The Resistance Dilemma: How Resistance to Renewable Energy Infrastructure is Frustrating Climate Solutions

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Addressing the climate crisis involves a rapid phase-out of carbon emitting fossil fuels and an accelerated adoption of clean energy technologies. Environmentalists and Indigenous groups have focused much of their attention on resisting new fossil fuel infrastructure such as coal-fired power plants, oil and gas pipelines, and fracking (Hoberg 2018a). This paper explores the question of whether the relative success of this "keep it in the ground" movement is, paradoxically, a significant risk to the necessary clean energy transition.

Many renewable energy generation and transmission facilities have confronted stubborn opposition from local groups. Solar and wind power projects, vital to replacing fossil fuel for electricity generation, have generated controversy from local groups concerned about property values, changes to species habitats, landscapes, aesthetics, and human health. New high-voltage electric transmission lines have also attracted significant resistance. Renewable energy projects are frequently in quite different locations than fossil fuel infrastructure, so new transmissions lines are usually required to supplement the build-out of new renewable energy sources. In addition, the integration of intermittent renewables into the electricity grid is projected to require significant new transmission capacity and deeper integration across larger geographical areas.

After an elaboration of the analytical framework to address the relative social acceptance of projects, the paper address conflicts over wind power projects in central Canada and New England, solar power projects in California, and transmission line projects within California and between Quebec and New England states. The paper will examine what motivated resistance campaigns and how much impact they have had in thwarting or altering proposed renewable power projects or transmission lines. Most of this analysis will be based on a review of published literature and government documents. This paper will examine what motivated resistance campaigns and how much impact they have had in thwarting or altering proposed renewable power infrastructure projects.

1. Analytical Framework

This paper expands of a framework originally developed to analyze the relative influence of place-based resistance to oil pipelines (Hoberg 2013). That work argued that, in the case of oil pipelines at least, it is most useful to think about the relative power of project opponents as a function of four variables:

1. Whether opposition groups have access to institutional veto points;
2. Whether the project can take advantage of existing infrastructure;
3. The salience of place-based, concentrated risks and benefits;
4. The geographical separation of risks and benefits.

Are these same four factors at work in the case of clean energy infrastructure? For the first three factors, the answer is a definite yes. With respect to the accessibility of institutional veto points, the rules and decision-making structures surrounding clean energy projects are critically important. Indeed, as we'll see in Ontario wind case, one of the most important institutional conflicts over renewable energy projects has been whether local governments, who are

understandably likely to be concerned about localized project impacts, have the ability to block projects through zoning or other policies. Secondly, like pipelines, if renewable energy projects can take advantage of existing infrastructure, their visual and landscape impacts are likely to be less. New powerlines, for example, are much less likely to attract strong resistance if they can take advantage of existing powerline rights of way. Whether renewable projects pose risks to salient, place-based values is also very relevant to the magnitude and intensity of opposition they could activate. Much of the controversy of wind and transmission lines is precisely about how they would alter places valued by communities. Solar and wind plants have also generated opposition because of sensitive ecological habitats.

The application of the fourth factor, the geographical separation of risks and benefits, is a more complex but important feature of the project's politics. Many renewable energy projects create the potential to site them in proximity to where the power will be used, which would concentrate the risks and benefits in the same place. But the desire to take advantage of the most favourable locations for renewable generation means that they are often distant from the source of demand, which creates a clear and potentially divisive separation of risks and benefits (get source – probs in transmission stuff). Transmission line are essentially pipelines for electrons. Their risks to water and land are much less, but their aesthetic impacts, if built above ground, are typically much greater. Like oil pipelines, transmission lines are long, thin, linear projects that therefore affect a number of communities and potentially different subnational or even national jurisdictions. In many cases, transmissions lines have attracted more resistance than new renewable power facilities themselves. So indeed, all four of these factors are also very important in determining the strength of resistance to renewable energy infrastructure.

2. Literature on social acceptance of renewables

Widespread resistance has spawned a substantial literature on the social acceptance of renewable energy (e.g. Wustenhagen et al 2007; Cleland et al. 2016; Batel et al 2013; Devine-Wright 2009; Fast 2013). One pervasive theme is the importance of local values. Most scholars writing in the field reject the "not in my backyard" framing of placed-based opposition, insisting instead on the imperative respecting the attachment of people to place (Devine-Wright et al 2016; Fast et al 2016; Sovacool and Ratan 2012; Hyland and Bertsch 2018). One systematic review of the literature concludes that "local communities may be more willing to accept projects if developers site and design them in ways that work with, rather than against local identities and people's attachment to specific places" (Devine-Wright et al 2016, 5).

Another virtually universal theme throughout the social acceptance literature is an emphasis on engaging host communities early and meaningfully in the process, and demonstrating how community input influenced project design (Devine-Wright et al, 2016; Fast et al 2016). Failure to do so frequently leads to "public enquiry, prolonged planning delays, additional expense, and local community distrust in network organisations" (Cotton & Devine-Wright 2012). Cotton and Devine-Wright (2013) are that "stronger collaborative or partnership planning approaches, devolved power arrangements and stronger local community scrutiny of developer applications are justified, both on ethical grounds to support procedural justice, and on strategic grounds to ameliorate public opposition and the risk of planning failure."

A third theme in the social acceptance of renewables literature is the importance of providing economic benefits to those affected by the project. Some studies emphasize the importance of community ownership or shared ownership in fostering public acceptance (Cleland et al. 2016; Devine-Wright et al 2016). Others find that local economic benefit are more important than actual ownership per se (Hyland and Bertsch 2018). Regardless, there is a general consensus that some form of substantial community benefit is essential. All three of these themes are apparent in the following case studies of resistance to renewable energy infrastructure.

3. Conflicts over Wind Power in Ontario

Ontario Decarbonization Policy

In Canada, the most significant resistance to renewable energy infrastructure has been to wind power in Ontario. Beginning in 2004, the government of Ontario, controlled by the Ontario Liberal Party under Premier Dalton McGuinty, undertook a bold decarbonization initiative to phasing coal-fired electricity generation, which in that year made up about one-first of the province's electricity supply. To diversify its low-carbon supply mix, Ontario initiated a feed-in tariff program in 2006, offering a guaranteed price for hydro, wind, solar, and biomass facilities for a 20-year contract. The province became more ambitious in 2009, when the McGuinty government enacted the Green Energy and Green Economy Act (hereafter the Green Energy Act).

The Green Energy Act expanded the feed-in-tariff program. In addition to increasing the subsidized rates, the Green Energy Act made a number of other changes designed to reduce barriers to rapid renewable energy development. Local transmission companies were required to connect renewable projects to the grid and grant them priority access (Fast et al., 2016; Loudermilk, 2016).[1] In order to expedite approvals and installation, the Renewable Energy Approval process was created with the goal to have decisions within six months of project submission. Approved projects would be entitled to certain exemptions from the Environmental Protection Act and Ontario Water Resources Act permit requirements. Modest community consultation requirements were also included (Walker, 2010).

Most controversially, the province also amended the Planning Act to remove direct control over land use decisions from municipal governments (Fast and Mabee 2015; Fast et al., 2016). In a speech to the London Chamber of Commerce, Premier McGuinty justified the change with the need to avoid the "not-in-my-backyard" syndrome thwarting renewable energy development:

> We're going to find a way through this new legislation to make it perfectly clear that NIMBYism will no longer prevail when it comes to putting up wind turbines, solar

[1] The FIT included domestic content provisions, or "buy local" rules in an effort to tie renewable energy production to provincial economic growth in green manufacturing (Walker, 2010). For wind projects, this was initially stipulated at 25%. The "buy local" provisions of the Green Energy Act were changed in 2012 after a World Trade Organization dispute was launched by Japan, the U.S. and the E.U. The government attempted to appeal but was denied, causing the buy local provisions to be rescinded (Hill, 2017).

> panels and bio-fuel plants…Our new law will uphold rigorous safety and environmental standards, but once those standards have been met, we intend to assert the greater public interest in clean, green electricity and the jobs that come with it. Municipalities will no longer be able to reject wind turbines, solar panels or bio-fuel plants because they don't like them. We can't allow interests to oppose these simply because they don't like them (Canadian Press 2009).

At the time, these changes were enormously popular with the public. A poll shortly before the Green Energy Act was enacted showed 87% of respondents approved of the proposed Act. Support was even high in which resistance to wind power had been reported as a result of projects proposed under the 2006 policy (CNW 2009).

The Rise of Resistance to Wind Power

As communities learned about proposed wind projects, however, "a fierce and well-organized backlash" emerged (Mulvihill et al 2013, p. 10). Not all rural residents in areas where projects were proposed were opposed to them. Many residents with either neutral towards the projects or supportive, seeing their 'green' development attributes as consistent with their rural lifestyle and promoting livelihoods (Fast, Mabee, & Blair, 2015). But intense, organized, and vocal opposition also emerged. By 2011, local wind-resistance groups had emerged in every provincial electoral district with a wind turbine (Stokes 2015). Wind Concerns Ontario was created as a coalition of community groups, and by 2011 had 50 local chapters (Stokes 2013). The groups were successful at mobilizing municipal politicians. By 2011, 78 municipalities passed resolutions against wind turbines (Stokes 2015).

Opposition resulted from a combination of concerns. One significant trigger was visual and cultural: to many in rural residents, wind turbines reflected an industrialization of the landscape that was anathema to their sense of place (Fast and Mabee 2015). Second, there were also more pecuniary concerns about property values. A 2013-2014 study found a significant reduction in housing prices within 5 kilometres of turbine sites in two communities with turbines along Lake Ontario, but interestingly not within 1 kilometre. Properties closer to the turbines may have lease agreements with developers, so would benefit financially in a way that more distant properties wouldn't (Fast et al., 2015; Christidis & Law, 2012).

Third, human health concerns has been one of the biggest issues in the Ontario conflict. "Wind turbine syndrome," as it came to be called, emerged as nearby residents reported concerns with sleep interruption, headaches, fatigue, dizziness, ear irritation, concentration problems, and irritability. Wind opponents argued these impacts were the result of a combination of mild noise (a whirring sound from turbine blade movements), vibrations, and visual light flickering based on sun position and shadow effects. Health criticisms have persisted despite the absence of any credible evidence linking proximity to wind turbines with any physical ailments (Christidis & Law, 2012; Knopper & Ollson, 2011). In 2010, the Ontario Chief Medical Officer of Health published a comprehensive review of the evidence. The report reinforced that no known links exist between wind turbine noise and sleep issues, dizziness, or headaches existed, but did acknowledge that residents may find it annoying. The report stated that improved community engagement may alleviate concerns about proposed wind turbine projects, and that community

attitudes and perceptions are related to perceived levels of annoyance (Chief Medical Officer of Health (CMOH)., 2010)(Fast et al., 2016).

While concerns over visual impacts, property values, and wind turbine syndrome have dominated Ontario wind resistance discourse, various scholar have emphasized how the institutional arrangement around wind power contribute to the resistance, both directly by creating a backlash against those who feel excluded and indirectly in how alienation and annoyance contribute to perceived health impacts or a more general reduction in well-being. The two most consequential features contributing to resistance are the stripping of planning authority from local governments and the dearth of community-owned projects (Fast et al 2016; Mulvihill et al 2013; Walker and Baxter 2017). Wind Concerns Ontario denounced the accelerated approval process for " tearing apart the fabric of rural Ontario" (Stokes 2013, 495). Chapter 10 will address these and other contributors to social acceptability of renewable energy technologies.

The resistance movement was effective at mobilizing for the 2011 provincial election, in which wind turbines became a highly contested issue. Despite their quality of the wind resource, proposals for offshore turbines in the Great Lakes were met with vehement resistance. In advance of the election, the governing Liberals placed a moratorium on offshore site of wind (Mulvillhill et al 2013). Premier Dalton McGuinty's governing Liberal Party lost nearly all their rural seats, and lost their majority but remained in power with a minority government. Stokes (2016) estimated that the opposition to wind power cost the governing Liberals between 4 and 10% of the vote for residents living within 3 km of a proposed to operational wind turbine. In the 2014 provincial election, the Liberals, now led by Kathleen Wynne, succeeded in recovering its majority by winning an additional 10 seats.

Policy Revisions

In moving forward with FIT contracts after 2011, the government attempted to remedy issues with wind turbine resistance by prioritizing projects with clear demonstrations of community backing via municipal council resolutions. This, however, turned out to work against the initiative as nearly a quarter of the province's municipalities, 89 in total, passed resolutions stating that they were "unwilling hosts". The provincial government ended the FIT program for projects over 500 KW in 2013 amid widespread criticism (Fast et al., 2016).

During its existence from 2009-2013, the FIT program resulted in 61 contracts for large (>500 kW) wind facilities, creating 3,100 MW of capacity (Fast et al 2016). Ownership was skewed towards large, foreign-owned wind-energy companies. According to Fast et al (2014), "there is only one FIT project with cooperative ownership and several with partial aboriginal ownership, despite the existence of incentives for cooperative and aboriginal-owned projects."

In 2015, the provincial government introduced a new program for wind development, this time through a competitive bid process rather than a feed-in-tariff. This system lent preference for bids that clearly demonstrated pre-arranged positive commitment from local governments and at least 75% of local landowners in signed agreement (Fast et al., 2016).

Estimated impact of resistance

There is no comprehensive analysis examining the impact of wind resistance on project cancellations, delays, or costs. One indicator of community resistance can be found in both appeals of permitting decisions and political mobilization. According to Fast (2016), up to the time of his study, of the 29 wind projects approved, 26 of them had been appealed to the Environmental Review Tribunal. While only one of the appeals led to the project being cancelled, the appeals resulted in delays to the projects getting anyway.

One revealing study examines the impact of the process reforms on project timing. Part of the Green Energy Act's express purpose was to facilitate project development by streamlining review processes, and by taking authority away from local governments, avoiding local resistance leading to project delays and cancellations. A study by Margaret Loudermilk shows the process reforms do not seem to have worked as intended. Despite all the measures to facilitate project approval, the time elapsed between project application and operation was no faster after the reforms than before (Loudermilk 2017). The study does not explicitly examine how much community opposition contributed to the failure of the process reforms to expedite project development.

Despite the explicit intent of preventing place-based resistance from thwarting renewable project development, the decision to take approval authority away from local government seems to have had the exact opposite effect of increasing local resistance to wind turbines. According to Fast and Mabee (2015, p. 9), "removing local planning authority over wind projects has had the most negative repercussions" for community support for project development.

Despite this resistance, Ontario has made enormous strides in decarbonizing its electricity sector since it began phasing out coal. In 2005, coal made up 21% of capacity and 19% of energy generation. It was completely phased out in 2014 (IISD 2015). Wind made up less than 0.1% of capacity in 2005, and grew to 12% and of installed capacity and 8% of electrical energy generation by 2016 (NEB 2017, p. 20). As of December 2017, Ontario has 94 wind installations with a total of 2,515 turbines, with a total installed capacity of 4,900 MW (Canadian Wind Energy Association n.d.). Electricity-sector greenhouse gas emissions declined from 32 million tonnes in 2005 to 4 million tonnes in 2017, a remarkable 88% reduction (IESO 2017, Figure 19).

Election-induced Policy Reversal

In June 2018, a Conservative majority government was elected, making Doug Ford premier. Climate policy and renewable energy were part were among the salient issues in the campaign. Ford has been quite hostile to the green energy agenda. His election platform directly linked the Green Energy Act to higher electricity prices (referred to as "hydro" in much of Canada): "For too long, well-connected insiders have been getting rich off your hydro bills. The Green Energy Act alone represents Ontario's largest-ever wealth transfer from the poor and middle class to the rich" (Ontario Progressive Conservatives 2018). As Table 9.1 shows, energy costs were a significant issue in the campaign, ranking fourth among issues in a pre-election poll, with 28% of respondents saying energy costs were among the top three election issues. Of those who believed energy costs were a significant issue, Ford's party had a 19% advantage over the 2nd place NDP and a 38% advantage over the governing Liberal Party (IPSOS 2018a). A poll taken later that

month found that 61% of respondents said high electricity prices would affect their vote, and among those the Conservatives had a modest advantage over the NDP and a large advantage over the Liberals (IPSOS 2018b). Ford's first act after becoming Premier was to dismantle the province's cap and trade program. Several days later, he cancelled 759 renewable energy contracts that were in the works.

Table 9.1 – Issue ranking and party advantage Ontario 2018 election

Issue	% Ontarians ranking in top 3	Which party is best to deal with the issue
		Party % advantage (2nd closest party)
Healthcare	54	NDP +11% (Liberals)
Economy and jobs	36	Conservatives +19% (NDP)
Lower taxes	29	Conservatives +35% (NDP)
Lower energy costs	28	Conservatives +19% (NDP)
Debt repayment, balanced budget	19	Conservatives +36% (NDP)

Source: IPSOS 2018a.

4. Offshore Wind in New England

The Cape Wind Project was an off-shore wind farm of 130 wind turbines in the Horseshoe Shoal region of Nantucket Sound, off Cape Cod, Massachusetts, United States. The Cape Wind Project, which would be the first off-shore wind facility, was proposed by Cape Wind Associates, LLC (CWA) and developed by Jim Gordon in 2001 as a part of the United States off-shore wind power development to generate 1,500 GWh per year. The project was expected to generate a maximum electricity capacity of 468 MW with an average output of 174 MW (BOEM, n.d.).

In November 2001, the Cape Wind Associates filed a permit application of the wind farm to the Army Corps of Engineers, the federal agency regulating off-shore wind power projects. In 2005, the regulating authority over off-shore wind energy projects was delegated to the Bureau of Ocean Energy Management in the Department of the Interior. Due to these changes in the regulating authority, the Cape Wind Project suffered a setback in completing its Environmental Impact Statement, which was finally published in January 2009. In October 2010, the Cape Wind Associates signed its commercial offshore renewable energy lease after the Department of the Interior approved the issuance of the lease for the project in April 2010.

However, the Cape Wind Project faced with relentless opposition and protracted court challenges for over ten years. In July 2016, the U.S Court of Appeals for the District of Columbia rejected the governmental approvals for the project on the basis that the Cape Wind Associates had not been able to obtain "sufficient site-specific data on seafloor and subsurface harzards" (Cassell, 2016). Eventually, the shifting regulating authority hurdles and legal challenges resulted in the failure of the Cape Wind Energy Project to meet its contract commitments to sell power to local utilities, the National Grid and NSTAR[2] and thus, was terminated in December 2017 (Seelye, 2017; BOEM, n.d.).

The following analysis consists of two parts. The first part examines what motivated the resistance campaign against the project including aesthetic concerns, environmental impacts, and decreased values of shorefront estates. The second part discusses the demise of the Cape Wind project. Its slow death was caused by the initial absence of regulatory framework for offshore renewable energy projects and strategic use of the American court system by the small but well-funded and highly effective opposition, the Alliance to Protect Nantucket Sound.

What had motivated the resistance campaign?

First, the resistance campaign was led by the Alliance to Protect Nantucket Sound, a non-profit environmental organization that was formed in 2002 in response to the proposed Cape Wind Project and is dedicated to preserving Nantucket Sound as a protected area. The opposition also included Public Employees for Environmental Responsibility, the Cape Cod Chamber of Commerce that successfully galvanized the support from local businesses, the Humane Society and Barnstable Land Trust which were the powerful local conservation organizations (Watson and Courtney, 2004). The proposed location of the project had ushered in aesthetic and cultural concerns.

Project opponents were concerned that the 130 wind turbines would jeopardize the tourism value of the region and turn Nantucket Sound into an "industrialized" site (Watson and Courtney, 2004; Ejima et al., 2015). Walter Cronkite, the late legendary broadcaster, denounced the project by proclaiming "Our national treasures should be off limits to industrialization (Burkett, 2003). The resistance campaign also gained support from the Wampanoag Tribe of Gay Head (Aquinnah). The Aquinnah claimed that Nantucket Sound should be protected as a sacred area because their ancestors once lived on land which is now covered by the waters of Nantucket Sound (Love, 2014). On July 6, 2011, they filed a lawsuit against the federal government, given that Kenneth Salazar, the Secretary of the Interior, had issued the federal approval to the project in April 2010 (Toensing, 2011; *Town of Barnstable, Massachusetts, et al. v. Ann G. Berwick, et al.*, 2014).

Second, as the Cape Wind Energy Project was the first off-shore wind farm in the United States, the opposition raised potential environmental impacts over navigation, marine life, migratory birds and, especially seafloor and subsurface hazards (Ejima et al., 2015; Cassell, 2016). The opposition expressed these environmental concerns through the Bureau of Ocean Energy Management within Department of the Interior, which was the regulatory authority of the project, at a U.S District Court in March 2014. Despite the dismissal of the case by the District

[2] NSTAR was a utility company in Massachusetts. In 2015, NSTAR and other subsidiaries were merged to become one large company, Eversource Energy which is also the project developer of the Northern Pass Transmission Project.

Court in November 2014, the Alliance was successful at the Court of Appeals in further delaying the Cape Wind Project because the Bureau was required to undertake adequate geological surveys before any construction was to begin (Cassell, 2016).

Third, the relentless resistance campaign of the Alliance had a strong economic motive resulting from concerns over the potential decrease in values of shorefront estates of wealthy families. As these properties were owned by the Kennedys, billionaire William Koch, former Secretary of State John Kerry and former Governor Mitt Romney, it was not surprising that they were the most adamant opponents to the project (Seelye, 2017; Eckhouse and Ryan, 2017). In his New York Times op-ed in 2005, Robert F. Kennedy, Jr stated: "I do believe that some places should be off limits to any sort of industrial development. I wouldn't build a wind farm in Yosemite National Park. Nor would I build one on Nantucket Sound" (Kenndy Jr, 2005). The Alliance had raised approximately $40 million, in which William Koch was known to donate $1.5 million (Seelye, 2017). The huge donation allowed the Alliance to constantly challenge the Cape Wind Project in court, thereby making the permitting process costly and exhaustive for the Cape Wind Associates and Mr. Gordon.

Impacts of the resistance campaign in thwarting the Cape Wind project

The eventual demise of the Cape Wind Energy Project was caused by the prolonged court battle of the highly-effective and well-funded Alliance. However, the absence of an established framework to review off-shore renewable energy projects created regulatory hurdles, thereby allowing the opposition to take advantage of the hurdles and exacerbating the legal burdens on project proponent, Cape Wind Associates.

When the Cape Wind Associates proposed the wind power facility in November 2001, the U.S Army Corps of Engineers was the regulatory body to grant the permit. It took the Army Corps three years to publish a draft of Environmental Impact Statement (EIS) for the construction (BOEM, n.d.). Then, the Energy Policy Act of 2005 changed the regulatory authority from the Army Corps to the Bureau of Ocean Energy Management in the Department of the Interior. Similar to the Army Corps, the process of EIS could not be achieved any faster under the authority of the Bureau: the draft and final EIS versions were published respectively, in January 2008 and January 2009 (BOEM, n.d.).

The Bureau was also criticized by the opposition for not conducting adequate geophysical and geotechnical surveys to gather data about the seafloors, resulting in a violation of its obligations under National Environmental Policy Act (NEPA). Although the insufficient conduct of geological surveys could be attributed to the Bureau's lack of experiences in handling off-shore energy project, it certainly gave the justification to the opposition to challenge the Bureau in court, further delaying the construction of the wind farm. Hence, the lack of a regulatory framework led to the protracted permitting procedures by both the Corps and Bureau and inadequate handling of obligations under the NEPA by the Bureau.

Lastly, the 130 wind turbines, which were to be located more than 3 miles from shore and required the infrastructure including roads and transmission lines, were subject to regulation by the federal, state and local jurisdictions (Zeller Jr., 2017). This allowed constant litigation against the Cape Wind project at every level. From 2001 to 2014, the opposition had challenged the

project in court, notably, against the Army Corps, the Bureau, and the Massachusetts Energy Facilities Siting Board for the approval of two undersea transmission cables from the proposed facility to the regional power grid, and Department of Public Utilities (DPU) over the above-market power purchase agreements between CWA and its two partners (*Town of Barnstable, Massachusetts, et al. v. Ann G. Berwick, et al.*, 2014).

The Cape Wind Energy Project enjoyed enormous support from major environmental groups including the Sierra Club, the Natural Resources Defense Council and Greenpeace (Zeller Jr., 2017). More importantly, the project received approvals at all of the federal, state and local levels. Nonetheless, it faced fierce opposition from the highly-effective and well-funded Alliance and other groups. The protracted, costly and exhaustive court fighting led to the failure of Cape Wind Associates to meet their contract commitments by December 31st, 2014. Given the cancellation of contracts by the National Grid and NSTAR, the Cape Wind Project was no longer financially feasible and had to be abandoned in December 2017.

5. Solar Controversies in California

In 2008, California's Renewables Portfolio Standard was strengthened to require 33 percent of the state's retail electricity to come from renewable sources by 2020 (Hunold and Leitner, 2011; Cain and Nelson, 2013). In 2015, it was further strengthened to require 50% renewable power by 2030. This policy has led to the development of large-scale renewable energy projects, including solar projects made possible by opening up public lands in remote areas of the Mojave Desert. This "Solar Renaissance" (Hunold and Leitner, 2011) exposed the trade-off between the protection of wildlife and renewable energy development to reduce the threats of climate change. The following analysis focuses on two major solar energy projects of the "Solar Renaissance" era, the Ivanpah Solar Electric Generating System and Soda Mountain Solar Project.

Ivanpah Solar Electric Generating System

Located in the Mojave Desert, the Ivanpah Solar Electric Generating System is a 377-megawatt concentrated solar power facility built on 3,400 acres of public land near the California-Nevada border (Moore and Hackett, 2016; BrightSource Energy, (n.d.). The $2.2 billion project was developed by BrightSource Energy, NRG Energy and Google. In April 2011, BrightSource Energy received a $1.6 billion loan guarantee from the Department of Energy (Garthwaite, 2013; Wiener-Bronner, 2014). The facility consists of three separate heliostat fields with 170,000-plus 12-foot heliostats and three 450-foot power towers (Metcalfe, 2016; Danelski, 2017). The Ivanpah Solar Project was the top priority of the Obama administration's push to reduce America's carbon footprint and move towards a green energy economy.

When BrightSource Energy proposed the project to the California Energy Commission in October 2007, the initial design included a 400-megawatt plant to be constructed on 3,400 acres of land, having 272,000 heliostats arranged in ten circular fields and each with a central power tower (Moore and Hackett, 2016). After redesigning the facility four times, the California Energy Commission granted the siting permit to the current version. The draft environmental impacts statement was published in late 2009, and the California Energy Commission held public hearings in early 2010 (Moore and Hackett, 2016).

In October 2010, the California Energy Commission approved the project and the construction was completed in 2013 (Moore and Hackett, 2016). The facility officially opened on 13 February 2014, and it was the largest concentrated solar power station in the world. The Ivanpah plant has been in operation since its inauguration in 2014.

Soda Mountain Solar Project

Soda Mountain Solar Project is a proposed 287-megawatt solar photovoltaic power facility built on 1,767 acres of public land along Interstate 15 and less than a mile from the Mojave National Preserve in San Bernardino County in California (Steinberg, 2016; The Press-Enterprise, 2016). The project, which would provide power to more than 86,000 homes, was part of the Obama administration's Climate Action Plan to develop 20,000 MW of renewable energy on public lands by 2020 (Steinberg, 2016; The Press-Enterprise, 2016). In June 2015, the City of Los Angeles decided not to purchase electricity from the Soda Mountain Solar Project, delivering a blow to the project's former developer, Bechtel Corporation (Sahagun, 2015). In March 2016, the project received a federal approval from the U.S Department of Interior (The Press-Enterprise, 2016).

On 23 August 2016, the Soda Mountain Solar Project, however, was unable to obtain the last approval from the San Bernardino County to start construction activities (Sahagun, 2016a). The County Board of Supervisors declined to authorize a county permit in a 3-2 vote with Vice-Chair Robert Lovingood saying: "We endorse renewable energy, but this was the wrong project in the wrong location" (Sahagun, 2016a). By this time, Regenerate Power had bought the project from Bechtel Corporation. After the rejection from the San Bernandino County, Regenerate Power was determined to overcome the last hurdle and push the project forward (Steinberg, 2016). Nevertheless, the construction has not been begun at the time of writing.

Motivations of Resistance

As both the Ivanpah and Soda Mountain Solar Projects are in close proximity to the Mojave Wilderness, the primary motivation of resistance against the siting of the two projects is concerns impacts on wildlife species such as desert tortoise, birds and bighorn sheep in the Mojave National Preserve. In the case of the Ivanpah Solar Project, there were additional concerns about loss of a spiritual place and spots for recreational activities.

Desert tortoises have lived in the Ivanpah Valley region for millions of years and are listed as a threatened species under the Endangered Species Act (Kerlin, 2018; Moore and Hackett, 2016). The Ivanpah tortoises are considered a genetically distinct population and the Ivanpah Valley region is an important habitat for the survival of the species (Moore and Hackett, 2016). Furthermore, the desert tortoises are vulnerable to human development.

Desert conservationists and biologists opposed the siting because the project would encroach on the tortoise habitat. Surveys found a more than 150 tortoises near the proposed location for the facility (Garthwaite, 2013). The Ivanpah project site was also a refuge for migratory birds travelling along the Pacific Flyway (Sahagun, 2016b). The intense radiation created by thousands of the heliostat mirrors has actually resulted in Birds were burned alive while flying through the facility (Sahagun, 2016b; Sweet, 2015; The San Bernardino Sun, 2014).

Estimates of the deaths per year were extremely varied, ranging from a low 1,000 by BrightSource Enegy, 3,500 by a Wall Street Journal report, 6,000 by federal biologists to a high 28,000 by the Centre for Biological Diversity environmental group (Sahagun, 2016b; Sweet, 2015; The San Bernardino Sun, 2014).

The majority of dead birds consisted of humming birds, warblers, doves, sparrows and swallows. Plumes of smoke appeared as the birds were incinerated in mid-air; thus, the birds were given a name, "streamers" (Sahagun, 2016b). Due to the high number of bird deaths, federal wildlife experts referred to the Ivanpah project site as "a mega-trap" for wildlife species (The San Bernardino Sun, 2014). Major opponents against the siting of the Ivanpah Solar Project included the Sierra Club, which argued for the re-siting of the power facility to a place that was not a habitat for the desert tortoise, and the National Parks Conservation Association, which stated the proposed siting would "degrade the federally protected resources of Mojave National Preserve" (Moore and Hackett, 2016).

In the case of Soda Mountain Solar Project, opponents expressed similar environmental concerns over habitat for bighorn sheep, foxes, owl and migratory birds. This underdeveloped Soda Mountain region was an important habitat for the bighorn sheep, but they were separated between North Soda Mountain and South Soda Mountain by Interstate 15 (Sahagun, 2016a; Steinberg, 2016; The Press-Enterprise, 2016). As the bighorn sheep population had experienced a strong growth rate in recent years, biologists proposed to restore migration corridors to avoid the species becoming genetically isolated (Sahagun, 2016a; Steinberg, 2016; The Press-Enterprise, 2016). The proposed power facility would undermine the effort of re-establishing the key migration routes and thus have inadvertent impacts on the growth of the bighorn sheep.

In addition to its value a wildlife habitat, the Ivanpah Valley was a spiritual place for several Native American tribes in the region. There were a prayer site and an altar on the hill above the project site (Moore and Hackett, 2016). Also, the Native American tribes believed that the spiritual powers were originated in the absence of human development in the area (Moore and Hackett, 2016). Hence, the siting of the project triggered relentless resistance from the Native American peoples. They organized a 14-mile relay run, the Ivanpah Spirit Run and turned it into an online documentary, "Solar Gold" by Robert Lundahl (Moore and Hackett, 2016).

Furthermore, opponents claimed that the Ivanpah Valley region was the treasured place for hiking, camping on and bird watching. An activist said: "This is big energy taking public lands that we own..." (Moore and Hackett, 2016). Indeed, a message reverberated throughout the resistance campaigns was that the project demonstrated the "privatization of public wildlands…by transforming multiuse places into single-use industrial zones" (Moore and Hackett, 2016). Activists held two protest hikes in 2008 and 2010 to uphold the right of the public to hike and camp on the Ivanpah land (Moore and Hackett, 2016).

Impacts of the Resistance Campaigns

Despite the resistance campaigns, the construction of Ivanpah Solar Electric Generating System was eventually completed and began operating in 2013, The Ivanpah project received multiple awards such as the Concentrated Solar Power Project of the Year by Solar Power

Generation USA in February 2012 and Plant of the Year by Power Magazine in August 2014 (Overton, 2014; REVE, 2012).

While the strong resistance of opponents was not able to stop the project, it did results in several significant changes. First, the developers had to scale back from the original 400-megawatt design to the current 377-megawatt version to reduce the disturbance to desert tortoise habitat. Second, the Bureau of Land Management ordered a temporary suspension of construction in April 2011 to gauge the impacts on the desert tortoises (California Desert District, 2011). In June 2011, the Bureau lifted the suspension order as the U.S Fish and Wildlife Service "found the project [was] not likely to jeopardize the endangered desert tortoise" (BLM, 2011). Third, Bright Source Energy has spent more than $56 million on mitigation efforts for desert tortoises, including the care program for juvenile tortoises, providing the nurseries, and relocation (Wiener-Bronner, 2014; BrightSource Energy, n.d.). Without the relentless pressure from the environmentalists, desert conservationists and biologists, such mitigation efforts might not be implemented.

Unlike the Ivanpah Solar Electric Generating System, the Soda Mountain Solar Plant has not been able to overcome the resistance. The strong opposition campaigns led to the cancelation of power-purchase plan by the major customer, City of Los Angeles in June 2015. The Sierra Club was strongly in favour of the city's decision: "The Sierra Club is delighted to see the city do the right thing and choose not to sign a power purchase agreement with this harmful project" (Sahagun, 2015). In addition, project opponents had successfully lobbied the San Bernardino County Board of Supervisors to rule against the project by not granting the final permit that the developer needed to proceed with the construction. The project has been halted till now.

Both of the projects experienced the relentless resistance campaigns during the siting process due to the negative impacts on wildlife in the Mojave Desert, but the outcomes were different. Two factors may explain the failure of the Soda Mountain Solar Project. First, City of Los Angles was expected to be the key customer to purchase electricity from the project. It turned out that the Los Angeles Department of Water and Power found other proposed renewable energy projects that would charge the City less for electricity. Second, although the project was in the federal plan to reduce the country's reliance on fossil fuels, it did not receive as strong support from the federal government as the Ivanpah Solar Project. In addition, the Soda Mountain Solar Project experienced a change in the project developer, which may have complicated the ability to surmount opposition. In stark contrast, with the assistance from the Obama administration, reinforced by the powerful developers, the Ivanpah Solar Project successfully overcame all the roadblocks to complete its construction phase.

6. Transmission line conflicts in California

The Tehachapi Renewable Transmission Project (TRTP) is a 173-mile transmission project, developed by Southern California Edison (SCE) to bring up to 4,500 megawatts of renewable energy (enough to supply 3 million homes) from wind farms in Kern County to substations in Los Angeles and San Benadino counties (Southern California Edison, n.d.). The project, with an estimated cost of $2.1 to $2.5 billion, was designed to contribute to California's Renewable Portfolio Standard's requirement to obtain 33% of its energy from renewable sources by 2020 (Cain and Nelson, 2013).

As part of Decision (D.) 09-12-044, granted in December 2009 by the California Public Utility Commission (CPUC), Southern California Edison received approval for the construction of a 3.5-mile segment of 500kV overhead transmission facilities, Segment 8A, through a residential area of Chino Hills (CPUC, 2013). This segment triggered vehement opposition from residents of the city. In October 2011, the City of Chino Hills formally requested that the segment planned through their community be "undegrounded." In July 2013, the California Public Utility Commission granted the petition of Chino Hills and ordered the undergrounding of the 3.5-mile transmission line.

Motivations of Resistance

The resistance was motivated by concerns about visual disruption, decreased property values, and health and safety concerns. Opposition within Chino Hills results in the formation of Hope for the Hills in 2007, a non-profit grassroots organization of about 1,500 residents in Chino Hills established to raise awareness about their concerns with the Tehachapi Renewable Transmission Project. The 3.5-mile overhead powerline segment would consist of transmission towers reaching 195-198 feet tall and occupying a 150-foot right of way (ROW) (CPUC, 2013). In comparison to other cities along the project route, Segment 8A in Chino Hills had the narrowest right of way. Thus, the towers would be located very close to the residential structures, exacerbating the visual impacts of the transmission lines. Chino Hills had 200 residential structures affected by the narrow right of way, which were the largest number compared to the towns of Duarte (94) and Ontario (36) (CPUC, 2013).

Hope for the Hills and City of Chino Hills advocated relentlessly to underground the lines because of concerns the proximity of the transmission towers could reduce homeowners' property values (Tasci, 2013). Most importantly, Chino Hills had become part of the identity of residents since they had grown attached to the city. Hence, the visual disruption by the tall towers would lead to a disruption of sense of place and impingement of the community identity.

Hope for the Hills and City of Chino Hills were concerned that the proximity would cause exposure of residents to electromagnetic radiation and cancer (Tasci, 2013, Nisperos, 2016). Although evidence for health risks of high-voltage transmission lines has not been proven definite, the perceived health risks certainly intensified the community-based stigma toward Segment 8A. Another aspect of perceived risks in this case was the concern over earthquakes. As Chino Hills is located in an earthquake-prone zone, residents were worried about the collapse of the tall structures in a disaster (Tasci, 2013, Nisperos, 2016. For instance, Garcia, a registered nurse who has lived in Chino Hills with his family since 1997 said that: "We live in an earthquake zone. If a disaster strikes, that thing could fall right through my house" (Willon, 2011).

Impacts of the Resistance Campaigns

Hope for the Hills had utilized protests, social media and the internet to amplify the perceptions of risk in the community (Cain and Nelson, 2013). The City of Chino Hills was also an active opponent of the project, committing $4.7 million in legal fees to force Southern California Edison to put the powerline underground. Although the California Supreme Court refused to hear the challenge against Southern California Edison, the two parties were successful in

lobbying the California Public Utility Commission (Dombek, 2011). On November 11, 2011, the California Public Utility Commission ordered that the utility halt the construction of Segment 8A and required it to submit alternatives for Segment 8A in response to an Application for Rehearing and Motion for Partial Stay filed by the City of Chino Hills (CPUC, 2011). On July 11, 2013, CPUC ruled against Southern California Edison, voting 3-2 in favor of undergrounding Segment 8A in Chino Hills, though the lines remained above ground in other cities.

Cost estimates of undergrounding Segment 8A in Chino Hills ranged from $300 million to $800 million compared to the cost estimate of $170 million to build the overhead transmission line (Dombek, 2012; Southern California Edison, n.d.b). However, this could be a better option than the alternative suggested by Hope for the Hills and City of Chino Hills. The City had developed an alternative route, in which the transmission lines would run through the existing ROWs of the Chino Hills State Park, but an amendment of the Land Use General Plan was required and could delay the construction process for 8 to 15 months. In the summer of 2014, Southern California Edison began the construction of the underground line in Chino Hills. The Tehachapi Renewable Transmission Project has been in operation since December 2016, though it was originally scheduled to be operational in 2015 (Tweed, 2010).

7. The Northern Pass between Quebec and New England

The Northern Pass project is a proposed $1.6 billion system of high-voltage transmission line to bring 1,090 megawatts of Canadian hydropower produced by Hydro-Quebec to New Hampshire and the rest of New England (Northern Pass Transmission, LLC, n.d.; Pentland, 2018). The project, developed by Eversource Energy (Eversource), comprises 192 miles of 80- to 135-foot towers and transmission lines, running from the border town of Pittsburg, New Hampshire, where it would connect to the Quebec Hydro grid, and ending in Deerfield, New Hampshire, where it would connect to the grid of New England (Keir & Ali, 2014; Tierney & Darling, 2017). One-third of the proposed transmission lines would be underground lines, given that 80 percent of the facilities are on existing transmission right-of-way or under public roadways (Tierney & Darling, 2017).

The Northern Pass was expected to generate up to $500 million in annual revenues for Hydro-Quebec (CBC, 2018a). More importantly, the Northern Pass could help New England substantially reduce carbon emissions by up to 3.2 million tons a year (Northern Pass Transmission, LLC, n.d.). In November 2017, Hydro-Quebec and Eversource received a presidential permit for the project from the US Department of Energy (Department of Energy, 2017). In January 2018, they continued to receive the approval from Massachusetts for the Northern Pass by winning the biggest 20-year energy deal in the history of Quebec's public utility (CBC, 2018a).

However, the project was rejected in February 2018 by New Hampshire's Site Evaluation Committee (SEC), which is the state's key permitting authority over the project (CBC, 2018b; Pentland, 2018). On Friday, October 12th, 2018, the New Hampshire Supreme Court accepted the appeal of Eversource, which is expected to be heard in early 2019 (Concord Monitor, 2018). Nevertheless, the construction of the Northern Pass through New Hampshire will not likely to happen because Massachusetts decided in March 2018 to move forward with a revised plan,

proposed by Central Maine Power Company and Hydro-Quebec, of importing hydro power from Quebec through Maine (Chesto, 2018; CBC, 2018c).

The following analysis consists of two parts. The first part examines what has motivated the The second part discusses the impacts of the resistance campaign over the Northern Pass, in which the key players include the Society for the Protection of New Hampshire Forests (the Forest Society) the Appalachian Mountain Club (AMC) and SOS Mont Hereford.

Motivations of the resistance campaign

The resistance campaign against the project was motivated by visual impacts, decreased property values, environmental impacts, and economic impacts. The project proposed to run through the tourism region of New Hampshire, Great North Woods Region (also known as North Country), which is home to the Franconia Notch State Park, Pawtuckaway State Park, the Appalachian National Scenic Trail, and the White Mountain National Forest. The construction of thousands of new towers through the North Country would obstruct the scenic landscapes in these natural tourist attractions, according to the visual impact analysis by the Appalachian Mountain Club (Difley, 2011; Burbank, 2012).

Opponents are concerned that the tower visibility may lead to reduced attractiveness of the scenery, thus having detrimental impacts on tourism, which is the second-largest industry of New Hampshire (Tierney and Darling, 2017; Difley, 2011). Indeed, studies have found that the Northern Pass could lead to a reduction in tourism-related spending by 9 percent, which translates to average annual losses of $13 million to the Gross State Product and approximately 200 jobs between 2020 and 2030 (Tierney and Darling, 2017).

Project proponents have emphasized job creation and an increase of tax payments. Gary A. Long, president and chief operating officer of Public Service of New Hampshire has stated that the Northern Pass would create an annual average of 1,200 jobs during the three-year construction period and an estimate of $24.5 million in state, local and county tax payments in New Hampshire (Long, 2011).

On the other hand, opponents have highlighted the temporary basis of construction jobs and export of economic profits from New Hampshire (Keir & Ali, 2014). The State Energy Strategy of New Hampshire, published in 2014, has called for energy independence, increasing use of in-state renewable energy resources and circulation of energy revenues within the state's economy (Tierney and Darling, 2017). Hence, opponents have concerned that the benefits of the Northern Pass would be exported to large companies like Hydro-Quebec and the project developer Eversource, based in Hartford, Connecticut and Boston, Massachusetts, while New Hampshire would bear the most burdens but receive few benefits from the project.

Although various studies have produced mixed evidence on whether transmission lines cause a decrease in property values, local residents in towns along the proposed route have strongly opposed to the project (Evans-Brown, 2014). The visual impacts would undoubtedly reduce the attractiveness of properties located near the towers.

Concerns were also raised that the transmission facilities would cause forest fragmentation on the protected conservation lands owned by the Forest Society in New

Hampshire. Since 1901, the Forest Society has had a mission of protecting the landscapes of New Hampshire and a goal of "[protecting] sustainably-managed forests to support our forest-based economy" in the face of growing commercial development pressure (the Forest Society, n.d.). Unsurprisingly, the Forest Society is the most relentless opponent to the Northern Pass, mobilizing its reputation and finances for its opposition campaign, "Trees Not Towers: Bury Northern Pass" (the Forest Society, n.d.).

The Northern Pass project has also faced strong opposition in Quebec, Canada. The transmission line of the Quebec portion would run through the conservation area of Hereford Mountain, a part of the White Mountains of the Appalachians (Montreal Gazette, 2017). The SOS Mont Hereford group, which is comprised of the Nature Québec, Estrie Regional Environmental Council, Appalachian Corridor and Protected Natural Environments Network has called on Hydro-Quebec to reconsider the route (Montreal Gazette, 2017). Due to the location of the transmission facilities in the heavily-forested regions, the opponents have expressed concerns over the decline of biodiversity including environmental degradation of wetlands and forests and disruption of wildlife habitat.

Similar to the Cape Wind project, there is also an Indigenous resistance movement against the Northern Pass. Dams, reservoirs and power stations of Hydro-Quebec that would produce the energy for New England are constructed on the traditional territory of the Pessamit Innu, a tribal nation in Quebec (Casey, 2017). The Innus have opposed to the project because of concerns that their salmon fishery and traditional hunting grounds could be affected (Casey, 2017). Although the Innus brought their opposition to the public hearing session of the Site Evaluation Committee in July 2017, the impact of the allegation on the Site Evaluation Committee SEC's decision is unclear.

Impacts of the resistance campaign

The Forest Society and SOS Mont Hereford have called for all the power lines to be buried underground, Eversource and Hydro-Quebec have only agreed to have 60 miles of underground lines due to high costs of burying all the lines (Northern Pass Transmission, LLC, n.d.). As the two sides have had uncompromising stances on the location of the transmission lines, the Forests Society has been able to raise $850,000 to secure a 5,800-acre conservation easement on a property that would be a potential route of the Northern Pass (Keir & Ali, 2014; the Forest Society, n.d.; State Impact New Hampshire, n.d.).

The opposition has also resorted to personal criticism in the media. The Balsams Grand Resort Hotel located in the northernmost part of New Hampshire, has been under a redevelopment plan spearheaded by Mr. Les Otten, who has received a $2-million loan from the $200 million development fund managed by Eversource (Solomon, 2016; Tracy, 2016; Difley & Webb, 2016). Mr. Otten has been denounced for his tie with Eversource and criticized for pressuring the North Country Chamber of Commerce to change its opposition stance against the project (Solomon, 2016; Tracy, 2016; Difley & Webb, 2016). Although Mr. Otten has denied the allegation, the opposition's condemnation has put a stain on Eversource's reputation, further exacerbating the unpopularity of the Northern Pass in New Hampshire.

Due to the relentless opposition, the project and Eversource's appeal were rejected, respectively, in February and May 2018 by the Site Evaluation Committee (Casey, 2018; CBC, 2018b). On Friday, October 12th, 2018, the New Hampshire Supreme Court accepted the appeal of Eversource, which is expected to be heard in early 2019 (Concord Monitor, 2018). Given the reputation and resources of project opponents, particularly the Forest Society, and disagreement over the underground transmission lines, the Northern Pass is expected to endure a protracted litigation process. The project is likely dead as a result of the March 2018 Massachusetts's decision to cancel the Northern Pass project and instead, pursue the competing Maine transmission line project of Avangrid (Chesto, 2018, CBC, 2018c).

8. Conclusion

The cases reviewed in this chapter clearly demonstrate that place-based resistance has the potential to frustrate the implementation of renewable energy infrastructure required for decarbonization. Not all renewable energy projects attract opposition, and in many cases even when they do, opposition can be surmounted. But the record contains a sufficient number of cases where place-based resistance has resulted in costly delays and/or project modifications, and most dramatically, outright project cancellations.

In the case of wind power in Ontario, place-based opposition led to number of delays, modifications, and even cancellations of projects. The 2018 election resulted in a humiliating loss for the governing Liberal Party, and a reversal of many of its climate and renewable energy policies. Place-based resistance did not play a direct role in the 2018 election results, but the extreme politicization of the province's energy and climate policies did contribute to the election result. In the Cape Wind case off the Massachusetts coast, place-based resistance contributed directly to project cancellation.

The paper also reviewed two efforts to site two concentrated solar power projects in the Mojave Desert region on California. One of the projects has been blocked by environmental concerns about wildlife habitat. The other is under operation after some delay and redesign of the project to reduce habitat disturbance. The case of the California transmission line, proposed explicitly to connect new wind farms to load centres, was able to surmount opposition but only after delays and costly project modifications to place a segment through Chino Hills underground. The Northern Pass Transmission Project, which would have helped New England reduce carbon emissions by importing Quebec hydropower, has been cancelled as a result of vehement place-based resistance.

These cases also reveal the importance of the four factors laid out in the introduction. Opposition group access to institutional veto points is a very important element of the power of project opponents, but in complex ways. The multiple veto points of the American federal system were especially apparent in the Cape Wind and Northern Pass cases, where opposition groups seemed to try every venue possible to block the project, including courts and federal and state regulatory processes. In the Soda Mountain solar case in California, it was the San Bernardino County Board of Supervisors that rejected the project. In the Ontario wind case, in the early years of resistance community groups also sought to use the zoning authority of local governments to block projects, but the provincial government stripped them of that authority. While that removed the capacity of local governments to thwart projects, it also decreased the sense of

community empowerment, which has aggravated the degree of resistance. We'll return to this dilemma shortly.

The more a project can take advantage of existing infrastructure, the less resistance it's likely to encounter. Powerlines, for example, have a smaller marginal impact on a landscape if they can be sited in, or adjacent to, existing rights of way. But projects that have that advantage are by no means guaranteed to be successful. A very high fraction of the Northern Pass Transmission Project would have taken advantage of existing infrastructure, but some portions could not. And those segments generated enough resistance to thwart the project.

The salience of place-based, concentrated risks and benefits is apparent in all of these cases, from treasured rural landscapes in Ontario, to desert tortoises, bighorn sheep, and migrating birds in the Mojave Desert, to cherished forest mountains in New Hampshire, and precious views of unspoiled Nantucket Sound, impacts to special values play a critical role in all of these cases. Projects that have been able to surmount place-based resistance have found ways to tailor the project to reduce the risk to treasured values sufficiently, as shown by the Ivanpah Solar project and Tehachapi Renewable Transmission Project.

The final factor is the geographical separation of risk and benefits. All of these cases reveal the importance of this variable as well. While renewable energy creates greater potential to concentrate risks and benefits in the same location, they frequently don't. Rural community resistance to wind power in Ontario was so strong because the benefits of the development were typically far away. Transmission lines, pipelines for electrons, are inherently project that impose impacts on communities they pass through for the benefit of those at one of both ends of the line.

Overcoming place-based resistance is critical to decarbonization. If governments around the world can't get projects sited and built because of local resistance, fundamental human needs will not be met. Fortunately, the literature on public engagement contains a wealth of insights into how to gain greater acceptance for contested infrastructure processes. That literature demonstrates the importance of deep and meaningful engagement with stakeholders, in ways that governments have traditionally been quite reluctant to do (Hoberg 2018b).

This chapter has demonstrated that like new fossil fuel infrastructure, renewable energy infrastructure has attracted significant place-based resistance that has led to costly project delays or alterations, and in some cases outright cancellation. Renewable energy resistance is not a direct consequence of the movement to keep fossil fuels in the ground. In fact, the academic literature on the social acceptance of renewable energy emerged before the climate movement made the strategic pivot to blocking infrastructure. The resistance dilemma is that the keep in the ground movement builds the institutional, social, and cultural muscles that strengthen the capacity of groups intent on resistance to renewable energy.

Perhaps the most significant component of this dilemma is whether local governments should be granted veto power. If they are, it gives authority to local authorities – Indigenous or not – the capacity to veto projects determined to be in the interests of the broader geographic political jurisdiction. Yet if that power is taken away, local groups resent the disempowerment, and that can strengthen resistance. The engagement literature (Hoberg 2018b) sees hope in giving communities a say, but engaging them in meaningful processes that help community members

see the broader public interests being promoted by projects that have impacts on treasured local values. Giving local communities a real governance role risks resistance, but shutting them out probably results in a much great chance of impactful project opposition.

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