

Access*: Interdisciplinary Journal of Student Research and Scholarship

Volume 9 | Issue 2

Article 3

2025

Climate Change and Carbon Emissions: The War Against Ourselves

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Recommended Citation

Appleby, Gabriel A. (2025) "Climate Change and Carbon Emissions: The War Against Ourselves," *Access*: Interdisciplinary Journal of Student Research and Scholarship*: Vol. 9: Iss. 2, Article 3.

Available at: <https://digitalcommons.tacoma.uw.edu/access/vol9/iss2/3>

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Cover Page Footnote

Article composed with editorial assistance from Tyler Appleby

Abstract

Within the past century, carbon-emitting vehicles have become an integral part of modern life. However, the automobile industry's exponential growth has introduced a significant source of greenhouse gases, exacerbating environmental issues. In the fight to decrease carbon emissions, it is the responsibility of the individual to make the difference. But just as the prisoner's dilemma displays a lack of trust between said prisoners, there continues to be a lack of trust between the people of this world who have the ability to make a difference. A possible solution to this dilemma is for community groups to implement and advocate policies such as the general use of electric vehicles and bicycle-only zones. The whole world will not change at once; for change to be realized effectively and efficiently, it must begin with small efforts from individuals and local communities.

Keywords: climate change, carbon efficiency, automobile emissions, green power, environmental protection, community organization, alternative consumption

Climate Change and Carbon Emissions: The War Against Ourselves

From driving two miles to the grocery store in search of a carton of milk to soaring over the Atlantic in a winged, mechanical beast, automobiles of all kinds have enabled humankind to survive, thrive, and develop for over a century. Unfortunately, our burdened planet Earth has not shared in those benefits. According to Gebre (2016), “[vehicles are] one of the major sources of greenhouse gas emissions like carbon dioxide, sulfur dioxide, nitrogen dioxide, and particulates, which are the major contributors to the global climate change” (p. 1). Despite the associated risks, automobiles have become so ingrained in our society’s DNA that minimizing harmful emissions in any impactful way appears to a singular citizen as Sisyphus’s boulder; we can strain and push all we want, but meaningful progress always remains out of reach, with or without government intervention.

One analytical perspective that can be applied to this issue is the tragedy of the commons, which follows the logic of the prisoner’s dilemma: a theoretical scenario where two prisoners must decide between snitching on each other or keeping silent. If both prisoners stay silent, they are each rewarded with a shorter sentence. However, if only one snitches and the other says nothing, the snitch will walk free, leaving the other prisoner to rot in jail. The dilemma in question boils down to whether or not the two prisoners trust each other. Without knowing the other’s actions, the prisoners are unable to trust each other, and it is likely that both will snitch. As a result, both prisoners end up with heavy sentences.

In the tragedy of the commons, the prisoner's dilemma is applied to the idea of common property. Common property can be defined as something that is difficult for any one person to own, such as the ocean or air—resources that are essentially impossible to sector off or privatize. We share this world with billions of other people and cannot realistically trust every other person in the world to do their part. Nobody wants their altruism to be exploited, so nobody makes the necessary sacrifices. As a result, everybody continues to take advantage of the common property, turning a blind eye to their own reckless pollution of the Earth.

The effect of automobile emissions on the environment is a pressing issue and a frequently observed example of the tragedy of the commons. Shyam Sundar et al. (2017) conclude that “this elevated level of carbon dioxide in the atmosphere due to emissions from automobiles may significantly contribute to increase the global warming. The burden of global warming could be reduced significantly, if the emission from automobiles is restricted” (p. 8). In theory, ceasing or even decreasing our use of carbon-emitting automobiles is the best course of action, leading to a healthier environment and a brighter future. However, to boycott planes, trains, and automobiles is to displace ourselves into discomfort and inconvenience. With only a feeble faith that many others will follow our example, the mutual trust on which success relies seems to be out of reach.

Despite the inherent “tragedy” in the tragedy of the commons, there is hope. Rather than expecting the whole of Earth's population to make a change all at once, smaller coalitions of dedicated individuals could collaborate to reduce their use of automobiles with “institutions.” Institutions in this context can be defined as rules or

social norms that are not officially recognized or enforced by the government but are instead adopted by the people who created them for the purpose of governing their own collective actions in regard to a given issue. An example of an institution that could assist in reducing automobile emissions is the use of electric cars for everyday commuting and errand-running. If utilized more widely, electric cars have the chance of drastically decreasing humankind's carbon emissions. This practice would have to be normalized in small communities, and as more communities participate, the positive impact on the atmosphere would burgeon.

Admittedly, however, another necessary piece of the puzzle to consider is the emissions from large manufacturers and power plants. According Nakamoto et al. (2024), along with "setting fuel efficiency standards, green power generation will play a crucial role in reducing emissions associated with the widespread use of EVs [electric vehicles]" (p. 8). The fuel efficiency standards and green power generation that Nakamoto et al. suggest would necessarily be enforced by the government, and therefore would occur outside of institutional change rooted in community participation. Such standards must be established to incentivize the use of clean energy sources instead of fossil fuels for powering and manufacturing electric vehicles and to prevent companies from cutting costs by using less green manufacturing practices but change first at the community level can also help inspire or promote those incentives.

Given that electric vehicles have great potential as a green alternative to their gas-burning counterparts, why do people not flock to this convenient solution? The answer to this conundrum is multifaceted. While electric vehicles have lower fuel costs, no carbon emissions from gasoline or diesel, and cheaper maintenance, they also have

more limited driving ranges—due to a lack of battery longevity—longer refuel wait times, and a more significant cost than the average carbon-emitting vehicle. Additionally, most areas of the world do not use clean sources of electrical energy, continuing carbon emissions in another format.

Wong (2025) of MarketWatch comments on the affordability of electric vehicles: “The majority of middle- and low-income Americans have largely missed out on the recent EV boom.” Although electric vehicles are healthier for the environment and less expensive in the long run, they are less convenient and come at a higher price for the consumer. The decision to invest in an electric vehicle is a difficult one, and many consumers will opt on the side of personal cost-savings rather than environmental sustainability.

A lower-cost potential solution is the enactment of bicycle-only rules in specific areas. Song et al. (2024) write, “carbon emissions are steadily increasing, with notable disparities among urban [areas]” (p. 20). In urban areas, amenities are often more localized and accessible without a need for automobiles, which makes urban bicycling an affordable alternative to investing in an electric vehicle. In regard to suburban environments, local groups—such as Homeowners’ Associations—could adopt bicycle-only policies for their communities. By creating and regulating these rules, participating communities could generate enough social pressure through an influx of new and ubiquitous norms to significantly reduce the excessive use of automobiles in their local areas.

According to Vallarta-Serrano et al. (2023), “cities consume most of the energy used worldwide and are the largest emitters of greenhouse gases (GHGs) that cause

global warming” (p. 1). Yet outlying suburban sectors of those cities are also a major factor of the carbon emissions problem. Who truly has the power to make an impact in these areas? It is fundamentally in the hands of the citizens; those living in the suburban areas have the power to make a change to vehicle carbon emissions. This relates to the central goal of Homeowners’ Associations, which are designed to utilize the latent power of suburban inhabitants to affect their communities through a more formal organizational system. Vallarta-Serrano et al. (2023) claim that “a combination of a BEV [battery electric vehicle] with E-bikes generates fewer emissions . . . than the diesel counterpart” (p. 16). One way that Homeowners’ Associations should be working to reduce their vehicle carbon emissions is through the creation of bicycle-only or electric vehicle-only zones within their areas of influence. However, this does not often happen, likely due to climate change not appearing as an immediate threat to living conditions and not having the same correlation to fiscal consequences as issues like the quality of roads or property value. Even so, the solution to this problem lies largely in the hands of the people. Residents of these neighborhoods need to take responsibility and vocalize concerns to their HOAs of the long-term effects of this worsening situation.

Despite these proposed solutions, there remains the underlying problem: “In countries with a high electrical emission factor due to the consumption of fossil fuels for power generation, electric vehicles might pollute more than an ICE [internal combustion engine]” (Vallarta-Serrano et al., 2023, p. 16). This problem emphasizes how important it is to find other ways of producing electrical power other than the burning of fossil fuels. In industries that rely on fossil fuels, changes must be effected both at the corporate and governmental levels for any dent to be made in the issue. Citizen

organizations such as HOAs or civic associations can contribute to such changes by developing and presenting legislative initiatives to leadership that push a transition to cleaner energy, which is quite possibly the only way to combat the most powerful foe in this battle: widespread bureaucratic apathy.

History has demonstrated that change is possible with the combined power of citizen activism and government regulations. One example of this approach succeeding is the Love Canal protest, which centered around a partially-excavated canal in Niagara Falls, New York. After the project was unfortunately cancelled, the canal was repurposed as a government-sanctioned location for the dumping of toxic chemical waste. As would be expected, this practice gave rise to severe health problems within the nearby neighborhoods. Kleiman reported, “door-to-door health surveys began to reveal a series of inexplicable illnesses—epilepsy, asthma, migraines, and nephrosis—and abnormally high rates of birth defects and miscarriages” (Kleiman). Upon discovering the source of these health problems, a local resident, Lois Gibbs, founded a Homeowners’ Association in protest. With the help of other local residents, Lois was able to form a movement to advocate against the chemical dumping. After a long battle against the legislation, the Love Canal Homeowners’ Association succeeded in their objective. The government established the Superfund Law, also known as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which gives the Environmental Protection Agency the power to respond to uncontrolled and abandoned hazardous waste dump sites in the future. The diligent efforts of a few concerned individuals radically changed national environmental policy.

Given the pandemic nature of the tragedy of the commons, globalized trust and cooperation in the reduction of automobile emissions—though possible, as evidenced in the Love Canal protest—will be difficult to cultivate. Santos and Pacheco (2011) remind us that “instead of large-scale endeavors involving most of the population . . . the joint combination of local agreements within groups that are small compared with the population at risk is prone to significantly raise the probability of success” (p. 1). Changes in many small areas can culminate in larger movements, whether it be normalizing the use of electric vehicles rather than gas-powered or restricting the use of automobiles in specific areas in favor of bicycles. The creation and enforcement of these institutions will be difficult, and it may often seem impossible for individuals to make a difference. Nonetheless, it is imperative that we continue to fight against our own tendencies toward complacency. The only true way to eliminate the tragedy of the commons is to start small: focus on your own actions, develop agreements with your neighbors, and design and propose emission-reducing initiatives to your local community organizations. Even our most Lilliputian efforts, though they may seem insignificant at the time, can have lasting impacts in years to come. After all, it only takes a pebble to start a landslide.

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