



University of Pennsylvania  
**ScholarlyCommons**

---

Social Impact Research Experience (SIRE)

Wharton Undergraduate Research

---

2020

## Green but Colour Blind: Environmental Racism in Canada and the Unintended Consequences of Electric Vehicle (EV) Incentives on Socioeconomic and Racial Inequality

Brandon Nguyen  
*University of Pennsylvania*

Follow this and additional works at: <https://repository.upenn.edu/sire>



Part of the [Business Commons](#), [Energy Policy Commons](#), [Environmental Studies Commons](#), and the [Public Policy Commons](#)

---

Nguyen, Brandon, "Green but Colour Blind: Environmental Racism in Canada and the Unintended Consequences of Electric Vehicle (EV) Incentives on Socioeconomic and Racial Inequality" (2020). *Social Impact Research Experience (SIRE)*. 85.

<https://repository.upenn.edu/sire/85>

This paper is posted at ScholarlyCommons. <https://repository.upenn.edu/sire/85>  
For more information, please contact [repository@pobox.upenn.edu](mailto:repository@pobox.upenn.edu).

---

# Green but Colour Blind: Environmental Racism in Canada and the Unintended Consequences of Electric Vehicle (EV) Incentives on Socioeconomic and Racial Inequality

## Abstract

Inequality and climate change are some of the most pressing issues facing society today. This paper begins by providing brief documentation on the current state of environmental justice (EJ) and racism research as well as detailing cases of environmental racism in Canada. This paper then aims to contribute to EJ literature by arguing that even in the absence of malicious intent, disproportionate access to non-essential environmental benefits is an EJ issue. This paper applies this understanding of EJ and environmental racism to electric vehicle (EV) point-of-purchase rebates in Canada to showcase the ways in which such policies are inefficient from an economic standpoint, and counterproductive from an anti-racism perspective. This paper then offers alternatives to incentivizing EV purchases among lower-income and black, indigenous and people of colour (BIPOC) communities. We conclude by calling on policymakers to better undertake due diligence to understand how policies can unintentionally perpetuate systemic racial and socioeconomic inequality.

## Keywords

Environmental Justice, Environmental Racism, Electric Vehicle, Subsidies, Rebates, Inequality, Canada, Africville, Chemical Valley

## Disciplines

Business | Energy Policy | Environmental Studies | Public Policy

# **Green but Colour Blind: Environmental Racism in Canada and the Unintended Consequences of Electric Vehicle (EV) Incentives on Socioeconomic and Racial Inequality\***

Author: Brandon Nguyen (brandonn@wharton.upenn.edu)

Advisor: Sarah E. Light, Wharton Associate Professor of Legal Studies & Business Ethics

Summer 2020, Wharton Social Impact Research Experience (WSIRE)

## **ABSTRACT**

Inequality and climate change are some of the most pressing issues facing society today. This paper begins by providing brief documentation on the current state of environmental justice (EJ) and racism research as well as detailing cases of environmental racism in Canada. This paper then aims to contribute to EJ literature by arguing that even in the absence of malicious intent, disproportionate access to non-essential environmental benefits is an EJ issue. This paper applies this understanding of EJ and environmental racism to electric vehicle (EV) point-of-purchase rebates in Canada to showcase the ways in which such policies are inefficient from an economic standpoint, and counterproductive from an anti-racism perspective. This paper then offers alternatives to incentivizing EV purchases among lower-income and black, indigenous and people of colour (BIPOC) communities. We conclude by calling on policymakers to better undertake due diligence to understand how policies can unintentionally perpetuate systemic racial and socioeconomic inequality.

**Keywords:** Environmental Justice, Environmental Racism, Electric Vehicle, Subsidies, Rebates, Inequality, Canada, Africville, Chemical Valley.

**Disciplines:** Energy Policy, Environmental Studies, Public Policy.

---

\* Thank you to the Wharton Undergraduate Division for providing the opportunity and funding to pursue this project.

**Table of Contents**

Introduction .....3

Current State of Research on Environmental Racism .....4

Environmental Racism in Canada: Africville .....9

Environmental Racism in Canada: Chemical Valley .....12

Unequal Access to Benefits as an Environmental Justice Issue .....15

Social Implications of EV Subsidy Policies .....20

What can be Done .....26

Conclusion .....29

References .....30

## **Introduction**

Inequality and climate change are two of the most pressing issues facing society today. This paper begins by providing documentation on the current state of environmental justice (EJ) and racism research as well as detailing cases of environmental racism in Canada. We then aim to contribute to EJ literature by arguing that even in the absence of malicious intent, disproportionate access to non-essential environmental benefits is an EJ issue. This paper then applies this understanding of EJ and environmental racism to electric vehicle (EV) point-of-purchase rebates in Canada to showcase the ways in which such policies are inefficient from both an economic standpoint, as well as an anti-racism approach. We conclude by calling on policymakers to undergo intentional due diligence to understand how policies can unintentionally perpetuate systemic racial and socioeconomic inequality.

## **History of Environmental Racism**

Environmental racism is a term that arose from the long-seated concept of environmental justice, a “movement [that] addresses a statistical fact: People who live, work, and play in America’s most polluted environments are commonly people of color and the poor”.<sup>1</sup> Environmental racism as a term gained popularity more recently, choosing to explicitly focus on the racial dimensions of environmental justice. Dr. Robert Bullard is often deemed the father of environmental justice, writing and publishing prolific and novel accounts that highlight not only the disproportionate burden of pollution felt by minority communities, but also the disproportionate lack of access to environmental benefits such as clean water and other natural resources.

---

<sup>1</sup> Palmer, 2016

Several events throughout U.S. history have precipitated the environmental justice movement. Some point to the 1982 Warren County protests in North Carolina as the first major event, wherein a hazardous landfill was proposed for construction in a small and predominantly black community. The landfill would accept toxic soil from illegal dumping along roadways.<sup>2</sup> Warren County was the poorest county in the state, and was one of the only majority African-American areas at the time.<sup>3</sup> This sparked a NAACP-led response that resulted in a protest. Warren County citizens physically laid in front of trucks carrying the contaminated soil and partook in nonviolent and collective direct action. While the protests failed to stop the disposal facility, it led to the creation of several community groups that brought newfound awareness to environmental justice. Earlier examples of the environmental justice movement include “in the early 1960s, Latino farm workers led by Cesar Chavez [fighting] for workplace rights, including protection from harmful pesticides [and] in 1967, African-American students [taking] to the streets of Houston to oppose a city garbage dump”.<sup>4</sup> Simply put, while the phenomenon has only fairly recently gained traction in mainstream academic discourse, the implications of environmental injustice have long harmed BIPOC communities.

### **Current State of Research**

Extant literature across disciplines such as political science, history and sociology on environmental justice and racism tend to focus on two main questions from both a theoretical and an empirical approach: what is environmental racism, and what causes environmental racism.

---

<sup>2</sup> U.S. DOE, 2020

<sup>3</sup> Sasz & Meuser, 1997

<sup>4</sup> Palmer, 2016

## What is Environmental Racism

The early stages of environmental justice and racism research were fixated on both defining the terms themselves, as well as providing ample evidence that they are material phenomenon.<sup>5</sup> A typology of existent literature would be incomplete without at least mentioning Bullard and his defining of environmental racism as referring to “any environmental policy, practice or directive that differentially affects or disadvantages (whether intended or unintended) individuals, groups or communities based on race or colour.”<sup>6</sup> This definition of environmental racism places the concept as a subset within the broader field of environmental justice, which is “defined as the fair treatment and meaningful involvement of all people regardless of race, colour, national origin or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.”<sup>7</sup> Other scholars have extended this definition to emphasize the relationship between environmental justice and other concepts such as spatial relations and class.

For many, the definition of “environmental laws, regulations and policies” extend far beyond what Bullard may have initially conceived of—Bolin, Grineski and Collins focus on the relationship between the physical and spatial environment with broader historical and social practices in their research, defining environmental racism “to denote a complex of social and spatial practices which systematically disadvantage people marked by certain racial categories

---

<sup>5</sup> Zupan, 1973; Freeman, 1974; Kruvant, 1975; Berry, 1977; Asch & Seneca, 1978; Gianessi et al., 1979

<sup>6</sup> Bullard, 1999

<sup>7</sup> Bullard, 1993

[including] acts of omission, such as failing to provide urban infrastructure and acts of commission, such as the imposition of unwanted land uses.”<sup>8</sup>

A common misunderstanding with environmental racism is that it is necessarily explicit in having malicious intent. However, most instances of environmental racism have arguably resulted from an implicit failure to understand how policies disproportionately harm certain communities. Bullard argued that, “whether by conscious design or institutional neglect, communities of color in urban ghettos, in rural ‘poverty pockets’, or in economically impoverished Native-American reservations face some of the worst environmental devastation in the nation.”<sup>9</sup> It is largely agreed upon by scholars that malicious intent is not a condition for environmental racism to exist.<sup>10</sup> Rather, an environmental justice framework allows “disparate impact and statistical weight or an ‘effect’ test, as opposed to ‘intent’, to infer discrimination.”<sup>11</sup> Scholars have applied an institutional racism lens when looking at the ways that environmental racism is compounded by other forms of discrimination, including “succession of land uses, patterns of housing segregation, racialized employment patterns, financial practices, and the ways that race permeates zoning, development, and bank lending processes in urban areas.”<sup>12</sup>

### **What Causes Environmental Racism**

Economic theories have explained the emergence of race-based differentials in exposure to environmental risks through three main mechanisms: “pure discrimination by polluters or politicians in siting decisions; differences in willingness to pay for environmental amenities

---

<sup>8</sup> Bolin, Grineski & Collins, 2005

<sup>9</sup> Bullard, 1993

<sup>10</sup> Bolin, Grineski & Collins, 2005; Bullard, 1996; Pulido, 2000

<sup>11</sup> Bullard, 1999

<sup>12</sup> Boone & Modarres, 1999; Cole & Foster, 2001

linked to income or education levels; and variations in the propensity of communities to engage in collective action to oppose the location of potential polluters.”<sup>13</sup> This is corroborated by empirical evidence that suggests the propensity of communities to partake in collective resistive action is likely one of the most significant reasons for environmentally racist outcomes.<sup>14</sup> Other causes of environmental racism include pure discrimination by polluters and differences in the willingness to pay for environmental amenities among different communities. Rather, an environmental justice framework should shift the “burden of proof to polluters/dischargers who do harm, who discriminate or who do not give equal protection to people of colour, low-income persons and other ‘protected’ classes.”<sup>15</sup> Companies looking to construct a disposal facility should provide ample evidence that the negative environmental externalities from their facility does not disproportionately harm BIPOC and low-income communities. This is divergent from the current standard in many regions, where it is the responsibility of local communities to organize action against unjust exposure to environmental risks.

A fourth cause of environmental racism in siting is that the decision was made without consideration to demographics at all. Rather, it is coincidentally “close to sources of raw materials and/or to consumers of the product; there is an abundance of affordable acreage; the site has access to transportation infrastructure such as highways, rail lines, rivers or ports; the area is already zoned for industrial uses; geological conditions are right for a waste site.”<sup>16</sup> This factor would explain environmental racism only if there was a statistically significant correlation

---

<sup>13</sup> Hamilton, 1995

<sup>14</sup> Ibid.

<sup>15</sup> Bullard, 1999

<sup>16</sup> Szasz & Meuser, 1997

between the proportion of BIPOC individuals in communities, and non-demographic related factors favourable to siting (closer to sources of raw materials, etc.).

It also cannot be overstated the degree to which class and race issues overlap in environmental justice—much of environmental racism is perpetuated by disproportionate exposure to risks based on socioeconomic class, which is inherently partially race-based given the myriad of ways in which institutional racism allocates economic and political power to white communities.<sup>17</sup>

As put by Bullard, “In the real world, all communities are not created equal. All communities do not receive equal protection. Economics, political clout and race play an important part in sorting out residential amenities and disamenities. Environmental racism is as real as the racism found in housing, employment, education and voting.”<sup>18</sup> Environmental racism is upheld by government, legal, economic, political and military institutions that, whether intentional or not, impose industrial plans and political policies that allocate economic benefits to wealthier neighbourhoods and environmental risks to poorer communities.<sup>19</sup>

This deeper, institutional view of environmental racism has been a large focus of more recent scholars who have aimed to develop empirical studies to confirm the phenomenon and explore causal mechanisms. For example, one study by Bolin, Grineski & Collins that focuses on South Phoenix, Arizona explored the ways in which environmentally racist outcomes were tied to long-seated historical factors including “pervasive racial exclusion, class domination, political disenfranchisement, and a racially segmented economy. These factors, imbricated in a variety of historical combinations, have been materialized in distinct land-use and socioeconomic patterns

---

<sup>17</sup> Bloome, 2015; Shapiro, Meschede & Osoro, 2013

<sup>18</sup> Bullard, 1999

<sup>19</sup> Ibid.

in the central city.”<sup>20</sup> The study finds that “understanding the ways racial categories are socially constructed and employed in the production of space in the city, including the distributions of people and environmental hazards is a central part of understanding environmental racism.”<sup>21</sup> These more recent studies described above demonstrate the ways in which EJ research have expanded far beyond the scope of original research, which focused on establishing a baseline statistical correlation between environmental waste, and proximity to BIPOC and low-income communities.

### **Environmental Justice in Canada: Africville**

One of the most disturbing cases of explicit environmental racism in Canadian history also remains surprisingly absent from mainstream awareness: Africville in Nova Scotia, Canada (ancestral and unceded territory of the Mi’kmaq People) in the mid-1900’s. Black residents have inhabited Halifax, Nova Scotia long before its founding in 1749.<sup>22</sup> Over many years, hundreds of Black formerly enslaved people immigrated from both the Caribbean as well as the United States. Blatant discrimination from white settlers, however, eventually pushed Black settlers towards more inhospitable regions of Halifax. These informal settlements in the inhospitable regions soon became known as “Africville”. Despite many Africville residents paying taxes to the municipal government, the City of Halifax failed to provide amenities to Africville that were provided to white communities including access to clean water, proper sewage and garbage disposal. This lack of access to basic environmental resources was compounded by the construction of a dump nearby.

---

<sup>20</sup> Bolin, Grineski & Collins, 2005

<sup>21</sup> Bolin, Grineski & Collins, 2005; Pulido et al., 1996

<sup>22</sup> Nova Scotia Communities, Culture and Heritage, 2020

Despite playing an active role in denying basic services that deteriorated the quality of life in Africville, the municipal government and white residents then labeled the community a ‘slum’, which supposedly justified removal of the region under the



Source: Courtesy of Bob Brooks/ Nova Scotia Archives

guise of an “urban renewal” agenda.<sup>23</sup> According to the Canadian Museum for Human Rights, “in January 1964, Halifax City Council voted to authorize the relocation of Africville residents. Before this decision was made, there was no meaningful consultation with residents of Africville to gather their views.”<sup>24</sup> While compensation was offered predominantly to Africville residents who could prove formal ownership of their land, all residents were forced to relocate regardless of whether they wanted to or not. In the end, the region was converted to an industrial zone and very few of the promised support systems to help Africville residents transition actualized.<sup>25</sup>

The forcible eviction of Africville residents from their land (despite many having formal records of ownership) might be one of the most explicit displays of a central tenet of environmental racism: that BIPOC communities often do not have the same rights in accessing environmental benefits. In this case, the environmental benefit is quite literally the land they live on. An interview with Sunday Miller, the former Executive Director of the Africville Heritage and Trust reveals a story with powerful imagery that evokes an almost sarcastically literal

---

<sup>23</sup> Nelson, 2000

<sup>24</sup> McRae, 2020

<sup>25</sup> Denise, 2003

manifestation of another central tenet of environmental racism: the treatment of black, indigenous and POC bodies as being lesser:

She told me about a City Worker who had helped move an old woman out of her home in a **garbage truck**. The worker said: “I remember this woman because she was between me and the driver and she cried all the way into the city because she didn’t want to leave, didn’t know why they were making her leave. What really bothered me – she didn’t even know where she was going. They could have taken her anywhere.”<sup>26</sup>

While this strikes us now as being obviously discriminatory, many at the time had (questionable) but at least outwardly positive intentions. The framing of Africville as a slum helped justify the removal and the relocation of the residents in an effort to ‘improve living conditions’:

“Then it became a positive symbol in the mind of white Canada for slum clearance and urban renewal and racial integration, as the population of about 400 were removed from their homes ‘for their own good’ and the physical community of Africville was bulldozed into the ground.”<sup>27</sup>

This account of Africville serves not only to raise awareness of a tragic event in Canadian history that is deserving of more consideration, but also to frame the following discussion of more subtle forms of environmental racism. Environmental justice issues can arise in situations that are much more discrete in nature. In fact, arguably most incidences of environmental racism occur without any explicitly racist intentions.<sup>28</sup> The next case will demonstrate the important role that class play in facilitating more covert forms of environmental injustice.

---

<sup>26</sup> McRae, 2020

<sup>27</sup> Walker, 1997

<sup>28</sup> Gareis-Smith, 1994

## **Environmental Justice in Canada: Chemical Valley**

“Forty percent of Canada’s petrochemical industry is packed into a 15-square mile area in Sarnia, Ontario, called the Chemical Valley. More than 60 chemical plants and oil refineries operate there 24/7.”<sup>29</sup> The region has the most polluted air in Canada, according to a World Health Organization report from 2011.<sup>30</sup> Situated between all of these petrochemical plants is the Aamjiwnaang First Nations reservation, where around 850 Chippewa have lived for over 300 years.<sup>31</sup> Despite being one of the most toxic communities in North America, the government has yet to implement a conclusive study on the health effects of the chemicals on local residents. Since then, several different local groups have emerged to



Source: VICE

call for action from the government, including the Aamjiwnaang Environmental Committee and the Aamjiwnaang Solidary Against Chemical Valley organization.<sup>32</sup> While the group has seen many successes, such as stopping the construction of Suncor’s new Ethanol Plant in 2002, there is still lots of work to be done by the government.<sup>33</sup>

A 2013 investigative journalism piece by VICE found that “Often, the responsibility for detecting leaks falls to community members like Ada Lockridge, an Aamjiwnaang Environmental Committee member and outspoken activist who owns an air-testing kit called a

---

<sup>29</sup> McGuire, 2013

<sup>30</sup> United Nations, 2011

<sup>31</sup> Jackson, 2010

<sup>32</sup> Bannister & Alexander, 2016

<sup>33</sup> Aamjiwnaang Environment Department, 2020

Bucket Brigade.”<sup>34</sup> Community members would have to collect air and environmental samples themselves to be shipped to and processed in California for \$500 in order to prove to companies and local governments that leaks were present. While community-engaged scholarship with Aamjiwnaang First Nation’s citizens have revealed the



Source: Aamjiwnaang Solidarity Against Chemical Valley website

myriad of ways in which they have coped to survive, placing the burden of proof on citizens is a dangerous precedent that can lead to disproportionate environmental risks in areas where the local community has a lessened capacity to self-advocate <sup>35</sup>

### **How did this happen?**

A challenging aspect of the situation is that it is hard to pinpoint an exact moment at which it became an issue of health and environmental justice. The petrochemical industry first moved to the region due to its close proximity to major urban hubs in both Canada and the United States (Toronto, Detroit, Chicago, etc.), as well as newly discovered oil just south of the city in the mid-1800s.<sup>36</sup> Petrochemical companies purchased land from the people of Aamjiwnaang in the mid-1900’s, during which the health and environmental implications of the chemical industry was not

---

<sup>34</sup> McGuire, 2013

<sup>35</sup> Wiebe, 2015; Luginaah et al., 2010

<sup>36</sup> McGuire, 2013

yet known. The town of Sarnia quickly became dependent on the petrochemical industry which employed many of its residents. Over time, more and more research has revealed the toxic effects of chemicals on humans and the environment. While all of the petrochemical facilities follow government pollution guidelines, there is still a lot that is not understood about the effects of mixing different pollutants in such close proximity:

One petrochemical plant is legally allowed to produce a certain amount of Pollutant A, and another plant down the road is allowed to produce a different amount of Pollutant B—but no one knows what happens when A and B meet and combine in the air above a populated area like Aamjiwnaang. The Chemical Valley’s atmosphere is full of an unsettlingly unregulated, dangerous cocktail of poisons.<sup>37</sup>

Preliminary scientific research and accounts of lived experiences have found detrimental health effects on the Aamjiwnaang reservation, including higher rates of cancer and other impairments caused by Benzene and other toxic air pollutants.<sup>38</sup> The preliminary findings constitute more than enough evidence, many would argue, to pose a “threat of serious and irreversible damage” necessary to apply the precautionary principle. In practice, applying the precautionary principle would mean that governments would impose stricter regulations on chemical pollutants until a more comprehensive study were done on the health implications of air-borne chemicals mixing in such close proximity. Rather, the government has not only failed to address pressing health concerns even in light of increased calls for action in the community, but the government has also resisted funding a comprehensive study needed to establish the “scientific certainty” required to bypass the precautionary principle.

---

<sup>37</sup> Jim Brophy, Interview with VICE in 2013

<sup>38</sup> McDonald, 2020

## **Takeaways**

This case serves not only to raise awareness on an issue that is still very much active, but also to showcase the more sinister ways in which environmental racism and environmental justice permeate policy when corporations are left to operate in their own self-interest. Even if these companies have no explicitly malicious intentions to disproportionately impact BIPOC communities and were acting rational in a strictly economic sense, they have undoubtedly caused extensive harm to the surrounding communities. The earlier literature review covers research that is illuminated by this example: that environmental racism often persists through a cumulative historical process. In this case, many petrochemical companies were later located in the region as it was understood that adding an incremental factory in a region already abundant would be much easier of a task than constructing a facility in a completely new region.

The case of Chemical Valley also demonstrates the extent to which oftentimes environmental policy is implemented without proper due diligence. In this case, the government did not (and still does not) know the complete health implications of so many different chemical pollutants mixing within a dense area. While lawyers advocate for a precautionary principle approach in environmental law, that is not always the case.

## **Unequal Access to Environmental Benefits as an Environmental Justice Issue**

### **Unequal access to fundamental environmental resources**

Unequal access to fundamental environmental resources has marked Canada's problematic and exploitative relationship with indigenous communities. As environmental justice gained traction as a movement, researchers increasingly argued that "the deliberate siting of hazardous waste sites, landfills, incinerators, and polluting industries in communities inhabited by First

Nations communities represent a social justice issue of considerable magnitude.”<sup>39</sup> For generations, indigenous communities in Canada have lacked fair access to water and air free from contaminants such as mercury, sewage and other industrial by-products.<sup>40</sup> Despite the salience of these injustices, the extent to which these issues have persisted point to the friction faced by those aspiring to institute change.<sup>41</sup> Furthermore, the lack of fair access to environmental benefits extends beyond the realm of fundamental resources such as clean land, air and water.

### **Windfall profits from the environmental movement**

While the cost of transitioning to a climate-compatible society is significant, there will also undoubtedly be various windfall profits and benefits as governments incentivize consumers and corporations to adopt more sustainable practices. For example, the Canadian federal government issued over \$300 million CAD in EV rebates from 2020 to 2023<sup>42</sup>, as well as \$155 million CAD in research and development subsidies to mobilize clean technologies.<sup>43</sup> The intent is not to challenge the effectiveness of these environmental subsidies, which have been shown to be a critical tool in the climate transition portfolio.<sup>44</sup> However, there is little research on the social implications of who is, and is not receiving a share in these significant windfall profits and government subsidy programs.

### **Unequal access to environmental benefits as an environmental justice issue**

---

<sup>39</sup> Dhillon & Young, 2010

<sup>40</sup> Assembly of First Nations, 2005

<sup>41</sup> Human Rights Watch, 2016

<sup>42</sup> The Canadian Press, 2020

<sup>43</sup> Natural Resources Canada, 2019

<sup>44</sup> Acemoglu et al., 2014

While less salient of an issue than lack of access to more fundamental environmental benefits such as clean water and air, the disproportionate access to less essential environmental benefits is still an environmental justice issue. Predominantly White and high-income areas have a statistically significantly higher degree of access to lower congestion parks, which have been shown to provide a myriad of health and social benefits.<sup>45</sup> This unequal access to environmental benefits extends far beyond the realm of simple green space—studies have also corroborated the role of race, even when controlling for income level, in dictating access to affordable clean energy and clean mobility options.<sup>46</sup>

Not only do many of these perceived environmental “luxuries” have important implications on more salient essential needs (such as health outcomes in the case of parks,<sup>47</sup> and employment prospects in the case of clean mobility)<sup>48</sup>, but inequitable access to less evidently essential environmental benefits are indicative of faltering efforts to dismantle systemic and institutional racism. Ensuring access to clean water and air necessary to live a healthy life should be the bare minimum—ensuring equitable access to less fundamental but still important environmental benefits, should be the aim.

A counterargument of this view might be that the seemingly unintentional role of race in this access disparity is evidence that it is not an environmental justice issue. It could be argued that individuals and communities are not denied access to green space or affordable clean energy by some malicious and omnipresent individual explicitly on the basis of their race. Rather, other

---

<sup>45</sup> Sister et al., 2009; Comber et al., 2008

<sup>46</sup> Sunter et al., 2019; Forkenbrock & Schweitzer, 1999

<sup>47</sup> Cohen et al., 2007

<sup>48</sup> Yi, 2006

factors in BIPOC communities, such as increased incidences of poverty, better explain this access disparity.

### **Race and socioeconomic status as social relations**

When environmental justice research began gaining traction, an early question many attempted to answer was the competing and relative role of race versus income as a factor in disproportionate exposure to environmental risks. Not only have studies found that race can be the predominant “explanatory factor” depending on the region and geographic unit of analysis of the data set,<sup>49</sup> but more importantly, many have posited the methodological flaws in treating socioeconomic status and race as discrete factors in issues such as environmental justice. As put by Downey, “A pitfall of the race versus income debate as framed in much of the environmental justice literature is that it implies that the one factor that is found to be ‘right’ has to be so at the expense of the other. Such a conclusion does not follow from institutional models of environmental racism.”<sup>50</sup> The reason behind this institutional formulation of environmental justice is that:

‘Race’ and ‘class’ are not things, and are not cleanly compartmentalizable as discrete things. They are, rather, social relations that interact in complex ways. Environmental Justice research reifies these categories. It reduces them to their operationalizations. It sets them up as airtight things that can be isolated, both conceptually and methodologically, typically with multivariate statistics. It then tries to determine, in an either/or fashion, which is the more important or powerful variable.”<sup>51</sup>

---

<sup>49</sup> Downey, 1988

<sup>50</sup> Ibid.

<sup>51</sup> Pulido, 1996

Racial inequalities are deeply connected to class inequalities and vice versa, and to discount the merit of environmental racism on the basis that income plays a predominant role over race would be to discount the disproportionate role race plays in class and wealth accumulation.

### **Social implications of environmental policies**

Thus, it becomes important to be cognizant of broader social implications of environmental policies. While race may never explicitly be the reason why one might lack access to affordable clean energy or green spaces (which is disputable, given the body of research that has found a statistically significant effect even when controlling for socioeconomic status), income oftentimes can be a direct and causal impediment to accessing environmental benefits. For example, one might lack access to green spaces because local municipalities financed by property taxes are relatively underfunded in lower income areas. Under an institutional understanding of racism whereby socioeconomic inequality has compounded along race-based lines as a result of historical legal, social and political factors, it is worth being critical of policies that, even in the absence of explicit racist intentions, may perpetuate and recreate discriminatory and race-based outcomes.

An example of the potential consequences when race is not explicitly factored into seemingly innocuous and well-intentioned environmental policies exists in the phenomenon of “green gentrification”. One study found that “after decades of disinvestment and abandonment, developers buy degraded buildings and transform them into high-end residents, and eventually wealthier residents start moving in and enjoying new associated amenities for which long-term residents fought for during decades. In return, low-income residents and people of colour are

often displaced because it seems that they cannot afford to stay. This process of land revaluation, greening, and displacement illustrates what is now called ‘green gentrification’.”<sup>52</sup>

Researchers have identified the underpinning of socioeconomic issues in the environmental justice movement, “tying environmentalism to a broader quest for social and economic justice, that is the achievement of community wealth creation, equitable redistribution of resources, employee ownership, alternative local economic and workforce development strategies, and increased organizing at the union or neighbourhood level.”<sup>53</sup> The remainder of this paper will apply this logic—that in the presence of institutional racism, any policies that do not explicitly address and consider race, can perpetuate systemic inequalities—to the domain of electric vehicle (EV) subsidies.

### **EV Policies Perpetuating Systemic Inequalities**

The next section in this paper will focus on applying findings from the previous sections to establish the ways in which electric vehicle (EV) subsidy policies can unintentionally perpetuate racial and socioeconomic inequalities. While this paper is focused on the Canadian environmental policy landscape, there is a dearth of empirical evidence on their impacts in Canada. However, in the United States which has similar policies, there is much more ample empirical research on the social implications of EV policies in the American context. The findings of this section corroborate the work of U.S.-based community organizations and activists such as The Greenlining Institute, EVHybridNoire and GRID Alternatives that have long argued the need to integrate an actively anti-racist framework in ensuring equitable distribution of benefits in the clean energy transition.

---

<sup>52</sup> Anguelovski, 2015

<sup>53</sup> Ibid.

## **EV Policies in Canada**

There is a federal point-of-sale rebate for up to \$5,000 for “individuals purchasing vehicles with a base MSRP under \$45,000 before including delivery centre fees.”<sup>54</sup> This can be combined with provincial and local incentives, which can add an additional rebate of up to \$3,000 or \$8,000 in the case of British Columbia and Quebec respectively. Other EV incentives include carpool lane access, as well as rebates for charging infrastructure installation. No distinction, however, is made in distributing the subsidy policies—anyone who purchases an electric vehicle would automatically be eligible for the rebate. In total, the federal government has pledged “\$300 million, on a first-come, first-served basis, over the next three years” starting in 2019.<sup>55</sup> An additional \$130 million CAD has been committed from 2019-2024 in order to subsidize charging infrastructure in public places, workplaces and multi-unit residential buildings.<sup>56</sup>

## **Disproportionate allocation of Economic Benefits**

First and foremost, the data overwhelmingly points to the economic benefits of EV subsidies being disproportionately allocated towards wealthy and predominantly white communities. The Pacific Research Institute found that in 2014, 79% of electric vehicle tax credits went to households making over \$100,000, while 99% of them went to households making at least \$50,000.<sup>57</sup> In fact, the largest share of households with hybrid and electric cars earned at least \$200,000, per a 2017 survey.<sup>58</sup> This stark difference in subsidy allocation also exists on the macro, community level: “Of the \$151 million in subsidies paid since 2010 [in California],

---

<sup>54</sup> Tesla Canada, 2020

<sup>55</sup> The Canadian Press, 2020

<sup>56</sup> Natural Resources Canada, 2020

<sup>57</sup> Winegarden, 2018

<sup>58</sup> Carmax, 2017

people who bought zero-emissions vehicles in the Bay Area, South Coast, and San Diego air basin have gotten \$132 million. Over the same period, people in the San Joaquin Valley have gotten \$3 million, despite having the most intractable air quality problems in the state.”<sup>59</sup>

This disparity also exists along race-based lines, with a study finding that Hispanic and African Americans accounted for just 8.4% and 1.4% of new battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs), respectively. This disproportionately low level of ownership among African American and Hispanic residents holds true even after controlling for income.<sup>60</sup> Whether or not one agrees with the effectiveness of these subsidies at accelerating adoption of clean technologies, it is indisputable that these blanket subsidies “exacerbate the already alarming racial wealth gap.”<sup>61</sup>

### **Disproportionate allocation of Environmental Benefits**

Aside from the disproportionate allocation of economic benefits towards largely white and affluent communities, many traditional EV subsidy programs have also resulted in a disproportionate allocation of environmental benefits. This is exacerbated by the fact that many BIPOC communities, as previous environmental justice literature have posited, are already disproportionately impacted by the harmful effects of emissions from gasoline and electricity generation.<sup>62</sup> This is supported by an NBER working paper that found that “census block groups with median income greater than about \$65,000 receive positive environmental benefits from electric vehicle adoption whereas block groups with income less than this threshold receive

---

<sup>59</sup> Margonelli, 2014

<sup>60</sup> Rubin & St-Louis, 2016

<sup>61</sup> Malveux, 2019

<sup>62</sup> Bosworth & Patty, 2017

negative environmental benefits.”<sup>63</sup> According to the study, this is a result of BIPOC communities being disproportionately exposed to pollution from increased electricity generation and manufacturing associated with EV adoption. In short, not only are less affluent BIPOC communities receiving few economic benefits from EV subsidy programs, but they are also actively worse off in terms of exposure to environmental risks from increased electricity generation and EV manufacturing.

### **Blanket EV Subsidies as Inefficient**

Not only is there a moral appeal to restructuring EV subsidy programs to lessen the extent to which they perpetuate racial and socioeconomic inequities, but there is a glaring fiscal dimension to the argument as well. Blanket EV subsidy programs have been criticized for being regressive and ineffective for two main reasons. First, is that the assumption that all EV purchases are equal in abating carbon emissions is false. Low income folks disproportionately rely on used and oftentimes old vehicles colloquially known as “gas guzzlers”. In fact, for “every 1997 vehicle in Mendota [a region in California] wipes out emissions benefits of 29 electric vehicles in San Ramon [one of the highest earning regions in the U.S.]. More precisely, it only takes 16 of Mendota’s finest lunkers to turn the benefits of nearly \$1 million in subsidies for San Ramon into a pile of sooty particulate.”<sup>64</sup> Other studies have found that the marginal alternative for wealthier families if they do not purchase an EV vehicle to be much cleaner than the alternative for lower-income households. These results could reasonably be interpreted to conclude that incentivizing

---

<sup>63</sup> Holland et al., 2016

<sup>64</sup> Margonelli, 2014

wealthier individuals may not be as efficient as previously assumed, compared to incentivizing lower-income individuals to purchase EVs.<sup>65</sup>

The second fiscal dimension to the argument of EV subsidy reform is that there is empirical evidence suggesting that a blanket subsidy fails to target marginal purchasers of EVs. One study in particular found that federal income tax credits in the U.S. resulted in a 29% increase in EV sales, however 70% of the credits were obtained by households that would have bought an EV without the rebates.<sup>66</sup> Rather, the study found that:

By comparing the current uniform subsidy with an alternative policy design that removes the subsidy for high-income households and provides additional subsidies to low-income households, our analysis shows that better targeting could potentially increase the cost effectiveness of the subsidy programs in terms of EV demand and environmental benefits.<sup>67</sup>

Rather, implementing an income-tiered rebate program to better target marginal purchasers of EVs can achieve the same level of incremental EV deployment at a much cheaper cost to taxpayers. Furthermore, such a system would help improve access to clean mobility options to more BIPOC and lower-income communities.

### **Charging Infrastructure Exacerbate Institutional Inequality**

Another mechanism through which EV subsidies have exacerbated racial and socioeconomic inequities is through the network effects of charging infrastructure. The Canadian government has announced over \$130 million CAD in subsidies to be distributed from 2019-2024 in order to

---

<sup>65</sup> Bento et al., 2018

<sup>66</sup> Xing et al., 2019

<sup>67</sup> Ibid.

deploy a network of charging infrastructure “where Canadians live, work and play.”<sup>68</sup> However, Natural Resources Canada (NRCan) is only willing to fund up to 50% of the project costs up to a maximum of five million dollars per project.

This becomes almost an issue of the chicken or the egg—EVs will find it difficult to gain traction in communities where charging infrastructure is not robust, but at the same time it is difficult to make the case for charging infrastructure in areas that are not already decently dense in EV uptake. While the government is aiming to mitigate this issue by sparking private investment through these subsidies, there currently lacks substantive data and research on EV infrastructure investment on a granular, community-by-community level. If charging infrastructure subsidy demographics look anything like the demographics of EV rebate recipients, then it can be inferred that these government subsidies, which are aiming to phase out long before EVs will be more accessible to low- and middle-income households, are predominantly being allocated towards wealthier and whiter neighbourhoods. The subsidy in of itself is not inherently malicious but exacerbating the disparity in access to clean mobility infrastructure and resources along socioeconomic and race-based lines can have damaging effects.

### **Solutions & Next Steps**

The intention of this paper is not to advocate for the abandonment of EV subsidies or incentive programs. Rather, the goal is to point out the complexity of often overlooked social implications of environmental policies. Particularly, this paper calls for the importance of intentional due diligence before policy implementation. Without the abolishment of institutional

---

<sup>68</sup> Natural Resources Canada, 2020

and systemic inequalities, policies, programs and practices that are not explicitly cognizant can oftentimes lead to adverse impacts on marginalized communities. Luckily, there are tangible and concrete examples of how equity can be better integrated into efforts to decarbonize our transportation and mobility systems. The remainder of this paper will focus on discussing the tried and tested alternatives and additional considerations, and what these findings mean in the context of Canadian environmental policy.

### **Income-dependent subsidy**

To help combat the fact that many subsidies are not being allocated to marginal purchasers, Canada should consider implementing an income-dependent subsidy as they have been found to be “more effective in stimulating EV demand and reducing emissions, and they could also be better justified on distributional grounds.”<sup>69</sup> An income-dependent subsidy would help combat the results from one study, which found that around 70% of Federal income tax credits went to households that would have bought an EV without the credits.<sup>70</sup> A second study had similar results in the context of the Canadian subsidy programs, finding that 74% of recipients of hybrid electric vehicle rebate programs would have purchased the vehicle without the subsidy.<sup>71</sup> California’s Clean Vehicle Rebate Program (CVRP) implemented income requirements in 2016 such that residents with a gross annual income exceeding \$150,000 would not be eligible for rebates.<sup>72</sup> While this is a step in the right direction, a more robust income-dependent subsidy such that lower-income households are eligible for a higher amount of subsidy, could help bolster accessibility and economic efficiency of the policy.

---

<sup>69</sup> Xing et al., 2019

<sup>70</sup> Xing et al., 2019

<sup>71</sup> Chandra et al., 2010

<sup>72</sup> Maclay, 2016

### **Targeted programs for low-income gas guzzlers**

Many are understandably skeptical of targeted programs for low-income and disadvantaged communities, which can come at a higher cost/vehicle subsidized. However, the metric this policy is trying to “optimize” is not simply uptake of EVs, but rather reducing carbon emissions. Therefore, every EV purchase is not the same—those that replace the use of old gas guzzling automobiles are much more effective than EV purchases that are replacing a newer, hybrid vehicle. This, compounded with the fact that older and less fuel-efficient vehicles are disproportionately represented in lower-income and BIPOC communities, means that while lower-income subsidy programs might have a higher cost per vehicle, they likely will have a lower cost per ton of carbon emissions reduced.<sup>73</sup> For example, we can imagine in an imaginary and simplistic world that a higher-income household would require a \$10,000 subsidy to incentivize the purchasing of an EV. On the other hand, a low-income household would require a \$20,000 subsidy to incentivize the purchasing of an EV. While it may seem inefficient to provide subsidies to the lower income households, it would make sense if the EVs would replace gas guzzlers used by low income households that release more than double the emissions of the vehicles used by the higher income households. While this example is overly simplified, the same logic applies to practical policymaking—subsidy programs should consider the heterogenous environmental benefits of EVs among different income and demographic groups.

### **More accessible forms of EV ownership**

For many, walking into a dealership and purchasing a new EV through traditional financing methods is the only conceivable path to EV ownership. The reality, however, is there are many

---

<sup>73</sup> Xing et al., 2019; Martin, 2019

more accessible paths and models of EV ownership that governments and policymakers ought to leverage. Currently, there exists very few incentives for EVs on the second-hand market.<sup>74</sup> For many, it would take an unfeasibly large subsidy before purchasing an EV could become a realistic consideration. While the second-hand EV market is still very new, governments should begin exploring the mechanics of how such an incentive program might work.<sup>75</sup>

Another possible alternative is combining a point-of-purchase rebate with a government-subsidized, low-interest financing package. Such a combination has been used in San Francisco through the Clean Vehicle Assistance Program targeted towards lower-income residents.<sup>76</sup> Many EV sharing programs have also been piloted in cities across the world.<sup>77</sup> While almost all of these pilots and programs have been spearheaded by automobile manufacturers themselves, there may be room for government policy to incentivize expansion of these programs.

### **Continued support for advocacy groups**

Lastly, none of this work would have ever been possible if it were not for the countless grassroots organizers, advocates and groups that have long called for better integration of equity and inclusion principles in decarbonization and environmental policy. A non-exhaustive list of these organizations include the Partnership for Southern Equity, Greenlining Institute, EVHybridNoire, GRID Alternatives, and many more.<sup>78</sup> Many of these organizations serve not only to conduct some of the primary and fundamental research required for sound policymaking, but they also actively advocate and organize to influence policies and programs in the interest of

---

<sup>74</sup> Nobre & Pedrosa, 2018

<sup>75</sup> McKie, 2020

<sup>76</sup> State of California, 2020

<sup>77</sup> Green Car Reports, 2018

<sup>78</sup> EVMatch, 2020

the BIPOC communities they represent. In fact, there have been highly applicable resources developed by industry and community organizations in the Canadian landscape, including a presentation by the Canadian Urban Sustainability Practitioners organization on better integrating equity into electric vehicle programs.<sup>79</sup>

## **Conclusion**

This paper began by reviewing the state of current research in environmental racism and environmental justice research. The brief overview of Africville and Chemical Valley served to portray the explicit and implicit ways in which environmental racism has persisted throughout recent Canadian history. This paper then argues that disproportionate access to environmental benefits (essential and non-essential) is an environmental justice issue. We carry this understanding to the case of EV rebate subsidies, revealing the ways in which such a policy is not only inefficient but can also perpetuate systemic racial and socioeconomic inequalities. Lastly, this paper introduced potential policy mechanisms to better improve EV subsidies from both an economic as well as an equity approach. These include: additional support for community organizations, an income-dependent subsidy, targeted programs for low-income gas guzzlers, and more advocating for more accessible forms of EV ownership.

Future research could better explore how to best target EV policies at marginal purchasers by looking at concrete subsidy amounts for different income buckets. In addition, research that could lead to practical solutions for how to best target and differentiate lower-income individuals that would have otherwise continued driving old gas guzzlers would benefit the current academic and policy discourse.

---

<sup>79</sup> Canadian Urban Sustainability Practitioners, 2020

## References

- Aamjiwnaang Environment Department. *Aamjiwnaang*, 2020,  
[www.aamjiwnaang.ca/environment-department/](http://www.aamjiwnaang.ca/environment-department/).
- Acemoglu, Daron, et al. "Transition to Clean Technology." 2014, doi:10.3386/w20743.
- Allen, Denise. "Africville: The Case for Compensation." Received by The United Nations  
Special Rapporteur on Contemporary Forms of Racism, 20 Sept. 2003.
- Anguelovski, Isabelle. "From Toxic Sites to Parks as (Green) LULUs? New Challenges of  
Inequity, Privilege, Gentrification, and Exclusion for Urban Environmental Justice."  
*Journal of Planning Literature*, vol. 31, no. 1, 2015, pp. 23–36.,  
doi:10.1177/0885412215610491.
- Asch, Peter, and Joseph J. Seneca. "Some Evidence on the Distribution of Air Quality." *Land  
Economics*, vol. 54, no. 3, 1978, p. 278., doi:10.2307/3145999.
- Bannister, Gordon, and Grace Alexander. *Aamjiwnaang Solidary Against Chemical Valley*, 11  
July 2016, [aamjiwnaangsolidarity.org/about/](http://aamjiwnaangsolidarity.org/about/).
- Bento, Antonio M., et al. "Flawed Analyses of U.S. Auto Fuel Economy Standards." *Science*,  
vol. 362, no. 6419, 2018, pp. 1119–1121., doi:10.1126/science.aav1458.
- Berry, Brian J.L. *The Social Burdens of Environmental Pollution: a Comparative Metropolitan  
Data Source*. 1977.
- Bloome, Deirdre. "Racial Inequality Trends and the Intergenerational Persistence of Income and  
Family Structure." *American Sociological Review*, vol. 79, no. 6, 2014, pp. 1196–1225.,  
doi:10.1177/0003122414554947.

Bolin, Robert, et al. "The Geography of Despair: Environmental Racism the the Making of South Phoenix, Arizona, USA." *Human Ecology Review*, vol. 12, no. 2, 1 Dec. 2005, pp. 156–168.

Boone, Christopher G., and Ali Modarres. "Creating a Toxic Neighborhood in Los Angeles County." *Urban Affairs Review*, vol. 35, no. 2, 1999, pp. 163–187., doi:10.1177/10780879922184347.

Bosworth, Ryan C., and Grant Patty. Strata, 2017, *The Current State of Electric Vehicle Subsidies: Economic, Environmental, and Distributional Impacts*.

Bullard, Robert D. "Environmental Justice: It's More Than Waste Facility Siting." *Social Science Quarterly*, vol. 77, no. 3, Sept. 1996, pp. 493–499.

Bullard, Robert D. "Dismantling Environmental Racism in the USA." *Local Environment*, vol. 4, no. 1, 1999, pp. 5–19., doi:10.1080/13549839908725577.

Bullard, Robert D. "Race and Environmental Justice in the United States." *Yale Journal of International Law*, 1993.

The Canadian Press. "Canada Launched an Electric-Car Rebate with a 3-Year Budget. Eager Buyers Gobbled Nearly Half in 8 Months | CBC News." *CBCnews*, CBC/Radio Canada, 28 Jan. 2020, www.cbc.ca/news/canada/british-columbia/electric-car-rebate-canada-half-its-3-year-budget-in-8-months-1.5443129.

Canadian Urban Sustainability Practitioners. "Integrating Equity into City Electric Vehicle Programs ." 2020.

CarMax. "2017 Hybrid/EV Survey Results." *CarMax*, CarMax, 18 July 2017, www.carmax.com/articles/hybrid-electric-2017-survey-results.

- Chandra, Ambarish, et al. “Green Drivers or Free Riders? An Analysis of Tax Rebates for Hybrid Vehicles.” *Journal of Environmental Economics and Management*, vol. 60, no. 2, 2010, pp. 78–93., doi:10.1016/j.jeem.2010.04.003.
- Cohen, Deborah A., et al. “Contribution of Public Parks to Physical Activity.” *American Journal of Public Health*, vol. 97, no. 3, 2007, pp. 509–514., doi:10.2105/ajph.2005.072447.
- Cole, Luke W., and Sheila R. Foster. *From the Ground up: Environmental Racism and the Rise of the Environmental Justice Movement*. New York University Press, 2001.
- Comber, Alexis, et al. “Using a GIS-Based Network Analysis to Determine Urban Greenspace Accessibility for Different Ethnic and Religious Groups.” *Landscape and Urban Planning*, vol. 86, no. 1, 2008, pp. 103–114., doi:10.1016/j.landurbplan.2008.01.002.
- Dhillon, C., and M.G. Young. “Environmental Racism and First Nations: a Call for Socially Just Public Policy Development.” *Canadian Journal of Humanities and Social Sciences*, vol. 1, no. 1, 2010, pp. 25–39.
- Downey, Liam. “Environmental Injustice: Is Race or Income a Better Predictor?” *Social Science Quarterly*, vol. 79, no. 4, Dec. 1988, pp. 766–778.
- Forkenbrock, David J., and Lisa A. Schweitzer. “Environmental Justice in Transportation Planning.” *Journal of the American Planning Association*, vol. 65, no. 1, 1999, pp. 96–112., doi:10.1080/01944369908976036.
- Freeman, A Myrick. “On Estimating Air Pollution Control Benefits from Land Value Studies.” *Journal of Environmental Economics and Management*, vol. 1, no. 1, 1974, pp. 74–83., doi:10.1016/0095-0696(74)90018-7.

- Gareis-Smith, D. "Environmental Racism: the Failure of Equal Protection to Provide a Judicial Remedy and the Potential of Title VI of the 1964 Civil Rights Act." *Temple Journal of Science, Technology & Environmental Law*, 1994.
- Gianessi, Leonard P., et al. "The Distributional Effects of Uniform Air Pollution Policy in the United States." *The Quarterly Journal of Economics*, vol. 93, no. 2, 1979, p. 281., doi:10.2307/1883195.
- Green Car Reports. "Electric Car-Sharing Programs Expanding in U.S." *Green Car Reports*, 18 Sept. 2018, [www.greencarreports.com/news/1118838\\_electric-car-sharing-programs-expanding-in-u-s](http://www.greencarreports.com/news/1118838_electric-car-sharing-programs-expanding-in-u-s).
- Hamilton, James T. "Testing for Environmental Racism: Prejudice, Profits, Political Power?" *Journal of Policy Analysis and Management*, vol. 14, no. 1, 1995, p. 107., doi:10.2307/3325435.
- Holland, Stephen, et al. "Distributional Effects of Air Pollution from Electric Vehicle Adoption." 2016, doi:10.3386/w22862.
- Human Rights Watch. *Canada: Blind Eye to First Nation Water Crisis*. 11 Sept. 2016, [www.hrw.org/news/2019/10/02/canada-blind-eye-first-nation-water-crisis](http://www.hrw.org/news/2019/10/02/canada-blind-eye-first-nation-water-crisis).
- Jackson, Deborah Davis. "Shelter in Place: a First Nation Community in Canada's Chemical Valley." *Interdisciplinary Environmental Review*, vol. 11, no. 4, 2010, p. 249., doi:10.1504/ier.2010.038080.
- Kruvant, W.J. "People, Energy, and Pollution." *The American Energy Consumer*, 1975, pp. 125–167.
- Legacy Management, Office of. "Environmental Justice History." *Department of Energy (DOE)*, 2020, [www.energy.gov/lm/services/environmental-justice/environmental-justice-history](http://www.energy.gov/lm/services/environmental-justice/environmental-justice-history).

- Luginaah, Isaac, et al. “Surrounded by Chemical Valley and ‘Living in a Bubble’: the Case of the Aamjiwnaang First Nation, Ontario.” *Journal of Environmental Planning and Management*, vol. 53, no. 3, 2010, pp. 353–370., doi:10.1080/09640561003613104.
- MacDonald, Elaine. “Clearing the Air in Chemical Valley.” *Ecojustice*, 22 June 2020, [ecojustice.ca/return-to-chemical-valley/](http://ecojustice.ca/return-to-chemical-valley/).
- Maclay, Kathleen. “Clean Vehicle Rebates Benefit Wealthy, White Californians, Study Finds.” *Berkeley News*, 8 Nov. 2016, [news.berkeley.edu/2016/11/07/clean-vehicle-rebates-benefit-wealthy-white-californians-study-finds/](http://news.berkeley.edu/2016/11/07/clean-vehicle-rebates-benefit-wealthy-white-californians-study-finds/).
- Malveaux, Julianne. “Electric Car Tax Credits Subsidize Inequality.” *TheHill*, 13 June 2019, [thehill.com/opinion/finance/438992-electric-car-tax-credits-subsidize-inequality](http://thehill.com/opinion/finance/438992-electric-car-tax-credits-subsidize-inequality).
- Margonelli, Lisa. “California's Green-Vehicle Subsidies Have a Huge, Destructive Flaw.” *Slate Magazine*, Slate, 19 Sept. 2014, [slate.com/technology/2014/09/californias-green-vehicle-subsidies-and-income-inequality.html](http://slate.com/technology/2014/09/californias-green-vehicle-subsidies-and-income-inequality.html).
- Margonelli, Lisa. “California's Green-Vehicle Subsidies Have a Huge, Destructive Flaw.” *Slate Magazine*, Slate, 19 Sept. 2014, [slate.com/technology/2014/09/californias-green-vehicle-subsidies-and-income-inequality.html](http://slate.com/technology/2014/09/californias-green-vehicle-subsidies-and-income-inequality.html).
- Martin, Nik. “Electric Cars: Low Earners May Never Get to Drive One: DW: 20.09.2019.” *DW.COM*, 2019, [www.dw.com/en/electric-cars-low-earners-may-never-get-to-drive-one/a-50517095](http://www.dw.com/en/electric-cars-low-earners-may-never-get-to-drive-one/a-50517095).
- McGuire, Patrick. “The Chemical Valley.” *VICE*, 7 Aug. 2013, [www.vice.com/en\\_ca/article/4w7gwn/the-chemical-valley-part-1](http://www.vice.com/en_ca/article/4w7gwn/the-chemical-valley-part-1).
- McKie, David. “Shifting to Electric Vehicles Requires Economic Incentives, Just Ask Norway.” *National Observer*, 30 June 2020,

[www.nationalobserver.com/2020/06/29/analysis/shifting-electric-vehicles-requires-economic-incentives-just-ask-norway](http://www.nationalobserver.com/2020/06/29/analysis/shifting-electric-vehicles-requires-economic-incentives-just-ask-norway).

McRae, Matthew. “The Story of Africville.” *CMHR*, 2020, [humanrights.ca/story/the-story-of-africville](http://humanrights.ca/story/the-story-of-africville).

Natural Resources Canada. “Clean Growth Program.” *Natural Resources Canada*, Government of Canada, 13 May 2019, [www.nrcan.gc.ca/climate-change/canadas-green-future/clean-growth-programs/20254](http://www.nrcan.gc.ca/climate-change/canadas-green-future/clean-growth-programs/20254).

Natural Resources Canada. “Zero Emission Vehicle Infrastructure Program.” *Government of Canada*, 11 Sept. 2020, [www.nrcan.gc.ca/energy-efficiency/energy-efficiency-transportation/zero-emission-vehicle-infrastructure-program/21876](http://www.nrcan.gc.ca/energy-efficiency/energy-efficiency-transportation/zero-emission-vehicle-infrastructure-program/21876).

Nelson, Jennifer J. “The Space of Africville: Creating, Regulating and Remembering the Urban ‘Slum.’” *Canadian Journal of Law and Society*, vol. 15, no. 2, 2000, pp. 163–185., doi:10.1017/s0829320100006402.

Nobre, Helena, and Gabriel Pedrosa. “Second-Hand Electrical Vehicles: a First Look at the Secondary Market of Modern EVs.” *International Journal of Electric and Hybrid Vehicles*, vol. 1, no. 1, 2018, p. 1., doi:10.1504/ijehv.2018.10016055.

Nova Scotia Communities, Culture and Heritage . “African Nova Scotian Affairs.” *African Nova Scotian Community | African Nova Scotian Affairs*, 2020, [ansa.novascotia.ca/community](http://ansa.novascotia.ca/community).

Palmer, Brian. “The History of Environmental Justice in Five Minutes.” *NRDC*, 18 May 2020, [www.nrdc.org/stories/history-environmental-justice-five-minutes](http://www.nrdc.org/stories/history-environmental-justice-five-minutes).

Pulido, Laura. “Rethinking Environmental Racism: White Privilege and Urban Development in Southern California.” *Annals of the Association of American Geographers*, vol. 90, no. 1, 2000, pp. 12–40., doi:10.1111/0004-5608.00182.

- Rubin, Dana, and Evelyne St-Louis. "Evaluating the Economic and Social Implications of Participation in Clean Vehicle Rebate Programs: Who's In, Who's Out?" *Transportation Research Record: Journal of the Transportation Research Board*, vol. 2598, no. 1, 2016, pp. 67–74., doi:10.3141/2598-08.
- Shapiro, Thomas, et al. Institute on Assets and Social Policy, 2013, *The Roots of the Widening Racial Wealth Gap: Explaining the Black-White Economic Divide*.
- Sister, Chona, et al. "Got Green? Addressing Environmental Justice in Park Provision." *GeoJournal*, vol. 75, no. 3, 2009, pp. 229–248., doi:10.1007/s10708-009-9303-8.
- State of California. "Financing Assistance for Low-Income Consumers." *Moving California*, 2020, [ww3.arb.ca.gov/msprog/lct/vehiclefinancing.htm](http://ww3.arb.ca.gov/msprog/lct/vehiclefinancing.htm).
- Sunter, Deborah A., et al. "Disparities in Rooftop Photovoltaics Deployment in the United States by Race and Ethnicity." *Nature Sustainability*, vol. 2, no. 1, 2019, pp. 71–76., doi:10.1038/s41893-018-0204-z.
- Szasz, Andrew, and Michael Meuser. "Environmental Inequalities: Literature Review and Proposals for New Directions in Research and Theory." *Current Sociology*, vol. 45, no. 3, 1997, pp. 99–120., doi:10.1177/001139297045003006.
- United Nations. "Exposure City Level 2011." *Global Health Observatory Data Repository*, 2011, [apps-who-int.proxy.library.upenn.edu/gho/data/view.main.AMBIENTCITY2011?lang=en](https://apps-who-int.proxy.library.upenn.edu/gho/data/view.main.AMBIENTCITY2011?lang=en).
- Walker, James. "Allegories and Orientations in African-Canadian Historiography: The Spirit of Africville." *Dalhousie Review*, vol. 77, no. 2, 1997.
- Wiebe, Sarah Marie. "Guardians of the Environment in Canada's Chemical Valley." *Citizenship Studies*, vol. 20, no. 1, 2015, pp. 18–33., doi:10.1080/13621025.2015.1075470.

Winegarden, Wayne. "Subsidies for Electric Vehicles Favor the Wealthy." *Pacific Research Institute*, 12 Mar. 2018, [www.pacificresearch.org/subsidies-for-electric-vehicles-favor-the-wealthy/](http://www.pacificresearch.org/subsidies-for-electric-vehicles-favor-the-wealthy/).

Xing, Jianwei, et al. "What Does an Electric Vehicle Replace?" 2019, doi:10.3386/w25771.

Yi, Chang. "Impact of Public Transit on Employment Status." *Transportation Research Record: Journal of the Transportation Research Board*, vol. 1986, no. 1, 2006, pp. 137–144., doi:10.1177/0361198106198600117.

Zupan, Jeffrey M. *The Distribution of Air Quality in the New York Region*. Resources for the Future; Distributed by Johns Hopkins University Press, Baltimore, 1973.