifer Quinn	Legislative and Political Director	Pennsylvania Sierra Club
JC - Jess Cadorette	Field Director	PennFuture
JK - Joanne Kilgour	Executive Director	Ohio River Valley Institute
MO - Melissa Ostroff	Pennsylvania Policy and Field Advocate	Earthworks
MC - Monica Carey	Pennsylvania Program Director	Solar United Neighbors
RA - Rob Altenburg	Senior Director of Energy and Climate	PennFuture
SC - Shannon Crooker	Pennsylvania Director	Generation180
SP - Sharon Pillar	Founder and Executive Director	PA Solar Center
VL - Vanessa Lynch	Pennsylvania Field Consultant	Moms Clean Air Force
ZB - Zach Barber	Clean Air Advocate	PennEnvironment

Table 1: Interview participants' roles and organizations.

Organization	Mission Statement	Website
The Nature Conservancy	The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends.	https://www.nature.org/en-us/about-us/where-we-work/united-states/pennsylvania/
Vote Solar	Our mission is to realize a 100% clean energy future through a solutions-driven, people-first approach.	https://votesolar.org/usa/pennsylvania/
Pennsylvania Sierra Club	Our mission is to explore, enjoy and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; to educate and enlist humanity to protect and restore the quality of the natural human environment; and to use all lawful means to carry out these objectives.	https://www.sierraclub.org/pennsylvania
PennFuture	PennFuture is leading the transition to a clean energy economy in Pennsylvania and beyond. We are protecting our air, water and land, and empowering citizens to build sustainable communities for future generations.	https://www.pennfuture.org/#:~:text=PennFutureOur%20Mission%20%26%20Priorities,sustainable%20communities%20for%20future%20generations.
Ohio River Valley Institute	The Ohio River Valley Institute's mission is to support communities in the region working to advance a more prosperous, sustainable, and equitable Appalachia.	https://ohiorivervalleyinstitute.org/about/
Earthworks	Earthworks fights for clean air, water and land, healthy communities, and corporate accountability. We work for solutions that protect the Earth's resources, our climate, and our	https://earthworks.org/locations/pennsylvania/

	communities.	
Solar United Neighbors	We're a community of people building a new energy system with rooftop solar at the cornerstone. We help people go solar, join together, and fight for their energy rights.	https://www.solarunitedneighbors.org/pennsylvania/
Generation180	Generation180 is a non-profit working to change the narrative around clean energy. We inspire and equip people to take clean energy action.	https://generation180.org/
PA Solar Center	Our mission is to provide trusted guidance to usher all Pennsylvanians into the clean energy economy in order to create more resilient communities.	https://pasolarcenter.org/about/
Moms Clean Air Force	Our mission is to protect children from air pollution and climate change. We envision a safe, stable, and equitable future where all children breathe clean air.	https://www.momscleanairforce.org/state-chapters/pennsylvania/
PennEnvironment	PennEnvironment works for clean air, clean water, clean energy, wildlife and open spaces, and a livable climate. Our members across the state put grassroots support behind our research and advocacy. We envision a greener Pennsylvania: one that protects more places where nature can thrive, and offers us and our children a greater opportunity to live healthier, more enriching lives. Through our research, public education, advocacy, litigation and action, we advance policies and practices that put our state and our country on a better path.	https://environmentamerica.org/pennsylvania/center/about/#:~:text=PennEnvironment%20Research%20%26%20Policy%20Center%20has,live%20healthier%2C%20more%20enriching%20lives.

Table 2: Interviewed organizations' mission statements and website links.

The interview process

The interviews were conducted via Zoom over the span of approximately one month in late spring 2023. Holding the interviews on Zoom extended the reach of this research, as professionals across the state of Pennsylvania were able to participate much more easily than if travel had been required. However, the virtual setting presents a unique set of both advantages and challenges for these interviews. For instance, while Zoom lowers barriers to participation—in terms of time needed and transportation ability—the platform can also inhibit natural conversation. Discussions via a screen are inherently different from in-person conversations, beginning with each participant's awareness of how they look to others and of the recording feature. On Zoom, it is also more difficult to read one other's body language, which could reduce participants' comfort levels. Yet Zoom was especially convenient in this case because both the researcher and interviewee could remain in their own space while having the conversation and return afterwards to other work without much transition time. Because of the low time commitment needed for a Zoom interview, participants were probably more likely to agree to the interview.

Each interview lasted approximately 30 minutes and was semi-structured, meaning that while the researcher had planned questions, the conversation flowed in a natural manner and questions were added and/or altered during the interview. The prepared questions, which most interviewees were asked, are as follows:

- Can you tell me a bit about your background and how you became interested in environmental and clean energy advocacy?
- What does your work look like on a daily basis, and who do you work with?
- Who have been some of your most effective partners? Who has been less beneficial to partner with? Why?
- What have been some of the biggest challenges you have faced in advocating for clean energy policy in Pennsylvania?
- In your experience, which advocacy strategies have been most successful? Why?

- How do you approach conversations with or advocacy efforts geared toward those who are disinterested in clean energy?
- How do you see the role of nonprofit environmental organizations in clean energy advocacy evolving in Pennsylvania's future?
- Do you have anything else you would like to add about this topic?

The aim of these questions was to better understand interviewees' backgrounds and experiences, then identify effective advocacy strategies from their work promoting either clean energy, clean air, or both. In most cases, the conversation took a unique direction than expected and new information/questions arose throughout the interview.

Qualitative interview analysis

Ethical considerations were prioritized during the interview process, as the researcher guaranteed each interviewee confidentiality and ensured that participation was voluntary. With the consent of the interviewees, each interview was recorded for analysis purposes. Every participant was also provided with the thesis draft before publication and their suggested edits were made. Interviewees also confirmed that their initials and organization names could be used in the published thesis.

In this thesis, the principles of qualitative methodology were followed according to Hammersley and Atkinson (2019). First, the interviews were transcribed and reread multiple times to recognize trends and key information. From this improved understanding of trends and themes prevalent throughout the interviews (inductive coding), recurring categories were identified. The researcher then coded each of the interview transcriptions by placing phrases under the thematic category to which they best corresponded. This process was conducted manually through use of highlighting / color coding information that best fit each theme. Throughout the interview process, the coding categories were adjusted, meaning that the content of certain interviews led to the addition of new categories, adjustments to the wording of others, and / or new subcategories. Essentially, the coding process was a flexible, evolving methodology used to classify and efficiently process the main themes and recommendations from the interviews in order to identify theoretical ideas about which clean energy advocacy strategies are

the most effective (Hammersley and Atkinson, 2019). Most of the information gained from the interviews conducted for this thesis can be classified under one of the following categories as seen in Table 3 below:

Category	Sub-Categories (if applicable)
Defensive strategies	
Barriers to progressive policy	History of extraction, lack of forward motion and concern, lack of education, political disagreement, overwhelming people, cost of technology, equity problems
Personal and tangible experiences	
Coalitions / collaborations	
Environmental policy champions	
Policy and litigation	Regulations
Connections and relationships	Strategy and messaging; appeal to logic, with environmental supporters, with those unwilling to listen; strategic relationships, with affected communities
Informing	Gathering / assessing information, educating, correcting misinformation, media
Constituent action	
Money and resources	
Optimism	

Table 3: Categories identified and used in the coding and analysis of semi-structured interviews.

The result of the coding process was an organized document with direct quotes from each interviewee corresponding with each of the preceding categories. This system allowed for focused analysis of each key theme from the interviews. After completion of all interviews, the coding results were compiled, analyzed, and summarized in the following section. The use of thematic coding produced five major recommendations for current and future environmental and clean energy advocates in Pennsylvania, which are outlined in the discussion.

Results

The following section contains an organized summary and analysis of the interviews conducted for this thesis. All assertions can be considered subjective, as they are primarily quotes from interviewees and interpretations from interviews made by the author. The results provide only a glimpse into renewable energy advocacy, as many more stakeholders and organizations are involved in this work than those interviewed.

Role of environmental nonprofits in clean energy advocacy

One of the most significant takeaways from the 12 interviews conducted for this research is that environmental nonprofits in Pennsylvania serve a wide variety of roles in their clean energy and clean air advocacy work. As expanded upon below, these organizations are predominantly aiming to advance a more sustainable future for Pennsylvania instead of continued dependence on fossil fuels. The research participants explained several methods used for advancing their various missions, including education, lobbying, engaging with community members, researching and sharing results, litigating, and many others. Many identified their role as building connections between the government and communities, as they educate Pennsylvanians about happenings in Harrisburg as well as meet with lawmakers to share their constituents' priorities. The environmental advocates interviewed for this project, particularly those in the field of clean energy, are deeply engaged in both legislative and community affairs, focused on environmental justice, and aim to create a healthier, clean energy system that meets all Pennsylvanians' needs.

Importantly, JC explained that she views the advocacy role of environmental nonprofits as just one important "avenue for change." Advocates and their organizations must recognize that their work is crucial alongside those performing direct action, reporting environmental news, and fighting for environmental protections in the courts. As will be discussed in greater depth below, many interviewees agreed that coalition building and uplifting intersectional work is critical to driving change, particularly in a state as divisive as Pennsylvania. However, the myriad roles of Pennsylvania's environmental advocates are hindered by many challenges, including the state's history, residents' opposition to clean energy, lack of environmental education, and overarching political disagreement.

Challenges faced in clean energy advocacy

History of extraction in Pennsylvania

A few participants spoke about having to predominantly advocate defensively, meaning they work to prevent fossil fuel subsidies, stop regulatory reform that would detract from the Department of Environmental Protection's abilities, and correct climate denial or other misguided beliefs. By focusing on this defensive role in their legislative and educational work, advocates are often unable to establish new progressive policies, such as aggressive clean energy standards, but instead spend time maintaining the status quo. The greatest barrier to implementing solutions for a healthy, resilient future was identified repeatedly by interviewees: the impact of Pennsylvania's history of and continued reliance on fossil fuel extraction.

Pennsylvania's economy was driven by timber in its early days, then coal and oil, and is now dominated by the fossil fuel industry. As SP aptly explained, "It was coal... but now gas is king. And solar is a huge threat to natural gas." Residents are accustomed to extractive industries and the massive monetary influence exerted by these companies; for example, they have reaped the benefits of natural gas drilling on their land for generations. Due to the past and maintained economic success of fossil fuel companies, one interviewee asserted, it remains challenging to change the minds of elected officials and their constituents that the economy can thrive without fossil fuels—many still feel a need "to go back to some imagined glory day of steel" (ZB).

In numerous interviews, renewable energy advocates expressed the barrier imposed by Pennsylvania's heritage of fossil fuel production and export. MC stated that the "heritage of fossil fuel production in Pennsylvania is something that evokes a real visceral response from people." Pennsylvanians' reactions to discussion of solar development can vary from interest to fear of their family going bankrupt (MC). According to SP, many people harbor fears that the renewable energy industry will take away their jobs; they are seeing coal plants close across the state and respond by trying to prevent solar development. Because oil and gas are a major part of Pennsylvania's economy, MO explained that one of the most significant hurdles the environmental movement faces is finding ways to collaborate with labor. Psychologically, people are deeply connected to the fossil fuel industry and in general, interviewees acknowledged the strong role of tradition linked to this sentiment. Many interviewees indicated

that this ideology and its lobbyists are perpetuated by substantial funding and an ingrained mindset that requires defensive responses instead of allowing for more progressive policies.

Even newer industries and supported energy innovations in Pennsylvania are largely tied to the state's history of fossil fuel extraction. For instance, hydrogen hub development is debated by environmental advocates; despite large federal investments in this form of energy, several interviewees have expressed concerns about continued use of natural gas, including the interview excerpt below.

There might be some development, but we think it's very unlikely that these investments are going to have the kind of economic and community transformation that's being promised. So we've been really engaged in that area of work as well as in the petrochemical sector. So you know, continuing to evaluate kind of how the petrochemical industry, like the oil and gas industry, uses these kinds of false economic narratives, to create social capital, to be able to just come in and do whatever the next project is that they have set their sights on (JK).

Psychological barriers

Many people are indifferent or opposed to renewable energy because they do not see these sustainable energy sources as a solution to a problem that affects them directly; as JK said, "I think a lot of people don't want to acknowledge that there's a problem or [believe that since] there isn't a problem for them directly, so they don't need to acknowledge that there's a problem." In other words, a large part of the population considers climate change a distant problem (in terms of time and space) that does not affect them in the here and now. Several interviewees mentioned that Pennsylvanians are often unaware of local climate effects—increased flooding, sustained higher-than-usual temperatures, greater spread of insect-borne diseases—and instead perceive climate change as a problem that affects people in different countries or that may influence residents of their home far in the future. JC explained that without this connection being made in more Pennsylvanians' minds and in a local context, transitioning to a more sustainable future will pose a substantial challenge. DM and MC suggested that increased education and a substantial mindset shift are needed to convince people of local climate impacts and the urgency of implementing local climate solutions in order to mitigate these fundamental psychological reactions.

Furthermore, many interviewees agreed that even with an improved understanding of climate change and renewable energy, people will likely retain their preference for the status quo. For instance, JQ asserted that "...elected officials and their constituents believe [that the economy can thrive with oil and gas], and it's exceedingly difficult to change someone's mind, with facts." As MC and others have explained, the fossil fuel industry has existed for centuries and has provided families with lasting, good-paying jobs. People are more comfortable with an industry they are familiar with than an unknown energy future powered by solar, wind, hydropower, and other, more unconventional sources. They are more comfortable with the current polluting energy industry rather than a new one that requires retraining of workers and investment in unfamiliar technologies. According to the majority of interviewees, how to diminish people's preference for the status quo remains a key question for environmental advocates and is discussed further in the personal and tangible experiences subsection.

Lack of education

Several advocates also identified Pennsylvanians' lack of environmental and renewable energy education as a barrier to progress; many hold outdated notions related to the cost of solar, for example. Residents are wary of investing in solar energy or supporting renewable energy policies because they do not understand "...how good it is for people financially [and] how good it is for the environment" (MC). In many cases, there exists little appetite for improved education or a better understanding of proposed environmental policies. Even when there exists federal or state investments to reduce the costs of renewable energy—such as the Investment Reduction Act—DM explained the challenges of technical issues related to funding and the need to "...make sure it all falls equitably and in the right places." Increased climate change and renewable energy education is necessary in the state's education system; as MC said, "I think that is like there's no good baseline for general renewable education... And I don't know that there's much of an appetite for it in all honesty." Ultimately, "The issue lies in the education, the miscommunication and misinformation, and then the advocacy and really pushing for the solutions that we know that we need to implement" (JC).

However, educating and informing people about environmental topics involves many unique challenges because of the overwhelming amount of media and various messages to which consumers are exposed. Interview participants largely agreed that reaching people and inciting

concern about environmental issues is difficult when many other groups have a similar agenda and use common advocacy and educational techniques, such as social media, webinars, volunteering events, and text banking. Environmental advocates are working diligently to spread their message to members of a busy society who consume so much information daily that rarely does any particular topic affect them. Their work is made even more challenging by the fact that people may not even want to listen to environmental messaging: in climate change discussions, many people shut down due to disinterest and disbelief. In addition to these educational challenges, Pennsylvania's divisive politics also contribute to slow-moving environmental policy change. As JC summarized, "The issue lies in the education, the miscommunication and misinformation."

Political disagreement

Most participants agreed that yet another hurdle to further renewable energy deployment in Pennsylvania and to environmental advocates' success is political disagreement and tension. According to EC, "The political structure not just in Pennsylvania is really skewed in favor of those who have money, have resources, and have tenure and often that means that the folks who are making decisions about policy are not the ones who will feel the impact of those policies, especially when it comes to climate." Pennsylvania remains a "good old boys' network" (JK) in which environmental problem solving (especially by females) is perceived as a challenge to traditional wealth and power. Environmental views are often construed as anti-development, anti-labor, and otherwise disadvantageous for Pennsylvanians. As such, environmental professionals are facing obstacles in their advocacy for a just and equitable renewable energy future. The divisive political system that the research participants are working within is not only a product of Pennsylvania's history, but also its status as a swing state. VL considers Pennsylvania a "...microcosm of the federal conversation when it comes to being a very mixed Republican / Democrat state." Bipartisan support in Pennsylvania is more easily attained on topics such as conservation and waterways protection than clean energy, though, largely due to the state's leading fossil fuel producers, jobs, and donations. Although the labor and environmental movement could collaborate and find common ground in the clean energy industry, historical divisions and misconceptions between these interests are challenging to overcome.

Therefore, even with renewables such as solar becoming more cost effective in Pennsylvania, fossil fuel subsidies and continued political support for the industry is preventing widespread, feasible deployment of these technologies. The Pennsylvania legislature is not prioritizing limiting fossil fuel production and instead increasing renewable energy production; in addition, there exists the challenge of “...dealing with the increasing polarization of the public” (ZB). Many interviewers agreed that people focus on negative stories or beliefs about renewable energy and remain closed minded to new information; labor believes that environmental policies will cause job loss and is disinterested in retraining workers. Moreover, interviewees stated that environmental nonprofits have also had major disagreements on different policies, such as community solar, due to their contrasting backgrounds, audiences, and priorities. Finding common ground between all or some stakeholders will be harder than ever before, but it must be identified and highlighted rather than continuing to focus on disagreement. Few other states have fossil fuel industries as deep-rooted and difficult to dismantle as Pennsylvania, where “...unfortunately. the environment has become a partisan issue, and it really drastically affects the way we're able to push through environmental policy” (JC). As JC further explained, “We’ve got voters who are infamous for splitting the ticket... And the way that plays out is, we just have a lot of different party majorities in different chambers and different levels of government.” However, these massive hurdles have not significantly discouraged this project’s interviewees, but instead inspires them to continue fighting for renewable energy and other climate solutions because these advocates know that their work here is very impactful in altering the US’ effect on climate change.

Environmental nonprofits’ advocacy strategies

Drawing upon personal and tangible experiences

Personal experiences with environmental problems and/or tangible experiences with newer technologies (such as solar panels) are two related and critical ways to garner support for environmental and climate solutions. Learning about why each interviewee became involved in clean energy and clean advocacy was one interesting and relevant way to gain insight into why and how people develop environmental concern. JQ, for instance, observed firsthand that the pollution characterizing her childhood in Pennsylvania was not evident elsewhere and wanted to

create a cleaner environment back home: “I’ve spent a lot of time outdoors, and saw that orange water and black mountains were totally typical. And then, I started traveling out West and realized that not everybody lives this way and this is really interesting.” Similarly, ZB has observed the impacts of Pittsburgh’s air pollution firsthand, which is ranked near the worst in the US, and wanted to address this issue through his career. VL experienced the devastating effects of an oil and gas well pad being constructed in her community without locals’ involvement or representation, so her “...story really started there learning about what was going on in my own community, [then] getting engaged with Moms Clean Air Force as a volunteer.” Additionally, JC was deeply impacted by the Mariner East II’s construction near her home. Both SC and SP were motivated by Al Gore’s climate change messaging and training. Personal stories motivate almost every participant in this research, a fact which can be applied to Pennsylvanian constituents and decision-makers as well: when people have personal and local experiences with the environment, they are more likely to care about environmental protection and climate mitigation efforts. Presenting people with facts has not proven as powerful in raising awareness and creating concern for environmental problems as have personal experiences, tangible change, stories and conversations, and direct involvement.

Many interviewees asserted that one of the most direct and personal ways that people develop environmental concern and interest in solutions is when they feel the consequences of environmental issues. In reference to discussing climate change, JC stated, “you need to talk about how it's affecting people right now, right here in Pennsylvania. And so for a lot of people that's talking about flooding.” When people experience the abstract phenomena they read about—such as extreme weather or energy-related pollution—they see the connection between the cause and effects of crises such as climate change. For instance, pipelines for fracking have been and continue to be built in close proximity to communities, with impacts including pollution, health concerns, damaged aesthetics, and more. After describing residents’ interest in stopping fracking only after the pipelines were being built in their housing development, JQ stated, “I think that is very impactful and it’s kind of a shame that it has to be right in your backyard to change people’s minds.”

Firsthand observations of pollution are also powerful: MO described Earthworks’ use of an optical gas imaging camera to visualize pollution. Providing tours of oil fields and gas patches through the lens of this camera is a “powerful communications and advocacy tool” that

Earthworks uses to demonstrate the need for regulatory policy reform. Their imaging data is useful to increase enforcement of the oil and gas as well as spark the interest of the media and broader community; for instance, scientific data and video footage of plumes reinforces the need for increased setback distances around oil and gas facilities. After seeing and feeling harmful environmental effects, “you can’t really deny that there’s a problem” (MO). The interviewees confirmed that tangible experiences of the effects from the fossil fuel industry leaves a memorable impression on people and is instrumental in driving change.

Furthermore, several participants shared that Pennsylvanians care deeply about their community’s health and the preservation of their recreational areas. As ZB noted, Pennsylvania is known as “a destination for fishing and outdoor recreation.” Across partisan lines, people care about their children’s and loved ones’ well-being when they are outside; they want to ensure that “...their kids are breathing clean air as they’re playing soccer out on the playground” (ZB). Asthma related to air pollution is a more firsthand and relevant problem to many people than the more abstract climate change crisis. Several interviewees also discussed the increase of insect-borne diseases in Pennsylvania. JC stated that Pennsylvania is “the leading state for the number of Lyme disease diagnoses,” a health issue that is worsening with longer, warmer breeding seasons for ticks. Between increased pollution from fossil fuels in communities and recreational areas, more frequent flooding events, longer drought periods, warmer temperatures, and more insect-borne diseases, Pennsylvanians are feeling the effects of climate change. Advocacy centered around environmental solutions related to improving human health is a simpler message that resonates with people and with which Pennsylvanians can agree.

Tangible observations of new technologies, alongside relevant experiences and shared priorities, are another way that people can learn to accept solutions such as clean energy. In other words, the growth of technologies such as residential solar panels and electric vehicles is showing people that an alternative future is possible and is, in fact, already happening. Interviewees concurred that when the solutions are prevalent within peoples’ daily lives rather than distant, they are more open to change and conversations about transitions; they may even become more interested in installing their own solar panels, for example. Similarly, observations of physical, tangible power production (e.g. of rooftop solar panels versus gas being carried from hundreds of miles away) increase trust in its reliability. Another tangible example that ZB provided is that while people in land-locked Pennsylvania may not notice sea level rise, they are

paying higher costs for air conditioning each summer and are interested in mitigating that expense. In addition to financial motivators, Pennsylvanians are more likely to respond to explanations "... about the changing seasons and the booming tick populations like it's a smaller thing compared to sea level rise, but it is something that people are noticing in our region" (ZB).

Yet another way of reaching people personally is through stories and conversations, especially with those they know and trust. MC, who works with residents in solar co-ops, shared that residents are more interested in investing in solar if they know someone who has had a positive experience with solar; similarly, legislators are more likely to be moved by constituents' stories and experiences related to renewable energy/ fossil fuel pollution. She explained that it is "critical to invite [homeowners] into that storytelling process, because that's really meaningful to policymakers." Similarly, SC explained that schools considering going solar are more likely to do so if they hear stories from another school's superintendent or facilities manager who has invested in solar and encourages them to do the same. Engaging in local conversations is also critical to VL's advocacy with Moms Clean Air Force. Her work educating community members on how to become involved and advocate against proposals such as the construction of a new well pad relies upon canvassing neighborhoods, being present at community events, and otherwise having conversations that inform and empower people. In these conversations, VL said that "...it's a continuing conversation of meeting people where they are. I think you always have to sort of understand the newest way people are learning and consuming information... [and] to continue to engage in those ways."

Moreover, direct involvement in environmental solutions is a powerful way to ignite people's interest in a clean energy transition. At a young age, children are likely to become more interested in renewable energy if they examine their school's solar panels during science class. Expanding and promoting the clean energy workforce is one crucial way to galvanize direct involvement, as there are and will be ample clean energy manufacturing jobs. When people work these jobs, SP explained that "...they're part of this new energy economy if they're actively working in it." People are more likely to embrace change if they are working for it, know someone involved, or benefit from it in another way. It is apparent that from the conducted interviews that localizing any issue helps people understand why they should care and support urgent action. In Pennsylvania, selected environmental advocates have, in this research project, identified key ways to motivate action on climate change and clean energy solutions: draw up

people's personal and tangible experiences, explain health impacts, engage through stories and conversations, and advocate for direct involvement with solutions.

Message framing

Alongside drawing upon personal experiences, one of the most effective environmental advocacy strategies for motivating action and concern is to use strategic messaging. In organizing work and sharing messages with people, EC shared that “You can only move at the speed of trust.” Building personal connections and knowing one's audience is crucial for understanding which type of framing of environmental issues will resonate with which stakeholders. While Zoom and other forms of online organizing have allowed environmental advocacy to reach more Pennsylvanians through greater advocacy, environmental professionals often spoke to the importance of creating meaningful relationships within communities. ZB shared that some of his most powerful connections with constituents and stakeholders have been from canvassing and other forms of in-person conversations about environmental health concerns, as this is one message that is important to many groups of people. In agreement, MO said that the health angle “...tends to be less polarizing than some of the others... it's less theoretical... [and] can be more readily understood and accessible for a broader swath of people.” Alongside health, other non-environmental angles have been proven more effective by the interviewees than messaging focused on climate change. Although climate denial is less common now than even a decade ago, climate-centered discussions can cause people to shut down or become overwhelmed. Accordingly, a Vote Solar poll that EC mentioned showed that the messages that garnered the most support for solar in Pennsylvania were health and monetary savings. Advocates generally agreed that people's rationale for supporting clean energy (e.g., economic versus environmental reasons) is negligible as long as sustainable change is being achieved.

Essentially, many interviewees explained that certain words and phrases can antagonize listeners, and successful environmental advocates must be skilled at determining which frames to use in order to find neutral ground with their audience. For example, EC stated that with conservative legislators, discussing the benefits of renewable energy for low-income communities within their district may be more productive than utilizing a climate change angle. Protecting human health and well-being, as VL described, is “...a much more unifying message,

and one that we can really all move to get behind.” Even with those who strongly support natural gas development, conversations could involve placement of pipelines in order to minimize harm to communities; this type of framing could include education on the public health consequences of fossil fuel pollution, the discussion of which could cause future reconsideration of previously held beliefs.

An environmental advocacy approach centered on quality of life-based economic development also offers a vision that many community members understand and support. Any way of finding common ground with those who usually oppose environmental advocates’ messages is critical rather than disregarding legislators or residents with different viewpoints. As EC explained,

“...it's often not the best use of your time to try to convince a climate denier that they need to act on climate. On the other hand, it's perfectly reasonable to talk to a climate denier about energy, independence, and how clean energy contributes to that.”

Along those lines, DM highlighted the importance of knowing one’s audience; for example, he recommended discussing conservation efforts with sportsmen rather than climate mitigation. While advancing clean energy is often a challenging task in Pennsylvania, interviewees agreed that there is the possibility for bipartisanship when framing is carefully chosen.

In discussing environmental problems, many advocates emphasized the necessity of focusing on forward-looking solutions versus telling people about the dangerous consequences of climate change and the need to clean up past pollution. As SC described, “...there's much more momentum and excitement about advocating for clean energy.” People are more enthusiastic about new technology that will lower their electricity costs than about topics such as climate-related disasters and pollution removal; SP shared that young people are especially cognizant of the fact that new technologies like solar are the future.

Regarding message communication, the research participants also gave recommendations for how to keep an audience’s attention and inspire action. DM stated that “...it's imperative of just having a very clear and concise message” to avoid confusion. Furthermore, JC explained three steps to effective environmental communication, which she said is critical to prevent a “doom and gloom” narrative that paralyzes people. Instead, her field coordinators at PennFuture are encouraged to localize issues such as climate change, express the urgency of the problem, and conclude with a strong ask, such as a phone call to an elected official. These three pieces

incentivize people, empower them, and leave no room for doubt regarding the importance of swift action.

To conclude, interviewed environmental advocates broadly agreed that shifting people's worldview around environmental issues and renewables is exceedingly difficult. Instead, their strategic messaging should cater to people's own self-interest and appeal to logic. Advocates could expend much less energy trying to convince people of the threat posed by climate change if they instead employed a health or economic lens. SP mentioned that the PA Solar Center "...rarely talks about the environment at all" but instead encourages individuals and companies to go solar for cost-saving reasons. When lobbying for renewable energy policies and faced with the challenge of Pennsylvania's powerful fossil fuel industry, SP advised addressing the "...economic development opportunities in many different fields to diversify the job opportunities in these communities." Ultimately, the most effective methods identified in this research for challenging the prevailing narrative surrounding climate change and renewable energy is to concentrate on Pennsylvanians' self-interest and how a sustainable energy transition can benefit stakeholders in unique ways. Finding common ground through frames such as equity, economic advantages, and improved health is one such meaningful way to resonate with a larger audience; education is a key tactic often used to support this objective.

Educating

Many environmental nonprofits utilize education as a primary method of connecting with and informing affected citizens about environmental issues and how they can become involved. Moms Clean Air Force, for instance, holds a variety of educational events about the health impacts of living in close proximity to industrial processes. VL emphasized the importance of staying nimble in how she engages with her audience: "I think it's also really important to understand the tools that you're using and how and how those can evolve." During the pandemic, webinars became more commonly used to spread environmental messaging, and now there is a stronger shift back to in-person, on-the-ground educational events. ZB agreed that media and online coverage is a useful tool in reaching large numbers of the public when sharing environmental research, such as the issue of industrial climate pollution. Other nonprofits, like the Ohio River Valley Institute (ORVI), direct their educational efforts around emerging issues and strategies in alternative economic development. ORVI provides information about different

possibilities, such as a future reclamation economy that has a “...tremendous opportunity in creating long-term, high-quality, family-sustaining jobs in abandoned mine land reclamation and oil and gas well plugging (JK).” Furthermore, ORVI holds educational events and community events to share information disseminated in their technical reports. Additionally, Generation180 educates leaders in schools about the benefits of investing in solar energy, Vote Solar gives educational presentations about community solar, and Solar United Neighbors holds Solar 101 sessions to inform interested members of the public about residential solar power and relevant solar policy.

Nonprofits’ educational efforts in advocating for clean energy are geared not only toward the public but also towards the legislature and other entities. JQ spoke about writing position papers and letters that the Pennsylvania Sierra Club distributes to legislators and committee members directly to promote environmentally friendly policies. On the technical side, SP said that the PA Solar Center educates nonprofits, schools, municipalities, and businesses about solar and offers “...unbiased technical assistance to help them understand what their ability to go solar is, and then walking them through, understanding what the finances might look like to putting that out to a bid in an RFP (request for proposal) to get solar developers.” By providing trusted information in a way that the general public can understand, environmental nonprofits serve an important educational role. Crucial to remember is that a large part of education surrounding environmental issues to any audience is to break down scientific and often complicated information in a digestible way so that people can understand and engage on the issue. Much of the happenings in Harrisburg are complex and may not reach the “kitchen table” of the average Pennsylvanian (JC). As such, advocacy organizations play both a “listening and an educating role” (JC) in order to connect the legislature with community members. By informing the public, correcting misconceptions, and engaging with community members in relevant ways, the interviewed environmental advocates have and continue to increase support for clean energy.

Working in coalitions

Another common theme throughout the interviews was the importance of working in coalitions and collaborating with a variety of stakeholders. Different groups have contrasting strengths and can assist each other in achieving common goals. For instance, the Ohio River Valley Institute focuses on producing technical information, Moms Clean Air Force is more

involved with the public, the PA Solar Center provides technical assistance, and other organizations fulfill different niche roles. RA explained that in the most effective coalitions, members do not always agree and may not share the same skill set. Pennsylvania's environmental community offers the diversity crucial to coalitions' success and together have a very large audience. When environmental groups align on a messaging effort, for instance, they can reach many more people through their combined efforts; for instance, MC said that "when that [coalition] comes together, I think it has a much greater impact to somebody who's like reading this letter, or you know, seeing the policies that we do support, they'll take it a little bit more seriously because it's not just one group." These groups often work together on political efforts, including lobbying and litigation; as a coalition, their voices are stronger, better informed, and more likely to have a greater impact. In addition, many interviewees said that environmental coalitions help one another through information sharing about news, policy analysis, successful strategies, and much more. These groups work in coalitions on the local, state, and federal levels, thus amplifying their efforts and successes on a variety of environmental priorities.

Building cross-sectoral relationships and coalitions is just as critical as collaborative efforts between environmental groups. Clean energy advocates often work with those in the clean energy industry, labor, academics, philanthropists, and community groups. In particular, JQ identifies the conflict between labor and the environmental movement as one that is currently tense but could be improved through finding common ground: "I would hope that we could work to build better relationships with labor in this transition with clean energy, because right now we're fighting and it's not helping anyone." As for the government, MC's solar work often aligns with that of local and municipal officials, who are interested in helping their residents save money on energy. On broader, state-wide issues, legislators are more likely to respond to policy solutions and other proposals shared by coalitions instead of those of a single organization. Donors are another key group that environmental advocates must work with to achieve their goals, as many nonprofit organizations are "directly dependent on philanthropy for sustaining our work" (JK).

In the future, MC foresees that "...there is going to need to be more willingness to work with outside groups, even outside of nonprofits. I think that there is a lot of room for labor unions, schools, and churches to find a place with this group, especially if community solar

passes.” JC spoke about the importance of environmental groups working with organizations representing intersectional issues, such as human rights nonprofits, “...especially when it comes to making sure we're pushing for equitable solutions for Pennsylvania.” There are ample opportunities for environmental justice collaborative efforts and to support the work of intersectional organizations when working toward clean energy and more comprehensive equitable solutions in Pennsylvania. More traditionally conservative groups can also play a valuable role in environmental coalitions as bipartisan cooperation is necessary for the realization of a sustainable energy transition in Pennsylvania. Through finding common ground, EC stated that “there's still a lot of value in working with conservatives.” Coalitions involving a larger, more diverse number of stakeholders are a powerful tool used by the participating environmental advocates in advancing clean energy.

Leveraging money and resources

The fossil fuel industry’s wealth and influence are well known in Pennsylvania and, as mentioned, poses a daunting threat for clean energy advocates. Industrial companies exert significant power in the state legislature, according to JQ, because they have a lot of money to invest in political candidates supportive of fossil fuels, and “unfortunately money is a huge part of political success” (JQ). The fossil fuel industry also benefits from party leadership’s investment as well as other outside supporters; additionally, they continue to benefit from tax incentives and uniform environmental regulations. The Pennsylvania state government dedicates “...3.8 billion dollars in fossil fuel subsidies every year. So, it is hard to envision a world where we're going to get away from that so quickly” (JC). While companies related to the fracking industry have ample wealth to “buy access and to buy influence,” environmental groups typically do not have sufficient funds to even the playing field in this regard (ZB).

On the other hand, many philanthropists financially support the work of environmental organizations, and the economic argument for renewables is strengthening rapidly. To begin, JK said that philanthropists sustain the work of organizations such as ORVI and play a key role as both a supportive and involved stakeholder in environmental issues. Government investment in environmental efforts such as clean energy are only growing and contributing to the lower costs of renewables. Federal investments such as the Inflation Reduction Act (IRA) and the Infrastructure Investment and Jobs Act (IIJA) are greatly increasing the affordability of solar

energy, which EC predicts will result in a rapid growth of the solar industry. DM agrees, saying that this funding is a "...once in a lifetime thing... unless the stars align in another 30 years. I mean, this is the right amount of money at the right time." The IRA has allowed individuals and homeowners to incentivize clean energy on a local level, allowing for progress that JC is especially excited about.

In her work with solar, MC also shared that lessening renewable costs are increasingly appealing to homeowners frustrated with the rising cost of fossil fuel derived electricity; solar is also growing because of its reliability and consistency. SP added that "... there's such an opportunity here in the clean energy supply chain that if we really looked at it strategically, we could build this out in Pennsylvania," Besides the growing financial incentives to invest in renewables, more funders are willing to support equity work to ensure that the benefits of renewable energy are distributed fairly to low-income communities. Slowly but surely, interviewees concurred that more money is being directed toward environmental nonprofits, renewable energy incentives, and ensuring that these benefits are equitable. Leveraging these investments and educating Pennsylvanians about the cost-saving opportunities they provide are other effective tools that can boost clean energy advocates' efforts.

Encouraging community involvement

Alongside leveraging financial resources, environmental professionals stressed the value of building community relationships and encouraging constituent involvement in clean energy advocacy. Interviewees discussed empowering volunteers and other environmental partners, inspiring constituent action, and supporting environmental justice communities. JC mentioned that a PennFuture field coordinator's work typically involves a variety of efforts "...geared towards deepening relationships with community partners and our membership and volunteers to help them build affinity to our organization and the movement at large." These activities may involve attending community events, sending out newsletters, inviting locals to legislative meetings, and others that garner local environmental support. JQ also relayed the importance of volunteers in driving the Sierra Club's work; "...touching base with our volunteer leaders and keeping them informed with a variety of things" is a key aspect of her work. According to JQ, this informational flow is critical to maintaining an active group of constituents willing to take action on clean energy legislation. Other community partners are essential to the success of Solar

United Neighbors' (SUN) solar co-ops. MC explained that community partners, such as local government leaders and other nonprofits, are beneficial for the promotion of a solar co-op in a new area because they lend credibility to SUN's efforts. In addition, she leads a volunteer solar policy action team that supports SUN's work on solar policy. Ultimately, as ZB stated, environmentalists should align not only with other environmental groups to be effective but also "...bring in all the other people who share [priorities] whether it's faith groups, or interest groups like hobby groups or civic organizations."

Approaching constituents and encouraging them to become involved in political lobbying is a critical way that interviewees recommend to make a meaningful impact on lawmakers. As RA said, "Some representatives will change their minds [regarding clean energy policies] if someone in their district likes it." Without pushback from the public, legislators will be even more inclined to allow the status quo of energy production to continue. Diverse constituencies across the state may care about different energy issues, which, according to EC, can often be addressed by making clean energy more affordable and accessible. To spark public engagement, JQ shared that the Sierra Club utilizes action alerts, emails, phone banking, social media posts, and more to educate and encourage constituents to reach out to their legislator. For example, elected officials have reached out to the Sierra Club about issues they have realized are important after receiving many constituent phone calls. DM agreed that phone banking is a concise way to raise awareness quickly, which is crucial due to the fast-paced nature of advocacy. These officials are even more likely to respond to constituent actions higher up on the "hierarchy" of influence: it is more impactful when constituents take the time for a meeting with their legislator or even write a personalized email. Constituent messages and demands resonate more strongly than those of an environmental lobbyist, as they are more difficult to dismiss. PennEnvironment similarly focuses on direct advocacy work. ZB discussed his organization's upcoming annual Climate Action Lobby Day, during which hundreds of Pennsylvanians meet virtually with their elected officials. Notably, ZB and VL emphasized that there is a "spectrum of engagement" (ZB) that often depends on people's time and availability; quicker actions such as signing a petition or donating should be just as encouraged and appreciated as attending a meeting. By giving constituents multiple opportunities for engagement, they are more likely to become involved and want to take future action. VL noted, Moms Clean Air Force "...works to understand and accept our action takers where they are. So we get as moms that life is complicated and busy and crazy.

And we will take any version of action that we can get.” and JC agreed that “volunteering itself is a privilege... [so] you always want to make sure you’re providing accessible and varied opportunities for people to get involved.” Also important is what ZB describes as the value of knowing the audience who can be rapidly mobilized to respond when there is limited time to engage on an issue.

Constituents’ efforts can be greatly augmented by education and other resources provided by environmental nonprofits. JK explained that ORVI creates “...collateral materials to support our research. So that if you're a community member and you want to take one of our reports to a meeting with your township supervisors... We provide summary documents, talking points, documents, [and] digital tool kits that really can help people translate the often too dense and long reports [so] that they [are] more accessible.” Through attending school board meetings and educating students, SC and her organization, Generation180, have similarly supported students in advocating for rooftop solar investments at their schools.

Another way to increase the likelihood of action taking is simply to provide a strong ask; if someone is strongly motivated through an urgent, localized message, they are more likely to agree to volunteer or contact their elected official (JC). Through a clear and urgent action, constituents can be empowered by “express[ing] to folks why this is an action they need to take now and then” (JC). Empowering Pennsylvanians and showing them how to utilize advocacy for change they want to see in their community is a vital and effective tool employed by the interviewed clean energy advocates.

In addition to empowering communities, listening to local needs and understanding how to transition to a clean energy powered future is a principal goal of many advocates focused on expanding environmental justice. Vote Solar concentrates most of their efforts on building relationships with frontline communities, including those “...who will be most impacted by climate change, and those who have historically borne the heaviest burden of our extractive energy system” (EC). An important point to remember about work such as EC’s engagements with frontline communities is that they have numerous other priorities: they are under-resourced and often environmental concerns are not at the forefront of community members’ minds. EC also emphasized how essential rebuilding trust is as many frontline groups have historically been abandoned and “relegated to sacrifice zones” both in terms of pollution and politically. She aims to demonstrate her desire to interact with a community and develop trust over time, which is a

long process but crucial to increase representation and equity in the clean energy transition. One such way that EC engages with environmental justice communities in Pennsylvania on clean energy issues is asking them for their input on policies such as community solar, including their interest levels and energy priorities. School districts offer Generation180 an avenue to connect with and help low-income districts reap the benefits of solar energy and educate their students on environmental solutions. As for organizations like ORVI, much of their research is community directed, meaning that a community member or organization will identify a gap or research question to which ORVI responds. JK spoke to the role nonprofits play in helping to represent the public interest, adding that there is "...a big opportunity for the nonprofit sector to try to do more bridge building and sort of create less politicized campaigns. And more [work] grounding things in collective community need." In summary, environmental injustices disproportionately impact low-income communities of color, and building relationships as well as "...partnerships are incredibly important, especially when it comes to making sure we're pushing for equitable solutions for Pennsylvania" (JC).

Policy analysis and lobbying

A large part of the interviewed environmental advocates' work consists of examining relevant policies, recommending changes to proposed policies, and lobbying against environmentally unfriendly legislation. This part of advocacy involves reading of proposed legislation and comments, assessing statements by environmental opponents, and aiming to identify problems before they worsen (RA). Hydrogen is one such issue that environmentalists are working to get ahead of before it gains further traction: through researching and educating about this energy form, advocates strive to correct misinformation. Oftentimes, policy research and analysis tasks "...ebb and flow with the season calendar... when session is happening... it's sort of more like a fire drill and then you are, you know, in the Capitol meeting with people, bumping with people, just trying to gather" (JQ). During the legislative session, there are a lot of environmentally related proposed policies and regulations, including many rumors, and advocates are often tasked with sifting through information to identify facts and keep their volunteers and partners updated. Engaging with regulatory decisions, such as public utility commissions, is also crucial because of the significant influence regulations exert; EC emphasized the need to make regulatory procedures and languages less exclusive. As JC stated,

part of field coordinators' jobs is "reading the local news, getting a good understanding of what has come out lately about environmental issues." Research is also significant to the organizing efforts of other groups such as Vote Solar; EC explained that Vote Solar often conducts polling research to find out which angles make people more responsive to environmental advocacy, and ORVI's research is centered around providing analysis to support sustainable economic development (JK).

Environmental nonprofits' research is often organized around policy priorities, which shift rapidly as new developments occur across the state. The interviewees in this research project identified some of their current priorities related to renewable energy: community solar, the Alternative Energy Portfolio Standards (AEPS), air pollution regulations, oil and gas bonding, hydrogen hub development, and improved solar energy management as more comes on the grid. As DM stated, emphasizing climate and energy policy is particularly important because these topics greatly affect other environmental priorities, including biodiversity and conservation. EC spoke to the importance of advocating for equity components in community solar legislation: "...we want to focus on building relationships with frontline groups and doing what we can to help them engage, if they want to, in the community solar conversation." Updating the AEPS, which requires an increasing percentage of renewable energy-derived electricity to be sold to customers annually, is a more partisan policy issue than community solar, making it more difficult to build support (SP). VL's policy work on the federal level has recently involved advocacy for stricter mercury and particulate matter pollution standards as well as for Pennsylvania joining the Regional Greenhouse Gas Initiative. Along the lines of regulating the fossil fuel industry, Earthworks and the Sierra Club are part of a coalition advocating for stricter bonding levels, defined as the amount of money required to be available when someone drills a well to ensure it is plugged at the end of its lifespan. Earthworks prioritizes "... exposing the problem of the oil and gas side of things... to be able to advocate for a shift to clean energy, to move away from fossil fuels" (MO).

Moreover, hydrogen hub development is a priority for many organizations involved in this thesis as it can be utilized as a front to maintain the strength of fossil fuels: fracked gas is used to create "blue" hydrogen, which is considered clean because its carbon emissions are sequestered. In JK's policy role with ORVI, she provided expert testimony on hydrogen hubs before the House Environmental Resources and Energy Committee. Looking toward the future,

SP described the increasing requests for solar assistance that the PA Solar Center has received, indicating a need for strategic policy regarding solar management in the electricity grid. As JC articulated, advocacy groups are critical to hold people accountable, pay attention to the influx of bills introduced weekly, and make legislative updates accessible to the public. Going forward, she said, "...environmental advocacy organizations need to continue to be vigilant and fight back against some of the worst proposals, and really try to put forward some forward-thinking solutions that we can get behind" (JC).

JQ shared that part of her political work is supporting good environmental candidates, because "We can't get better policies if we don't get people who care about climate and clean energy." The Sierra Club terms these environmentally supportive legislators "environmental champions," who are identified annually through their environmental scorecard, a measurement that communicates to constituents how their elected officials vote. Electing an environmental champion requires a winnable district as well as a "good candidate who's willing to do the work," which often involves likability, willingness to fundraise, and dedication to working hard (JQ). Unfortunately, as EC stated, many lawmakers who are receptive to hearing community priorities about clean energy are often those with a more progressive reputation, which in Pennsylvania means that the bills they champion are less likely to move. With her work at Conservation Voters of PA, JC aims to hold moderate legislators accountable, help elect someone when needed, and organize politically. While electing environmental champions is a challenging process, ZB offered some hope: "we're seeing more and more support for the environment at the polls... in the halls of power." Looking toward the future, MO predicted more investment and lobbying by 501(c)(4) organizations such as the Earthworks Action Fund to increase the number of environmentally supportive legislators.

The future of clean energy advocacy in Pennsylvania

As the goal of this research is to provide insight into clean energy advocacy for current and future environmentalists, the final question asked in each interview was "How do you see the role of nonprofit environmental organizations in clean energy advocacy evolving in Pennsylvania's future?" Interviewees were asked to interpret this question in a timeline that made sense to them, and answers ranged from considering the near future to decades ahead. Most expressed was the sentiment that urgent action and advocacy is necessary now to achieve a

potential future in which clean energy and a healthy environment are normalized. SC expressed “...we're gonna have to push really hard especially in those next few years leading up to 2030 and hopefully, we just build more coalitions to change policy.” JC agreed that building “people power” is critical in moving environmental solutions forward, especially on a local level through municipal climate action plans. Both MO and MC emphasized the need to find overlap with additional groups that may not fall under the umbrella of environmentalism, such as labor or health care groups. Unifying under intersectional issues is critical to managing the decline of oil and gas and moving toward an equitable clean energy future.

On an optimistic note, a few participants were hopeful about the increasing support and financial support for renewable energy and predicted more favorable clean energy policies in the future. As EC said, “Solar was becoming increasingly affordable even before the Inflation Reduction Act, and that's just going to catapult it,” and MC said that the proposed Solar for Schools bill is a promising policy that could help make solar more visible. Moreover, RA said that he is encouraged by the growing number of young people involved in the environmental movement, and JQ feels hopeful about the increasing progressive block in Pennsylvania. JQ said that she hopes the future holds stronger environmental justice policies and greater collaborations with labor interests. Like other interviewees, ZB explained that most of his work with PennEnvironment has been defensive, but he hopes that “...we'll continue on in this direction and have more opportunities to actually move forward, tangible, meaningful, proactive policy to tackle some of these problems.” To achieve progress DM emphasized the importance of environmental nonprofits rallying behind “smart and pragmatic solutions for Pennsylvania” and minimizing disagreement over policy nuances. JK suggested reaching agreement through grounding advocacy efforts in “collective community need.” Using the various tactics discussed above, environmentalists will continue their clean energy advocacy to unify a polarized public and accelerate a sustainable future.

Discussion

Ultimately, nonprofits play a crucial role in advocacy in general; these organizations strive to advance what they consider best for the public interest (Anheier, 2014). Nonprofit organizations drive change in various issue areas through policy advocacy, public education, lobbying, capacity building, and many other actions (Keck and Sikkink, 1998). In this thesis, the 12 interviews summarized above illustrate the role of environmental nonprofits in increasing support for clean energy, viewed by many as a public good. The interview results sufficiently answer the research questions, which were outlined previously:

- What are the most effective strategies in clean energy advocacy used by environmental nonprofits in Pennsylvania, in the experience of interviewed professionals?
- What challenges do nonprofits face in clean energy advocacy, and what tools can be used to overcome them?
- What recommendations do experienced professionals have for others working to advance clean energy?

Effective strategies and challenges in clean energy advocacy have been identified in both the literature review and interview results sections. A variety of tactics (e.g., petitions, meetings with policymakers, educational events, letters to the editors, et cetera) are used by interviewees which are employed strategically and with appropriate issue framing. As discussed, societal perceptions of clean energy pose a significant barrier to advocating for relevant policies as many Americans lack education regarding renewable energy (Nasirov et al., 2015). The interview results confirmed this issue as well as their resistance to change and their well-established beliefs in consumption and freedom. Other challenges include Pennsylvania's history of extraction, psychological barriers, and political disagreement. One of the most successful ways to combat these beliefs against renewable energy was examined in the literature review and was mentioned throughout the interviews: using localized messaging with a rationale for urgency and a strongly suggested action is crucial (Sovacool, 2009). Helping people connect environmental issues with effects happening in their personal lives is a meaningful way to increase their concern (Anspach and Draguljic, 2019). Overall, five key recommendations emerged both from the literature

review and interviews that may benefit environmental advocates in Pennsylvania in their continued clean energy advocacy.

Recommendations

1. Utilize strategic messaging to cater environmental issues and solutions to people's self-interest.

Employing different frames, or focuses used in strategic messaging, is crucial when discussing a sensitive topic such as clean energy with diverse audiences. For one, the health benefits of renewable energy—such as cleaner air and water—were identified in this research as appealing to many. Other audiences may be more inclined to support renewable energy for economic reasons, such as lower energy costs over time, or even safety concerns, because renewable energy is in fact a reliable and long-standing technology (Kotcher et al., 2021; Sovacool, 2009). In addition to knowing how to engage their audience, JC recommends that environmental advocates include both a proposed solution and a strong call to action in renewable energy campaigns. For example, this technique could involve presenting stakeholders with a plan for investing in affordable rooftop solar (solution) and a request to attending a community meeting (call to action). Most importantly, environmentalists should seek to unite Pennsylvanians over shared values—such as protecting children's health and a prosperous economy—and provide their audiences with clear action steps.

2. Build relationships with communities through education, local engagement, and lobbying efforts.

Many interviewees spoke to the importance of direct engagement with local communities, especially those most affected by environmental problems. By attending community events and asking residents what their energy priorities are, advocates generate increased trust and support the advancement of clean energy equity. Listening to people's stories and providing opportunities for them to share their experiences, including with lawmakers, is just as important as supplying information and hosting environmental education events. Advocates often serve a connecting role between government and communities, allowing them to empower Pennsylvanians to become involved in driving change and determining relevant lobbying priorities. Relationship building with community members is critical to increasing their support of clean energy and meeting their environmental health needs; along those lines, connecting with other stakeholders through coalitions is necessary to achieve a greater impact.

3. Work in coalitions with a diverse group of stakeholders through finding common ground.

Coalition building is important to further engage diverse groups and maximize the influence and reach of environmental nonprofits (Hess and Gentry, 2019). Together, environmental, labor, community, and other special interest groups can combine knowledge and resources to most effectively sway constituents and legislators alike. Combining different groups' niche strengths such as researching, organizing, litigating, educating, providing technical assistance, and more, can reach and benefit a much greater number of Pennsylvanians than any individual organization could. To conclude, many research participants highlighted the need for coalition members to remain focused on attaining common, intersectional goals, such as increased equitable renewable energy deployment, rather than becoming divided over policy nuances and other smaller disagreements.

4. Leverage growing interest in and funding for the environmental movement.

Many interviewees were optimistic as they described the growth in funding devoted to incentivizing renewable energy on residential, commercial, and utility levels. Policy-based investment in renewable energy through the existing IRA and IIJA, an increased AEPS, the passage of community solar, and other legislation creates more affordable consumption of renewable energy. Financial savings have also been shown through this research as a way to spark interest in renewables (Bayulgen, 2020). Public interest in renewables is also increasing as environmental education opportunities are expanding, people are seeing more renewable energy technology in their daily lives, and knowledge of corresponding health and financial benefits is more widespread (EIA, 2023; Kotcher et al., 2021; Bayulgen, 2020). Consequently, environmental advocates should capitalize on this growing opportunity to invest in clean energy through continued education about benefits and strong lobbying efforts.

5. Stay informed and nimble in research, policy analysis, and lobbying.

Clean energy policy is quickly evolving, and the Pennsylvania legislature is frequently considering new bills and issues. Thus, environmental advocates involved in the policy world must stay updated, sort through misinformation, and educate their coalitions, volunteers, and members. In addition, advocates should consistently lobby for clean energy policy priorities and

against bills that would further the influence of the fossil fuel industry. One of the best proactive ways to do so is to support the election of environmental champions through focused lobbying in key districts. As this work is fast-paced and challenging, involving coalition members and volunteers' help is recommended.

While this study and its recommendations are hopefully productive for environmental nonprofits in Pennsylvania, there is ample opportunity for continued research and a wider scope of analysis. To generate additional and more thorough results, a greater number of research participants in a broader array of fields could be involved. Moreover, analysis could be improved through not only more in-depth interview-based study but also examination of organizations' structure, strategic planning, relevant documents, and interactions between staff. A more holistic understanding of the role of nonprofits in clean energy advocacy could also be gleaned from interviewing other stakeholders, including government leaders, community-based organizations, Pennsylvania residents, utilities, and educators. The scale of this research could also be extended to include analysis of clean energy advocacy and technological progress in other US states and even other countries. For instance, Iceland's success in the deployment of renewable energy exists in a much different context than the US, but beneficial comparisons and recommendations can still be drawn. In sum, there is ample opportunity to continue the study of how and why different stakeholders develop support for renewable energy, which could further the impact of environmental advocacy.

Conclusion

The primary aim of this thesis was to analyze and synthesize advocacy strategies identified by interviewed environmental professionals as effective in increasing support for clean energy investment and widespread use. In Pennsylvania, abundant challenges have inhibited the growth and acceptance of renewable energy technologies, including solar, wind, and hydroelectric power; political disagreement, an extractive history, and psychological barriers are the most daunting. Yet environmental nonprofits have already come a long way in overcoming the public good dilemma posed by renewable energy supply in a fossil fuel dominant state. Through strategic messaging, reinforcing personal and tangible experiences, becoming involved with communities, informing and educating, leveraging federal funding and other resources, and lobbying for policies that incentivize clean energy, environmental advocates have appealed to Pennsylvanians with diverse interests and opinions on clean energy. Nonprofits, at their core, serve to bridge communities with the elected leaders who govern them. They aim to secure public goods in attempting to best meet the public interest. As these organizations operate voluntarily, without earning profit, they are often highly trusted to act not in self-interest but for the good of those they serve and of future generations. In the case of clean energy deployment in Pennsylvania, environmental advocates are not only acting for the sake of the environment, but to preserve a healthy, safe, sustainable world. Clearly, shifting from fossil fuels to renewables must become a more urgent priority in Pennsylvania; hopefully, this thesis has shed light on how to increase support for and depoliticize clean energy through strategic advocacy.

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