

Building a Greener Future: A UW Research Report
into Seattle's Climate Justice Movement

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THE ENGLISH 121 CLASS

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Contents

<u>What is this book?</u>	1
 <u>Part I. Main Body</u>	
1. <u>Environmental Health Disparities in Seattle</u> <u>Madison Powell</u>	5
2. <u>Food Security and Agriculture</u>	11
3. <u>Colonialism and Climate Change</u> <u>Princess Uzoma</u>	16
4. <u>Disproportionate Impacts of Climate Change</u> <u>Julina Lang</u>	20
 <u>Part II. Energy Systems</u>	
5. <u>Cap and Trade and Carbon Offsets</u> <u>Owen Enck</u>	27
6. <u>Dollars and Sense</u> <u><i>The Rationale Behind Subsidies for the Energy Industry</i></u> <u>Michael Albrecht</u>	35
 <u>Part III. Housing and Climate Justice</u>	
7. <u>Green Architecture & LEED Certification</u> <u>Sofia Christophel-Lichti and Warren Lloyd</u>	49

8. <u>False Solutions Vs. Real Solutions</u>	53
<u>Yixin Zhang</u>	

[Part IV. Puget Sound Ecology](#)

9. <u>Water-Cycle</u>	61
<u>Jason Wang</u>	
10. <u>Ocras in Puget Sound</u>	63
<u>Tyler Wu</u>	
11. <u>Climate Change and its Impacts on Salmon and Wildlife</u>	68
<u>Esha Gollapalli</u>	
12. <u>So... What Does Ecology Have to do With Seattle?</u>	73
<u>Mikaela Williams</u>	

[Part V. Organizing Efforts](#)

13. <u>Companies VS. Climate Change: Priority or PR?</u>	81
<u>Ayushi Desai</u>	
14. <u>Student Strikes and Walkouts</u>	90
<u>Micah Glasby</u>	
15. <u>Activism through Art</u>	94
16. <u>#noLNGTacoma</u>	99
<u>Phong Luu</u>	

<u>Works Cited</u>	103
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Designed and composed by English 121 students at the University of Washington, this book is intended to introduce UW students and members of the Seattle community to the climate justice movement in the Pacific Northwest.

PART I

MAIN BODY

I. Environmental Health Disparities in Seattle

MADISON POWELL

You've probably heard that Seattle summers make up for the cold, rainy months of the year, with near perfect weather, bright blue skies and views of Rainer. But this past September that was not the case. In early September smoke and ash from wildfires raging in Eastern Washington and Oregon flooded the Seattle area, bringing one of the worst air quality indexes Seattle has ever seen and posing a serious threat to human health amidst a global pandemic.



Smokey Seattle skyline by SounderBruce

While climate change isn't a direct cause of the wildfires seen this past summer, the increasing numbers of fires seen each year are consistent with the changing climate.



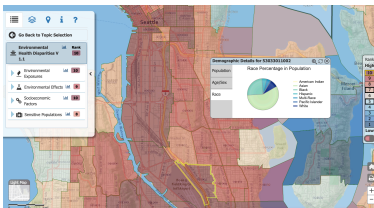
Current climate models predict that by the 2040s the Pacific Northwest “could lose up to 1.1 million acres due to wildfires,” (Washington State Department of Ecology). Rising temperatures, dry summers, early snowmelt, and beetle kill all contribute to this statistic. Wildfires add PM 2.5 particles into the air which are pollution particles so small that our body can’t filter them. These particles end up in our lungs and blood stream and impact our health. Exposure to these particles can create mild symptoms such as headaches, irritation of the throat and eyes, but for those with underlying health conditions such as asthma and other respiratory conditions, the effects of the smoke can be much worse, even life-threatening. In low-income communities and communities of color, the risk is even higher. According to the American Lung Association, studies done in the Medicaid-eligible population have shown that “those living in predominantly black or African American communities suffered greater risk of premature death from particle pollution than those in predominantly white communities,” (Disparities) Seattle is no exception.

The [lack of affordable housing](#) within the city has forced many low-income people to move to the suburbs, often along the highway where exposure to harmful toxins and pollution is higher. The CDC says exposure to traffic pollution can have negative effects on your health such as



the I5 highway in Seattle

decreased lung function, cardiovascular disease, and making asthma symptoms worse (Community Design). Increased exposure to traffic pollution in conjunction with wildfire smoke intensified the already existing health disparities within these communities.



This is the census area near the Boeing Air Field that also happens to lie along the I5 highway route. It shows the area ranking the highest for environmental health disparities and environmental exposure. It also shows the race percentages for the population.

An [interactive map](#) on the Washington State Department of Health's website ranks areas of Seattle on environmental health disparities, with 1 being least impacted and 10 being the most impacted. Environmental health disparities exist when communities are disproportionately impacted by the quality of the environment and therefore have more health

problems. The map also shows environmental and socioeconomic factors that contribute to these rankings. One census area near the Boeing airfield and the I-5 highway ranks 10 for environmental disparities. The population of this community is 58% Asian and 25% Black and also has a large population of people living under the poverty level. These populations are already more vulnerable to health problems. In the report *Our People, Our Planet Our Power* by the Seattle organizations Got Green and Puget Sound Sage, it is stated that "In King County, asthma prevalence among Asian, Black

and multiracial youth is higher than white and Hispanic youth,” (Got Green).

Another example of an environmental health disparity is a direct cause of hotter summers. The rising summer temperatures is one of the most apparent impacts of climate change, especially in Seattle. Six of the seven hottest summers in Seattle have occurred in the last seven years. (Sistek) This past summer King County launched a project to map the areas that are impacted the most by the heat. According to King County, “the temperature between city blocks can vary by as much as 20 degrees Fahrenheit due to differences in the amount of paved surfaces and tree canopy,” (Lewis). Hot weather can cause conditions like heat cramps, heat exhaustion, and trigger asthma and cardiovascular problems for those with underlying conditions. The heat also amplifies pollution, worsening respiratory problems and asthma. Escaping the heat can be difficult. Many homes in Seattle don’t have air conditioning and installing air conditioning can be a large cost that many can’t afford. Wealthier neighborhoods in Seattle also have 29% tree coverage compared to 18% in low-income neighborhoods (Got Green). Thus, low-income neighborhoods are disproportionately affected by the heat and the impacts it has on one’s health.

These reasons and many more prove just how important the climate justice movement is, but also the racial



justice movement. Without racial and class justice, climate justice is not real justice, only a [false solution](#). We need to turn our attention to improving our everchanging climate while also ensuring that those in low-income neighborhoods and communities of color aren't forgotten about, since they are the ones that feel the impacts of climate change the most. Metronome's clock in Manhattan, New York reads the time we have left before the impacts of climate change become irreversible. 7 years. 7 years until the summers get hotter, the pollution gets worse, sea levels rise, and we can't do anything about it. The good news is we still have time. Climate change is not just an issue about our planet, but human lives and the health of our communities.

Media Attributions

- Smokey_skyline_view_of_Downtown_Seattle_from_Rizal_B

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2. Food Security and Agriculture

Food Insecurity

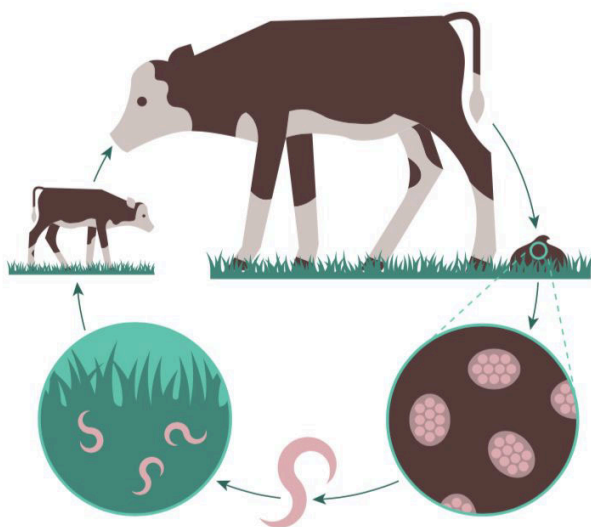
Food prices in grocery stores rise incrementally each year leaving people with food insecurity. This is especially an issue in Seattle where the grocery stores are one of the most expensive in America.(Seattle Gov.) Climate change is predicted to make the prices steeper because as the seasons change, it will be harder for farmers to grow crops that are in demand.(ucsua) This means that the cost of fresh produce will rise, the cost of meat will rise because crops are required to feed those animals and there will be more instability in the supply chain. This issue disproportionately burdens people of color and low-income households.(got green, Puget sound sage) We need to make good quality food more affordable by reducing climate change so that everyone has a way to buy food that is good for them without running out of money. To learn more about the disproportionate effects of climate change you can go [\[https://uw.pressbooks.pub/121climatejustice/chapter/disproportionate-impacts-of-climate-change-2/\]](https://uw.pressbooks.pub/121climatejustice/chapter/disproportionate-impacts-of-climate-change-2/)

Effects on Weather

In order to understand how food prices rise, it is important to know how agriculture gets affected by the rise in climate. Higher temperatures have some effects on the weather such as more rainfall accompanied by heavier flooding, and longer droughts. (USDA, EPA) Rainfall and flooding cause soil erosion and water pollution. These things and the fact that water from the flooding can drown crops hurts yields on the coast and other agricultural regions such as the Midwest.(ucsusa) Drought can affect the farming of both livestock and crops. Crops grow best at a certain temperature so farmers will choose which crops to grow based on the temperature where they live so that they have the chance to produce the best

yield of their plant. The optimal temperature of the plant will not change with the change in climate so plants may grow earlier in the year. For example, in a repost from the EPA they say “in 2010 and 2012, high nighttime temperatures affected corn yields across the U.S. Corn Belt, and premature budding due to a warm winter caused \$220 million in losses of Michigan cherries in 2012”(citation). Droughts and higher temperatures effect livestock because the production of their food supply is reduced by the high temperatures, and heat stress can cause death, lower yields of milk, lower fertility and decrease the animal’s immune system. Another example from the EPA states “In 2011, exposure to high temperature events caused over \$1 billion in heat-related losses to agricultural producers”. The higher temperatures have also caused fish to move north of the united states to find colder water. When the fish move into new waters they will compete in a new ecosystem, disrupting the other species that live there and also possibly worsening their chance for survival because they have to find food and space to live in a different environment. The life cycle of fish is also controlled by temperature so this means the time of their migration and reproduction could change . To learn more specifically about salmon extinction, you can go here [<https://uw.pressbooks.pub/121climatejustice/chapter/environmental-impacts-on-salmon-and-wildlife/>]

CO2 Levels and Disease



Plants use CO₂ so an increase in CO₂ can cause some crops to grow faster however this also comes with a better environment for weeds, parasites, and fungi to grow which will steal nutrients from the crops.(EPA) It has also been shown that more CO₂ can cause plants to lack nutrients such as protein.(EPA) More CO₂ causes this same effect to livestock because the warmer environment can increase the amount of parasites that can infect livestock and the lack of nutrition in the plants that the livestock will eat means that the animals must eat more volume of their food to get the same nutrition. And finally, more CO₂ affects fish because it makes the ocean more acidic causing shellfish shells to be less sturdy. (EPA)

How do Rising Food Prices Hurt Communities in Seattle?

In Seattle, multiple sources report that about 13% of households are food insecure which means that a decent proportion of people living in Seattle have struggled to have the money to buy enough food to sustain themselves. (Seattle Gov, Got Green, Puget Sound Sage) Of this 13%, it was found by a study from the Seattle government that higher rates of marginalized communities

were affected by food security. For example in the report it states “Although no gender differences were found among adults or school-age children, rates of food insecurity were two times higher among individuals who identified as lesbian, gay, or bisexual (LGB) than among those who identified as heterosexual.” In these marginalized communities it is also harder for them to get access to healthy foods. This is not only because of food deserts and prices but also because less chain grocery stores build stores in these communities.



A video element has been excluded from this version of the text. You can watch it online here:

<https://uw.pressbooks.pub/121climatejustice/?p=389>

These statistics relate to climate change because as the weather gets worse and worse for agriculture, the prices of these goods will get higher as they become harder to produce. These prices will disproportionately affect families and communities who are already worse off because of low income and/or because they are marginalized,(Got green, Puget Sound Sage) and it will give wealthier people an exponential advantage against climate change. Naomi Klein explains how this happened from war reconstruction efforts in her book on fire and says “If we defer to central governments in that way in the face of the climate crisis, we should expect highly corrupt measures that further concentrate power and wealth in the hands of a few big players, not to mention systemic attacks on human rights, a phenomenon I have traced repeatedly in my work on disaster capitalism in the aftermath of wars, economic shocks, and extreme weather events”. If we as the citizens neglect climate change as an issue and just let whatever government we have make an attempt to fix it, people who are already struggling

could end up in a worse situation and those who aren't will reap the advantages.

How are People Helping?



Got green helped to get Seattle to pass a sugary drink tax. While they are following seven other cities on this tax, they are the first to suggest that the money from this tax be put into trying to close the food security gap and helping to get healthy food to people. Got Green's Sweetened Beverage Tax helps to fund a program called Fresh Bucks and the Healthy Food Availability & Food Bank Network Report for Seattle.

Fresh Bucks was created to help low income people get access to healthier foods by giving them vouchers at farmers markets and the like. SNAP helps to reduce food insecurity as well but some people do not qualify for SNAP so Fresh Bucks is an option for them to get food and for that food to be healthy.

3. Colonialism and Climate Change

PRINCESS UZOMA



What's

colonialism you may ask? Colonialism is the dominance of a stronger nation over a weaker nation. From the European colonial perspective, colonialism is a practice of obtaining control over other land and communities while exploiting it economically. Conquest has been a thing since the earliest civilizations, and its ideology is the root cause to the damaging climate crisis. Why? Because it comes along with the idea that everything on earth is here to be claimed and extracted, bought and sold.



Amazon employees walkout at the Amazon Spheres during a Climate Strike march in Seattle, WA.

One could say that it is fairly ignorant that someone can ignore the fact that colonization is the leading cause to the catastrophes of climate change. On the contrary, a great deal of guilt-trip appeals for the world to take alternative means of transportation in order to 'save the world' only addresses the

least of the world's problems . The real damage is in the hands of industrial corporations that are responsible for the highest percentage of carbon emissions. In a GQ article by Luke Darby "Billionaires are the leading cause to climate change", it noticeably argues that the United States richest 1% are actively colonizing the world even as "we're well past the point of preventing climate change" (Darby). However, if called upon, our leaders have around "12 years to prevent the most catastrophic elements of it from wreaking havoc on the world's population" (Darby). Here is where we connect the dots. From our perspective the leading corporations on the industrial level, the colonizers in our terms, are to be held accountable through their practices of enriching a small percentage of communities through the labor and pollution of the rest. Otherwise stated, these poor communities are rather powerless to these industries treating them as a business plan, as they continue to further expand their assets. In a book written by Naomi Klein titled *On Fire*, Klein was keen to notice that it is not as if history repeated itself, because the concept was never lost, rather they are "fundamental myths, woven deep into national narratives" (Klein 20), an idea first brought upon the nations for the colonial powers that were running out of nature to exhaust at home" (Klein 20). It is clear that these big corporations possess the colonial ideology that comes along with the theories that justified treating humanity as capital assets to exhaust their labor and exploit without limit, is still

the same theory that now justifies treating the earth the same way. In relation to current climate colonialism, we see how the government has turned a blind eye to these industrial companies that have led our climate to a damning global crisis, while ruining poor communities as a direct result of the conception of a wealthier lifestyle.

As Washington is facing requests for new gas proposals, Tacoma is the proposed home for a liquid natural gas (LNG) refinery, to be built by Puget Sound Energy (PSE). The people of the Puyallup Tribe are strongly opposed by the proposal for the LNG refinery.



Local groups and environmental group members peacefully protest the pipeline construction.

This proposal clearly violates the tribe's treaty rights and once again we witness colonialism at the hands of big corporations. To these corporations, it is just another new way to pressurize gas into a liquid form, meaning more income, and distribution for consumption. However, these companies fail to realize the detrimental effects of natural gas. The Puyallup Tribe took it upon themselves to defend their areas and the community, since Governor Inslee's rhetoric led to him taking no action in stopping the PSE. According to 350 Seattle, Governor Inslee made his remark on the proposal claiming he "cannot in good conscience support continued construction of a liquified natural gas plant" (350 Seattle), yet proceeds to not prevent the construction of the plant. Again with the empty promises and false hope the leaders of our nation give, which Klein once states, have led the youth's verdict of these liberal leaders "to be just as damning, if not more so" than their verdict on conservative leaders (Klein 6). Governor Inslee's act on taking action, or lack thereof, could lead to the accelerating breakdown of the climate. If action is not taken, the majority Tacoma community will possibly have to deal with the risks associated with a gas line constructed only half a mile away from

humanity. Not only will this building of the gas line be hazardous, but it is also not going to be cheap. The construction of LNG will be very expensive and these costs will be mainly covered at the cost of residents in the form of price increase in many homes and small businesses. The government's ignorance to the outweighing negative effects of this proposal exemplifies the colonial narrative of exploiting communities, while disregarding the dangers the community will phase. Not only will this affect the people of Tacoma, but their acts of ignorance are quickly contributing to the global crisis. [Link to [#NoLNG Tacoma chapter](#)]

Media Attributions

- Colonialism © Polyp.org.uk
- Amazon Employees Strike © Lindsey Wasson/Reuters
- © 350 Tacoma

4. Disproportionate Impacts of Climate Change

JULINA LANG

Introduction

Although climate change has always been emphasized as a science concern by accentuating data over personal adversities; environmental justice organizations, Got Green and Puget Sound Sage, explains that “climate change stories do not reflect people of color as stakeholders or agents of change” (Got Green and Puget Sound Sage). Got Green and Puget Sound Sage are non-profit and environmental justice organizations based in South Seattle, WA. These organizations work to provide a green and equitable lifestyle to compensate for the disproportionate impacts of climate change on low income communities and communities of color. These two organizations together have led a community research, “Our People, Our Planet, Our Power” on the challenges and imperfections within the broken climate justice movement. Throughout this research, these two organizations have discovered that in order to resolve the broken pieces within this climate movement, it is vital to revolutionize how we think and educate others about climate change by approaching its disproportionate impacts and emphasizing why it is important to do so.

The Key Issue

Thinking about the climate crisis today as a threat multiplier needs to expand within and beyond these communities that are being disproportionately impacted. But, what does it mean if the climate justice movement themselves does not take this into account? According to “Our People, Our Planet, Our Power”, these organizations created a survey asking climate vulnerable communities who they believe to be most impacted by climate

change. Their survey discovered “that while people of color and low-income residents overwhelmingly support environmental interventions, they don’t immediately see themselves as disproportionately affected by climate change. Only 24% of our survey respondents thought low-income people or people of color would be most impacted.” (GG and PPS) This finding has exposed a key issue within the climate justice movement. Not only that this climate movement failed to acknowledge the disproportionate impacts of climate change but they have completely failed to spread this message and awareness on this issue entirely. This finding has brought to light the many flaws to this broken movement and how influential it will become to transform the way we talk about climate change.

Intersectionality within the Climate Crisis

To find justice within this movement, it’s important to approach these disproportionate impacts and to think about how climate change has worsened these socioeconomic issues. Got Green and Puget Sound Sage are two of the many organizations here in Seattle, WA, working to alleviate these impacts on climate vulnerable communities. According to their community led research, “Our People, Our Planet, Our Power”, climate change has had “disproportionate impacts to low-income communities and communities of color at local, national, and international levels have been widely documented” (GG and PPS). Climate change impacts socioeconomic factors like displacement, food insecurity, and public health issues; all of which are expanding disparities amongst communities not only here in Seattle but also around the world. These organizations have discovered through their research that it will be extremely difficult for these communities to navigate towards climate justice without the foundation and stability that they could have through affordable housing, a stable food security, etc. (More information on affordable housing: <https://uw.pressbooks.pub/121climatejustice/chapter/climate-justice-affordable-housing/>). (More information on food insecurity:

<https://uw.pressbooks.pub/121climatejustice/chapter/food-security-and-agriculture>). In order to shift the climate change movement towards equity is to think about its intersectionality with these socioeconomic issues. This intersectional concept applies to all disproportionate factors like public health issues and racial inequity; all of which have become just as urgent and significant to approach along with the climate change movement.

Diversity and Inclusion

To progressively form equity within the climate justice movement is to increase and change the way we educate others about climate change. By approaching climate change and its intersectionality with other issues, educating others about the disproportionate impacts in climate change will help fill in the unequal gaps within this broken movement. Doing so, will deliver the real message of what is at stake due to climate change. Promoting education within these climate vulnerable communities will set the success for a more just movement. This will extremely help engage advocacy and leadership from communities of color which is necessary in order to achieve equity. If the climate change movement continues to progress without the voices and leaders of those from climate-vulnerable communities, issues and disparities within these communities will continue to go unnoticed. Got Green and Puget Sound Sage described this as “when marginalized people do not have a seat at the table, the cycle of institutionalized environmental racism is perpetuated.” (GG and PPS) We need to embrace the voices of those who have been oppressed and encourage the further education that could bring us towards a more diverse and just movement.

The Bigger Picture

Thinking about climate change and its intersectionality with other issues, how long ago can we assume this relationship has been intertwined since? As early as the history of colonialism, it is something that is extremely crucial to keep in mind and educate

ourselves about when hoping to understand our climate crisis. We have learned about the “national narratives” that have been stemmed into history and intertwined ever since the colonization by Europe. For example, author and climate activist, Naomi Klein, explains that the ideas of “new discoveries” and “nature’s boundlessness” has become the mindset we see today as the main drive of our climate change, (<https://uw.pressbooks.pub/121climatejustice/chapter/colonialism-and-climate-change/>).

Learning about how deeply rooted this issue has become and progresses today, it is extremely significant to approach other deeply rooted issues like systemic racism and structural inequities when thinking about a shift in our climate change. Climate change is a threat multiplier and approaching these issues by attacking our systemic construct and foundation will build racial and social equity into the climate justice movement. Doing so will alleviate the disproportionate impact and burden climate change has on these low-income communities and communities of colors. Transforming the way we think, educate, and talk about our climate change movement will essentially alter the direction of this climate justice movement towards equity.

PART II

ENERGY SYSTEMS

5. Cap and Trade and Carbon Offsets

OWEN ENCK

Cap and Trade

– A system maintained to limit and price harmful emissions, utilizing a two-part approach to reduce pollution in the atmosphere.

Details of the Two-Part System

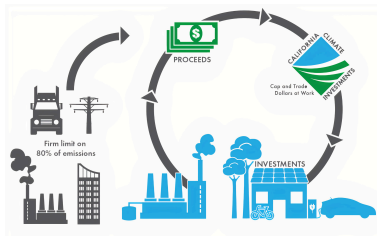
Cap:

A governing body sets a limit to the amount of carbon dioxide and related pollutants released into the atmosphere. This “cap” is set over a specific industry, comprising companies an “allowance” determining the quantity of emissions they are permitted to release. Over time, the maximum level of emissions a company may output declines, “providing a growing incentive for industry and businesses to reduce their emissions more efficiently, while keeping production costs down” (Environmental Defense Fund).

Trade:

A market is formed for businesses to buy and sell their allowances, encouraging companies to reduce emissions to generate additional income whilst lessening harm to the environment. Comparatively, companies that want to circumvent this constraint may acquire other’s allowances to increase the quantity of emissions they can release. The allowances they purchase can only supplement a specified percentage of their initial output stipend so that pollution output is still regulated.

Cap and Trade in California



Cap and Trade Program, California Air Resources Board. (Photo: CARB.ca.gov)

Cap and Trade has been extensively utilized in California, extending over “350 businesses (600 facilities) representing 85% of California’s greenhouse gas emissions” (McPherson). In this instance, the program provides each business with specific allowances covering a large

portion of their emissions. If a business wishes to increase their emission limitations, they must either buy allowances or offset credits (in California, up to 8% of their total emissions, see section “Carbon Offsets” below).

According to The Center for Climate Change and Energy Solutions, through the implementation of this program, “Revenues that California receives from the program are deposited into the state’s Greenhouse Gas Reduction Fund and then appropriated to state agencies to implement programs that further reduce greenhouse gas emissions.” Additionally, approximately one-third of these revenues are directed towards “disadvantaged communities”, resources distributed towards “increased affordable housing opportunities; improved mobility options through transit, walking, and biking; cleaner air through zero-emission vehicles; job creation, energy and water savings; and greener, more vibrant communities” (California Climate Investments).

Concerning the possible environmental impacts of this system, greenhouse gas emissions in California have decreased by “5.3 percent from the start of the program in 2013 to 2017” (CCCE). While it is difficult to discern whether this improvement is a direct outcome of Cap and Trade, the generated billions of dollars

reinvested into environmental sustainability projects likely contributed to reduced emissions.

What are the Benefits?

One incentive of Cap and Trade is that the system produces massive revenue for local governments, allowing for strategic allocation of generated funds to address the climate change issue.

Another advantage is that a portion of revenues is allotted, as seen through previous implementations, towards assisting low-income communities and those affected by polluting companies.

This strategy provides local governments with the resources to improve their communities, specifically those most in need and experiencing the detrimental effects of rising carbon emissions.

Criticisms of Cap and Trade

Although Cap and Trade has seen previous success, various Seattle-based environmental groups oppose the implementation of this system. One such group, 350 Seattle, points towards one glaring issue with Cap and Trade, citing that with California's implementation of the system, "Many of the most polluting corporations have actually increased their pollution since the program came into effect. Oil refineries, gas corporations, fossil fuel-hooked utilities: all have increased their greenhouse gas emissions and related pollution since 2013." Because companies can trade allowances to produce more emissions, many companies continue to release the same or a greater amount of pollutants into the environment, adverse side effects continuing to affect surrounding communities.

In Seattle, **disadvantaged communities** ([link to Disproportionate Impact of Climate Change](#)) already face difficulties from these pollution-heavy companies. For example,

many residents in South Seattle endure the pollutants of the “Ash Grove” cement plant, which “accounts for 10% of...overall emissions and massively contributes to the fact that south Seattle residents are three times more likely to have asthma than those who live in the north” (350 Seattle). If harmful emissions of companies like Ash Grove will not decrease due to the flexibility of the Cap and Trade system, local communities will still face health risks.

In accordance with 350 Seattle, Got Green, another local Seattle environmental group, expressed their concerns for this issue, noting that “communities living next to oil refineries, fossil fuel power plants and other carbon-intensive industries” will still be forced to live in unhealthy, polluted ecosystems.

Carbon Offsets

– A manner of contribution where the buyer of an “offset” or “offset credits” funds projects to reduce carbon emissions or other greenhouse gases to compensate for emissions made elsewhere.



*Greenfleet's forest at Point Sturt, SA
9-10 years after planting – June 2014*

There are various types of carbon offsets that a person or company may purchase, groups offering buyers different options that all emphasize reducing pollution or counteracting its harmful effects upon the planet. In this manner, carbon offsets are a flexible solution to contest climate change, for while the

creators of projects choose how to lessen climate change most effectively, resources for completing their goals are acquired through third-party funding.

With some offset projects, companies bound by pollutant-limiting requirements, such as with Cap-and-Trade programs, can purchase offset credits up to a certain percentage of their total allotted emissions. This allows companies to output more pollution than initially permitted, however, they simultaneously fund projects to counteract this. While this contribution fails to adequately compensate for the irreparable damage dealt towards the environment from pollution, it does help to alleviate the negative long-term environmental impact caused by the release of greenhouse gases.

King County’s “Forest Carbon Program”

In this program, King County, a major district in Seattle, Washington, purchases “high-value forests that are at risk of development” and then offers buyers the opportunity to purchase carbon credits (Constantine). These credits represent the preservation of carbon in preserved forests and credit assistance towards maintaining a healthy planet.

Generated revenue from this project is later reinvested to protect additional forests, generating more credits for buyers to purchase. This project aims at creating an ecosystem of protected forests, increasing environmental stability, and facilitating further developments to assist with a reduction in carbon emissions.



What are the Benefits?

Since the release of harmful pollutants into the atmosphere cannot be immediately prevented, Carbon Offsets provide companies and people with the opportunity to invest in a greener future, creating systems for an environmentally sustainable planet.

Additional examples of Carbon Offset projects

- Reforestation/Forest Preservation
- Renewable Energy: Wind, Solar, and Hydro Power Implementation
- Improving Energy Efficiency: Technology innovation, Zero-waste energy projects

Criticisms of Carbon Offsets

While Carbon Offsets are a method of amending the damages induced by greenhouse gas emissions, they fail to address the difficulties faced by communities near heavily-polluting companies. At the “Our Power Convening”, an event held by the Climate Justice Alliance in California, Mari Rose Taruc, a member of the Asian

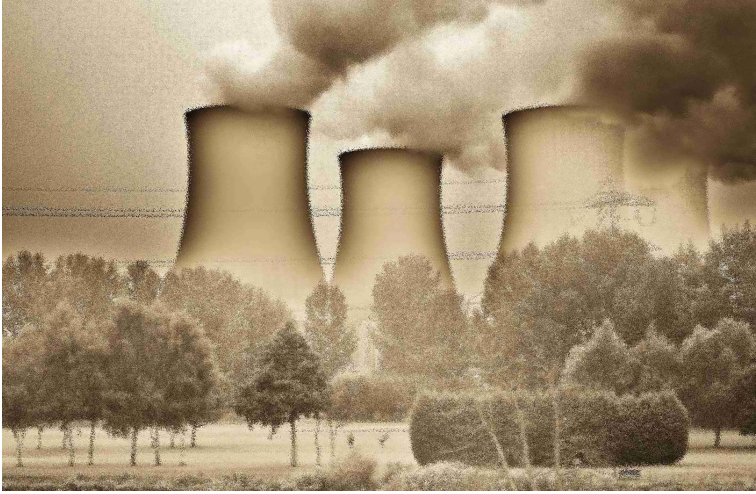
Pacific Environmental Network explains “how carbon offsets generated millions of dollars, without benefiting communities sacrificed to live near polluting industries. Corporations were able to buy carbon offsets, and just continue emitting toxic pollution into the air and water” (South Seattle Emerald).

Because companies require some incentive to invest in carbon offset programs, oftentimes, because of their contribution, they can release more pollutants into the surrounding area, hurting local communities nonetheless. While investments in Carbon Offsets do create opportunities to combat the adverse effects of climate change, using them as a means of bypassing restrictions set on pollution output is not a fair method of confronting the pertinent issue.

To Think On

Both Cap and Trade and Carbon Offsets are **viable solutions (link to False Solutions Vs. Real Solutions)** towards addressing climate change, however, criticism largely establishes the necessity of finding answers that prevent the creation of harmful pollutants in the first place. While these solutions appear to be helpful, either by reducing harmful emissions or laying the groundwork for a sustainable future, harmful emissions continue to be produced, hurting communities and raising health risks for innocent people.

The best possible solution, as cited by various climate activists and Seattle environmental groups, is to take preventative measures in the fight against climate change. Only when the release of carbon emissions and other dangerous pollutants falters will the climate community remark upon such genuine progress towards a better tomorrow.



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6. Dollars and Sense

The Rationale Behind Subsidies for the Energy Industry

MICHAEL ALBRECHT

Oil and water may not mix, but oil and money do. Subsidies for the fossil fuel industry have a long and documented history. Dating back to the Industrial Revolution, subsidies have helped grow America's economy by allowing companies to use money for business expenses and research instead of paying taxes¹. Governments have found subsidies necessary in a variety of industries for a variety of reasons. Sometimes the purpose is to protect and expand sectors, such as France's use of subsidies for their film industry². Other times subsidies are granted to drive innovation, such as in research and development (R&D) grants for the energy industry³. Subsidies can even be used for negotiating with a company, such as when municipalities tried to influence where Amazon built their second headquarters⁴. Because of the substantial benefits that subsidies bring with them, the government only uses these grants for businesses that they feel need it. However, the word "need" has shown itself to have much discretion in use.

1. Britannica - <https://www.britannica.com/topic/subsidy>
2. Springer Link - https://link.springer.com/chapter/10.1007%2F978-3-319-71716-6_18
3. Science Direct - <https://www.sciencedirect.com/science/article/pii/S2352484719301660>
4. Reuters - <https://www.reuters.com/article/us-amazon-com-headquarters-idUSKBN1CO1IP>

In 2016, nearly \$15 billion in federal government subsidies and support were granted to both non-renewable energy sectors, such as coal, and renewable energy sectors, such as solar⁵. To put this number in perspective, the entire US's energy production cost was \$85 billion in 2016⁶. This means that the average subsidy across sectors covered 18% of the production cost. However, not all industries are granted the same benefits. Government subsidies are given to energy sectors based on various factors, such as how environmentally friendly it is.

Primarily due to environmental concerns, the coal industry has seen a 2.9% decline in energy generated year-on-year from 2000 to 2016⁷. This is a lot of change, especially considering that the coal industry used to produce the most power in the US (51.4% in 2000)⁸. In 2016, that figure dipped below 30%.⁹ This decline in energy

5. White House - <https://www.whitehouse.gov/omb/analytical-perspectives/>
6. U.S. Energy Information Administration - <https://www.eia.gov/totalenergy/data/monthly/previous.php>
7. U.S. Energy Information Administration - <https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf>
8. U.S. Energy Information Administration - <https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf>
9. U.S. Energy Information Administration - <https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf>

produced is partially due to the decrease in subsidies granted to the coal industry. While coal is being used less, some renewable resources are exploding in popularity. Solar, which did not even exist in a considerable amount in 2000, has seen an average of 31.8% year-on-year growth through 2016. Similarly, wind, which used to make up a fraction of a percent of the US's energy, has increased over 26.3% each year through 2016. As the promise for a green and sustainable future continues to manifest itself, subsidies follow in large quantities. In fact, in 2016, 45% of federal grants supported the development of renewable energy suppliers. These energy companies include those heavily invested in biofuels, wind, and solar, among others. An additional 42% of federal subsidies are benefiting efforts to reduce energy consumption through higher efficiency. These "energy end-use" contributions can be seen in programs such as the US Department of Health and Human Services' Low Income Energy Assistance Program. Out of all of the industries, the biofuels industry has been a favorite for attracting subsidies, as it is the only renewable technology to receive an incremental increase in subsidy support from 2013 to 2016. Despite all of these subsidies and growth, renewable energies only made up 15.2% of the energy market in 2016. However, this is bound to change. Renewables are outpacing non-renewables growth 7:1. The renewable energies sector is slowly taking a larger share of the energy market (9.7 in 2000, 15.2 in 2016). Even with all of this growth, it is unclear whether these industries will receive more subsidies years from now. This uncertainty is because subsidies are becoming less common. In 2016, \$15 billion in energy subsidies were granted: a roughly 60% decline from 2010's \$38 billion. This is primarily due to the expiration of temporary measures, such as programs included in the American Recovery and Reinvestment Act of 2009. However, other factors are contributing to the decrease in energy subsidies. Nearly 60% of all of the subsidies granted have been through the use of 36 large-scope, energy-specific tax code provisions, according to 2016 data. These financial interventions have been shown to support energy corporations more than any

other type of subsidy. But as politicians vow to make the US's tax code less convoluted, these provisions may disappear. Furthermore, beyond the traditional subsidies such as tax expenditures, direct expenditures, and R&D support, the Department of Energy has guaranteed loans to companies promising innovative clean energy technologies. These are considered subsidies since these loans are high risk and cannot obtain private financing. However, no new loans were issued between 2013 and 2016. This is partially due to the controversial funding of non-renewable energy facilities, such as the Vogtle Nuclear Power Plant in Georgia. With temporary initiatives expiring, the streamlining of tax law, and the end of guaranteed government loans, subsidies may soon cease to be a popular policy proposal. Instead, policymakers may opt to lower the corporate tax rate or do nothing at all.

Only one thing can be made exceptionally clear while deciphering all of these statistics: many details are not clear. The complexity of federal financial activities is mind-boggling, as government files contain a wide variety of donors and recipients over many years. Therefore, all information outlined must be taken in the context that it is presented. Extrapolating these data is not permissible.

As dull as energy subsidies may seem, they have stirred up quite a bit of controversy. During a time of growing fear over climate change, many people question whether granting tax credits and other benefits to private corporations is acceptable in terms of economic and environmental policy, especially for non-renewable energy companies. As the conversation morphs around which energy projects are should be built, debates over the government's role in funding these projects convene. We'll examine a few of the debates surrounding a significant energy project in the Pacific Northwest.

Tacoma is well renowned for its "aroma." The smelly sulfur, largely

believed to be from the Simpson Tacoma Kraft pulp and paper mill, has even forced Bruce Springsteen to leave the town early after a concert. In an attempt to reduce air pollution and provide the Pacific Northwest with reliable energy, Puget Sound Energy (PSE) and the Port of Tacoma have decided to open a liquefied natural gas (LNG) facility. At the center of the project is an 8-million-gallon silo, just twelve feet shorter than the Tacoma dome. The chilled tank, surrounded by three feet of concrete, is essentially a silo for energy. Just as large as the container is the controversy surrounding it. Many environmental advocacy groups, such as 350 Seattle, have allocated much of their time and money to prevent the massive LNG project from being completed. They claim that this project will create a fossil fuel dependence spanning decades and thus threaten residents' health and safety for years to come. Furthermore, non-environmental groups have also taken a keen interest in preventing further development of the facility. Most noticeably, the Puyallup Tribe of Indians took legal action against the Puget Sound Clean Air Agency for issuing a permit to PSE in 2019. Even less conventional methods are being attempted to maintain pressure on those in power. The Puyallup Water Warriors and Redefine Tacoma organizations have created an informal petition on the popular petition platform, Change.org. Sixty-nine thousand signatures have been collected to tell prominent Washington State politicians to halt further development of the project. Through public engagement, legal action, and less conventional means, the #NOLNG movement has garnered the support of over 80 environmental and social justice organizations as well as tens of thousands of individuals. More information about the #NOLNG movement can be found [in this article](#). All of these organizations would like the facility to cease to exist, but some are trying to prevent it from an economic standpoint rather than an environmental, safety, or legal one. Some of these organizations see an issue with the way the Tacoma LNG plant is being funded, and it is not hard to see why.

\$310 million is not just big bucks; it's Google-sized bucks. Google

was recently ordered to pay \$310 million in a settlement regarding sexual harassment in their offices¹⁰. Similarly, taxpayers have been ordered to pay a substantial part of the \$310 million required to build the Tacoma LNG facility. Here's the story. In 2016, plans were announced to build the LNG facility. During talks with Washington State's Utilities and Transportation Commission, it was decided on how PSE, an investor-owned, private energy company, would structure its corporate group. Talks about how much cost the company would bear in building and maintaining the facility were also discussed. It was decided that the Port of Tacoma will own the plant, and PSE would lease the land for their energy operations. Selling some of the LNG to the local community allows PSE to classify the facility as "peak-shaving," which in turn allows PSE to pass some construction costs onto the ratepayers. At the time, PSE spokesman Grant Ringel claimed that utility ratepayers would only be responsible for paying for the portion of the facility that they use. Therefore, PSE would be accountable for 57% of the construction costs, and the remaining 43% of the facility would be paid for by PSE's 1.5 million customers. Ringel claimed that when demand spikes during the coldest days of the year, the utility ratepayer are expected to use more than half of the facility's reserve. However, this is not true during most days of the year. According to some figures, PSE ratepayers will only use 7% of the facility's LNG for the first ten years of operation. After these ten years have passed, the facility will provide no benefit to PSE customers. At this point, all of the energy stored at the facility will be used for maritime fuel, and all profits from these sales will solely benefit PSE. And because PSE is a for-profit entity, the plant's profits will go to the project's investors, notably PSE's subsidiary, Puget LNG LLC, and

10. CNBC - <https://www.cnbc.com/2020/09/29/googles-310-million-sexual-misconduct-settlement-details.html>

the Australia-based investment bank, Macquarie Group Ltd. To summarize, over the facility's 40-year life span, ratepayers will use less than 2% of the LNG stored.

It is easier to understand all of these values when dealing with cash values. Given that PSE's ratepayers will be charged 43% of the \$310 million price tag, the ratepayers will have to pay \$134 million in construction costs. That works out to \$89.63 per PSE customer. However, those living in Tacoma bear an additional cost. A brand-new fire station is being built, new roads are being poured, and safety precautions are taking effect. All of this will cost the City of Tacoma \$13.5 million. This bill gets passed on to the taxpayers of Tacoma in the amount of \$80.97 per citizen. By combining the cost of the LNG facility and the cost of the facilities around the LNG facility, it can be concluded that each resident of Tacoma is responsible for \$170.60. But wait, there's more! Tacoma taxpayers face an additional \$12 per year to upkeep the new fire station at the Port of Tacoma. These statistics don't even include the additional millions of dollars promised to PSE in tax subsidies. The Washington State legislature approved PSE for an \$8 million tax break every biennial funding cycle and waved a sales tax on construction cost. These statistics are upsetting to many citizens of Tacoma. John Carlton, a Tacoma resident, founded the group RedLine Tacoma to lobby against these charges. "This is a private venture. It doesn't make sense that our rates should be attached to this venture's investment risks", he said in a 2016 interview. Granting subsidies to PSE has not only raised questions as to what role the government has in funding such projects but has added more fuel to the debate among environmental activists. Groups such as Advocates for a Cleaner Tacoma, Citizens for a Healthy Bay, and 350 Tacoma have listed their main arguments as to why the Tacoma LNG facility should not be built. Among the top points—the negative financial impact on the local community. These issues would only be exasperated if a catastrophe were to ensue. Taxpayers would likely have to bear nearly all of the costs associated with a disaster,

financial and otherwise. This is due to PSE's Limited Liability Corporation, which could declare bankruptcy if damages due to their facility exceeded \$50 million, the amount covered on their insurance policy. To make a comparison, the relatively small Williams Plymouth LNG explosion in Eastern Washington in 2014 cost \$69 million, not including lawsuits filed on behalf of individuals. Therefore, if a significant accident was to occur, tens of millions of dollars could be placed on the shoulders of those most impacted by the disaster.

While the Tacoma LNG facility is a great case study when analyzing the impact of subsidies on the energy industry, it is far from the only government project receiving financial assistance, and thus, criticism. In 2017, TransAlta received tax exemptions from the Washington State legislative branch to replace the 50-year-old coal plant in Centralia, Washington, with a new natural gas plant. Governor Jay Inslee later vetoed this decision. Some may see this as a win for the environment, as natural gas is prevented from being sold. Some may see this as causing harm to the environment, as coal, a dirtier alternative to natural gas, is still being used. While many focus on the politics regarding which fuels should be used, many overlook another vital question: who will finance the production of the fuels? As a citizen of the State of Washington, understand that all facets of local, state, and the federal government have an impact on you, albeit some larger than others. There is a motive behind the sales tax, property tax, estate tax, and so on. Every dollar spent has a place to be, and when we can track where these dollars go, we can have a greater understanding of the government's role in all of our lives.

PART III

HOUSING AND CLIMATE JUSTICE

Leilani Batac



(Click on media to be taken to its source)

While it is important to notice that climate change is directly associated with many issues we are faced with today—such as health impacts, reduced agricultural yields, and declining water supply (USGCRP)—it is also essential to understand that climate change is indirectly related to other threats as well. When talking about climate change in Seattle, there are numerous contributing factors. In this section, we will be highlighting those factors while focusing on linking affordable housing and climate change. Establishing the basis of this topic, affordable housing is associated with climate justice, both emphasizing the need to keep communities stable and together along with being a lead solution to a reduction of

greenhouse gas emissions produced by the transportation within and out of the city.

In 2016, Got Green and Puget Sound Sage conducted a study titled “Our People, Our Planet, Our Power.” which focused on the South of Seattle. Within their studies on climate change, they conveyed the community’s opinions, feelings, and beliefs and found that the main concern the community articulated was the availability

of affordable housing. The groups linked this to climate resilience by explaining that displacement leads to “not just displacement of households, but erosion of cultural anchors like community centers, culturally relevant businesses, faith institutions, and service providers. When communities lose these anchors or have to leave them behind as they disperse to the suburbs, we lose critical social cohesion to deal with all threats, including climate change.” They had found that their community and their social location was the center of their well-being and a haven from climate change.

Considering the lack of affordable housing and being stripped away from their haven from climate change, it is important to recognize who makes up the communities who are faced with these detrimental states—people of color, those who have been marginalized, and low-income people. Research shows that frontline low-income and communities of color are first and worst hit by climate change and its impacts. In Washington, 46 percent of all toxic sites are in areas mostly populated by people of color, while 56 percent are in largely low-income areas. These communities experience the harms of pollution and climate change, including extreme weather events, contaminated drinking water and waterways, poor air quality, and unhealthy housing (Seattle Foundation 2020). [Read more about the Disproportionate Impacts](#)

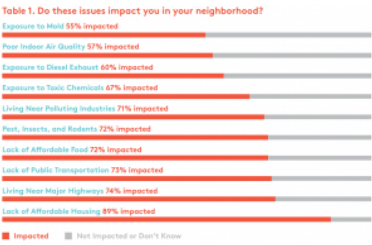


Table from Our People, Our Planet, Our Power created by Got Green and Puget Sound Sage. (Click on media to be taken to its source)

[of Climate Change](#). With that, housing and its placement are clearly connected to our health, but it's not so obvious that housing placement can be indirectly related to climate change in these communities.



Source of Seattle's Climate Emissions in 2016 from the City of Seattle. **(Click on media to be taken to its source)**

As a result of lacking affordable housing stated previously, there comes an additional consequence paired with it. The issue with affordable housing is directly related to accessibility to transportation, which then makes it indirectly associated with climate change. Road transportation is the leading cause of greenhouse gas emissions here in Seattle. In 2016, nearly two-thirds of Seattle's climate pollution came from road transportation, 53% due to passenger

transportation, and 9% from freight transportation (City of Seattle). Which the city's set goal of reducing emissions from passenger vehicle transportation to 82% of 2008 levels by 2030 stems from. One action to reduce emissions is to implement transportation solutions, for example, transit-oriented development (TOD), one of the older innovative transportation solutions, is very likely to reduce emissions and help build resilience (U.S. Global Change Research Program). However, as it has been stated in "Our People, Our Planet, Our Power," these reductions are only possible with effective land use and transportation design, coupled with affordable housing.

Prioritizing adaptation actions—for example, increasing the amount of affordable housing and accessibility to clean transportation—for the most vulnerable populations would contribute to a more equitable and healthier future within and across communities. In this



(Click on media to be taken to its source)

prioritizing process in Seattle, it is essential that affordable housing becomes granted to those who lack it. However, it is more important to place these affordable housings in neighborhoods that are close in proximity to transit. It has been documented that higher-income households drive more and own more vehicles when compared to low-income households, which makes it critical that low-income families can afford housing in areas that provide them access to transit. On top of that, low-income households near transit drive 50% less than low-income households in non-TOD communities, which decreases greenhouse gas emissions (TransForm).

With all this in mind, affordable housing is essential when it comes to fighting for climate justice, especially for the low-income communities and the communities of color. The lack of affordable housing strips apart communities, which leads to a lack of clean public transportation, which is a major contributor to climate change here in Seattle. In the following subsections, the relation between affordable housing and climate justice will be expanded through:

- [Green Architecture & LEED Certification](#)
- [False Solutions Vs. Real Solutions](#)
- [Housing Organization, Land Trust, Tax Proposal, and the Hanford Nuclear Site](#)

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- Transit-oriented development near the Othello Station in Southeast Seattle. Photo by SounderBruce/Wikipedia Commons

7. Green Architecture & LEED Certification

SOFIA CHRISTOPHEL-LICHTI AND WARREN LLOYD

I. Introduction

“Sustainable development is the most vibrant and powerful force to impact the building design and construction field in more than a decade” ([Cassidy 1](#)). The market demand for green buildings is doubling every three years, and the advancement of energy-efficient technology is booming. There is immense value in promoting environmentally responsible design and construction to mitigate the costs of climate change. But how are these changes implemented, and why are they important?

II. Types of Green Technologies

Fundamentally, there are “net-zero” buildings which produce equal power to that they consume, and if they produce a surplus, they are called “energy-plus” buildings. Reaching these goals takes intentionality through every step of the construction process, and there are many emerging technologies that work towards the goal of net-zero (or plus) energy efficiency. HVAC systems are efficient heating and cooling systems, that when paired with green roofs and green insulation can really reduce energy use and greenhouse gas emissions. Green roofs or a rooftop garden is a space or lawn of vegetation that can reduce temperatures indoors and air quality outdoors ([Tobias](#)). Insulation in general holds in heat, but the green aspect comes in when the builder eliminates the need for high-end finishes made from non-renewable materials (i.e. denim insulation, cellulose insulation, and cotton insulations). Instead, products that can be used include sheep’s wool, Icynene spray foam, and ThermaCork ([Miller](#)). Solar power also has a huge effect on energy production and consumption in buildings, and it can be done in two

ways. Most commonly, active solar power is used when functional panels provide heating and electricity. They have a high-cost installation process but lower electricity and heat bills in the future. On the flip side, passive solar power uses the sun's rays to warm the house through strategic window placement and heat-absorbing surfaces which reduces the need for a heating system in the winter. Lastly, water conservation is of key importance to green architecture. This includes installing efficient fixtures, reusing greywater, recycling of treated water, and ensuring potable water be used for only that.

III. Advantages & Disadvantages

There are many advantages to promoting energy-efficient and green architecture. The technologies involved in the process reduce pollution, decrease use of natural resources and fuels, increase water efficiency, and improve air quality. To environmentalists, these buildings are a dream ([Benefits of green building](#)). To consumers, there are tax benefits to living in these buildings as there is a higher property value, and on average, they are 14% less expensive to operate. It would be smart for builders to appeal to ever growing climate conscious consumers and promote more of these construction practices. According to the World Green Building Trends SmartMarket Report "A notably high level of green growth is expected in the US, but the data suggest that more measurement of green benefits... would help strengthen the business case for green" ([Dodge Data & Analytics](#)). Basically the benefits need to be further studies for business to trust the long term success in investing in green infrastructure.

Now, there are downsides. The building process is a difficult and expensive task. Since these are newer concepts and systems, the mechanics and automation needed to install it are also new and pricey. In addition, green architects prefer working with wood rather than steel and concrete, which is an environmentally sound decision. But what isn't fully taken into account is the deforestation effects. Not all builders will plant equal amounts of trees as they

tear down for construction, so it could have catastrophic results on forests and air quality. Furthermore, new buildings with eco-friendly amenities tend to be costly to live in. It needs to be an intentional part of the process of construction to not push out folks in the name of environmental progress. Gentrification is a real issue that could very well be affected by the changing demographics of the construction industry.

IV. LEED Certification

In the early 1990s, the world was waking up to the reality of climate change brought about by humans. At an AIA meeting in 1993, David Gottfried, Rick Fedrizzi, and Mike Italiano brought up their proposal for a standardized building efficiency rating system, forming the U.S. Green Building Council. LEED 1.0 was developed and released as a pilot program in 1998. LEED is best described as “a leading-edge system for designing, constructing, and certifying the world’s greenest and best buildings” (Cassidy 8). LEED functions effectively because it is a relatively simple rating system. Buildings have 5 categories that must be met and receive assigned point values for meeting requirements in those categories. After points are totaled, a building can be certified or receive higher certification levels of silver, gold, and platinum. Creating one standard rating system for all buildings makes expectations clearer and promotes clean and renewable structures.

V. Seattle Examples



A video element has been excluded from this version of the text. You can watch it online here:

<https://uw.pressbooks.pub/121climatejustice/?p=279>

VI. Why Does This Matter?

Given that the demand for eco-friendly architecture is growing at a high rate, it may become the new normal. Furthermore, as industries continue on the current trajectory of valuing sustainability, they could aid in saving the planet as long as done in such a way as to not generate new problems. An important aspect in making sure self-supporting properties are completed in the right way is keeping in mind affordability. Rising costs could result in displacement of residents and changes to the local economies. Generally speaking, all aspects of the climate justice movement are interconnected and interdependent. Therefore, it is important to recognize the fragile nature of problem-solving intentionally in order to achieve some semblance of true climate justice.

For more more on these topics visit [the next chapter](#) on real solutions vs. false solutions and “[Climate Justice & Affordable Housing](#).”

8. False Solutions Vs. Real Solutions

YIXIN ZHANG

- **I. Introduction**

As global warming worsens, tons of possible solutions have been proposed to cool down our planet and building a greener and more sustainable ecosphere, but not all of them are real solutions.



On Fire Markus Spiske

Real solutions should be those contribute to the problem from the origin like reducing carbon emissions, increasing energy efficiency and using more alternative energy while maintaining economic growth, social justice and rising standard of life. However, organizations have proposed multiple solutions that do not address the root causes of climate change but have the potential to worsen the crisis, which can be defined as false solutions ([Wildfire](#)). And one of the most relatable of them all is displacement.

- **II. Displacement**

But why displacement? For one, the issue of displacement/gentrification is easily diminished by other long-standing social justices, and when it comes to city-planning, it is not unusual to witness that government, consultants, and private developers are often in predominant roles of such project. A planning process or development project designed and driven solely by the community members who live there is actually rarity. With the goal of dealing

with climate change, it is vital for us to face our visceral fear of shattering wrongful approach towards the issue. In this case, displacement project led by interests-seekers is the wrongful approach. For another, one critical step in resolving climate crisis is to abridge the climate gap ([Link to Disproportionate Impact of Climate Change](#)), the disproportionate and unequal impact that climate crisis wreaked to people of color living in more polluted areas and the poor, and evidently, displacement is increasing that gap within local communities, here, in the city of Seattle. According to a survey conducted by **Got Green and Puget Sound Sage** (two environment justice organizations based in Seattle dedicated themselves to ensuring equitable benefits of green economy), one third of the survey respondents identified the lack of affordable housing as the most concerned issue impacting their neighborhood ([Link to Affordable Housing and Transportation](#)). Thus, it is palpable to extrapolate that displacement is simply not the panacea for for addressing the climate gap and reducing the emission of greenhouse gases instead this measurement exacerbates those obstinate problems. Ideally, the houses in the city are being refurbished by developers to create our ideal green communities to lower the greenhouse gas emissions. Notwithstanding, refurbishment leads to the spike of housing prices and forces community members who cannot affordable these “green communities” to leave the places they called home since their childhood. To make things worse, the neighborhoods they were displaced are nowhere near convenient public transportation. Consequently, the lack of accessible public transit again forces them to drive the older and polluting vehicles they own to commute. And driving from these households significantly impacts greenhouse gas emissions reduction ([Got Green Puget Sound Sage](#)).

- **III. Pros VS Cons**

Here is a brief summary of some of the most noticeable benefits and drawbacks of displacement:

- Pros:
 - Mitigating the blight and population loss suffered by urban core
 - Revamping city neighborhoods
 - Overhauling city infrastructure and amenities
- Cons:
 - Rise in property values and rents
 - Original residents, poorer and often people of color, are being pushed out of the neighborhoods
 - Increase in greenhouse gas emissions
 - Enlarging the climate gap
 - Undermining racial justices
- **IV. Remedies to displacement**

Fighting for the new upcoming displacement and affordable housing crisis is part of a large effort to fight against climate change, therefore real solutions to help citizens live sustainably are required. Government could start building affordable housing in green community instead of leaving it mostly to private developers through tax credits and regulate rules and laws to prevent rising house prices by those building developers who want to make excessive profits from it ([Eligon](#)). At the same time, Climate change organizations could collect social funds to support those original residents who fall under certain income levels and are facing crisis of displacement and allocate this money to support those under-resourced area. Additionally, Social enterprises could start project to improve

infrastructures including public parks and transportation line in communities. Infrastructures have to be upgraded not only for the reduction of greenhouse gases emissions but also to abridge the climate gap. In the end, Individuals could participate more actively in specific affordable housing development through municipal bond elections distributed by local government and take actions on low-carbon life ([Sukumaran](#)).

- **V. Other False Solutions VS Real Solutions**



Together We Save Our Planet by Climate Justice Taranaki

a) Other false solutions:

1. Carbon offsets that cannot deliver permanent emissions reductions and could be used to condone emissions elsewhere.
2. Cap and trade that devised by corporates and empowered these corporations to pollute somewhere else in order to

maximize short-term profits. ([Link to Cap and Trade and Carbon Offsets](#))

3. Cloud seeding that controlled by the government.
4. Genetically modified, climate-resistant crop seeds that only produce for one generation.
5. Replacing all of our internal combustion engine(ICE) cars by their electric counterparts.([Wildfire](#))
6. Solar radiation management and that shows no effect on the reduction of greenhouse gas levels but has significant impact on the solar panels' efficiency and photosynthesis. ([Wildfire](#))

b) Real solutions:

1. Worker owned cooperatives that were built for solidarity economy.
2. Collective housing that is permanently affordable and effectively stops gentrification. ([Link to Affordable Housing and Transportation](#))
3. Sustainable farms that actually make self-sufficiency for urban growers possible.
4. Green architecture. ([Link to Green Architecture and LEED Certification](#))
5. Constructing livelihoods close to where people live, close enough to walk, bike, or take public transportation.
6. Gradually phasing out the burning of fossil fuels and replacing them with solar panels, windmills, and hydro turbines

• VI. Peroration

Envisage a future where one day both the existing community and new members could all benefit from the vision designed by grassroots from all across the neighborhoods, by people who care. Unfortunately, for too many people for too long, we have failed to

live up to this ideal. In light of the grim status quo, our planet is teetering on the brink of the abyss of the sixth mass extinction, the onus is on us to not only shed lights on the false solutions to meliorate our fragile ecosphere, but more importantly, view the world with our limpid eyes and our conscience to seek for the real solutions that come with profound transformations.

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PART IV

PUGET SOUND ECOLOGY

9. Water-Cycle

JASON WANG

Before we start our topic how the climate change impacts the water cycle of Puget Sound, let me explain the entire process of the water cycle . The heat from the sun turn the water in the ocean, river, and lake into the invisible gas, called water vapor. This process is called evaporation. After the evaporation, water vapor get high in the sky, and the temperature around them will be cooler, cause the higher the elevation be, the colder the temperature will be. The cold temperature changes the water vapor into cloud, which is formed by the gaseous and liquid water, and then drop rain or snow back to earth, and forms underground water, which will become the main resource of the river and lake. That the whole process of the water cycle.

Back to our topic, what the climate change impacts the water of Puget Sound. The first thing we need to know is what climate change happened. Recent years, the rate of plant coverage becomes lower than it used to be. There are a lot of reasons cause the rate of plant coverage becomes lower, for example the deforest deforestation, large-scale agricultural projects, change of the temperature, pollution made by human, and so on. But the most important and primary reason is the development of the city. Especially over the last half century, expansion of the major metropolitan areas, such as the Everett-Seattle-Tacoma corridor of western Washington, has resulted in conversion of substantial portions of the landscape from forest to urban and suburban uses. (Cou) City development turns the forest into commercial zone, living area, highway and so on. For example, there are more skyscrapers in Seattle and the total building area has increased a lot than one century ago. The main problem is people use water-proof material to help develop their cities, like the using of pitch to build road. That causes rain from the sky can't get into the underground.

In other word, the main resource of the river and lake may not exist anymore.

But where will those water be, instead of forming river and lake? Following model testing, the overall effects of urbanization were investigated, showing that urbanization increased both seasonal and annual stream-flows substantially (Julie). The example here shows those water will skip the process of water cycle and get into the river and lake directly, which lead to the overall stream-flows increased. Sometimes the increased stream-flows may not be a good thing, although it seems like there are more water in the river and lake so that people have more water resource to use instead of being arid and barren. Increased steam-flows may be a challenge for the water cycle system, cause the total steam-flows for a water cycle system can controled is constant. If more water is in this system, it may happen flood and soil erosion, which will caused tons of loss for agriculture and economy, even the life of human.

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“Effects of a century of land cover and climate change on the hydrology of the Puget Sound basin”

[http://www.prism.washington.edu/story/
Water+Cycle+of+Puget+Sound](http://www.prism.washington.edu/story/Water+Cycle+of+Puget+Sound)

Julie A. Vano¹ , Nathalie Voisin¹ , Lan Cuo^{1,2}, Alan F. Hamlet^{1,2}, Marketa McGuire Elsner² , Richard N. Palmer³ , Austin Polebitski¹ , and Dennis P. Lettenmaier^{1,2}

“Climate Change Impacts on Water Management in the Puget Sound Region, Washington, USA”

[https://digital.lib.washington.edu/researchworks/bitstream/
handle/1773/34594/4.pdf?sequence=1](https://digital.lib.washington.edu/researchworks/bitstream/handle/1773/34594/4.pdf?sequence=1)

10. Orcas in Puget Sound

TYLER WU

Introduction

In 2018, a total of over 300,000 ferry travelled the Salish Sea, while 6,330 cargo, container and passenger vessels, plus 1,124 oil tankers and barge tows entered Washington waters, much of the traffic heading towards the Port of Vancouver on the West Coast (Mapes, 2019a). The ships produce a type of sound for communication purposes in every season, day and night, while such sounds are noises in the same sonic sweet spot orcas for killer whales to hunt and communicate. As a result, the killer whales are troubled by the noise pollutions to hunt the scarce food, salmon, and thus are headed towards extinction (Mapes, 2019a).

In this context, it is critical to evaluate what interventions humans can take to mitigate the negative impacts of sound noise to killer whale? To explore answers to this research question, secondary data can be collected from various website sources such as BBC News, the Seattle Times, academic journal articles. This report will include three chapters. One is the introduction of general audience. The second section is about the link of this idea with the climate justice movement. The third section is about killer whale's adaptation to deal with the issue of noise pollution.

Introduction of a general audience

The general public are the target audience of this topic. On the one hand, local people must be aware of the extinctive status of killer whale so that they can make efforts and make behavioral changes to alter the situation. On the other hand, people living outside the Northwest USA should learn from this lesson and take measures to protect animals in local waters or forests. In all, people on the planet can take lessons from this report about the importance of conserving wild animals and helping them adapt to the changing environment.

Only 73 killer whale survives now (Mapes, 2019b). Figure 1 illustrates the sharp decline of number of killer whales, declining from the peak point of 98 in 1996 to 72 in 2020.

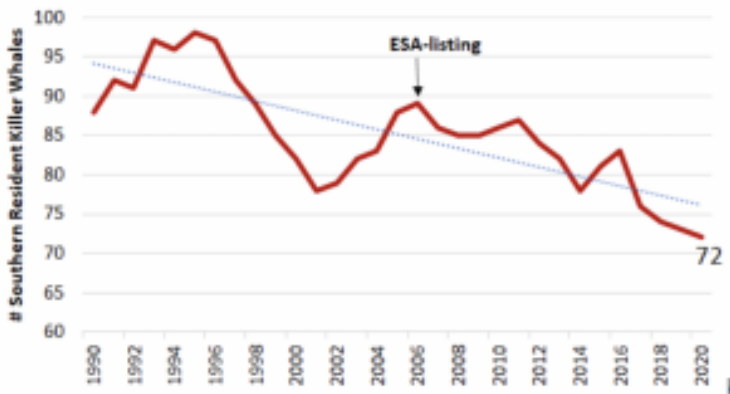


Figure 1. number of killer whales

Source: USA Oceana (2020)

The report of Mapes (2019a) highlights vessel noises as the primary reason to explain the decline of number of killer whales. In addition to vessel noise, there are other reason related to climate change, such as declining food resources (e.g. salmon) for killer whales and contaminants (e.g. CBs, DDT and other pesticides) (PTMSC, 2019; Mapes, 2019b). Specifically, it is explained that the habitats are impacted by intense effects of climate changes, which impacted the number of salmon (Mapes, 2019b). Therefore, climate change that has intense effects on different species' habitats in the eco-system will post great threats to different species, ranging from salmon to killer whales. In this vein, killer whales' food sources and inhabits are impacted by climate change. In other words, the survival of killer whale is both directly and indirectly affected by climate change.

Climate Justice movements

Since 2005, southern resident killer whales have been included in the list of federal protection. This endangered species list also includes the salmon. Consequently, any federal activities that are likely to impact the listed species are required to go through consultation with NOAA. (Mapes, 2019b). However, it is concerned

that simply listing salmon and killer whale into the endangered animal list is not enough. More measures should be taken to protect the coastal habitat which is paramount to survival of species like killer whale.

In addition to legislative change, a research program was started by Northwest Fisheries Science Center in 2003 to fill data gaps and investigate how different potential threats impact the population of killer whale. Based on better understanding about killer whale and its living environment, local organization and authority can help inform conservation and recovery efforts at the state, national and international levels (NOAA Fisheries, 2020). Henceforth, ecosystem research is a complementary part of protective measures to prevent the extinction of killer whales. In addition, the research programs require financial supports from either profitable or non-profitable organizations, such as Lindblad Expeditions-National Geographic (LEX-NG) Fund (Gable, 2017). They learned that not only government and local authoritative institution should engage in protection of killer whale, but also other relevant institutions, organizations and even individual citizens should be appealed to engage in the protection of killer whale.

Animals' adaptation to the issues

While some plants and animal species are competent to adjust to new habitats and quickly occupy different landscape parts, however the rare and endangered species are likely to be less abundant and even end in extinction (US Fish & Wildlife Service, 2020). Compared with sea anemone, killer whale has much slower speed to adapt to environmental changes and thus much weaker capability to keep up with rapid shifts in suitable climates and habitats (US Fish & Wildlife Service, 2020). When the killer whales are slow to adapt to environmental changes, their population will be threatened. This assumption is backed by the fact that only 73 killer whales survive. The population of killer whales has declined sharply in the past years because of climate change and changing inhabits. What is more, as revealed by a research of killer whale, according to different food supply, different types of killer whale have different

ways to adapt to climate changes (Gable, 2017). This research finding is important for humans to intervene with different types of measures to help killer whale to adapt to the changing climate.

Conclusion

In conclusion, climate change and other human activities such as vessel noises threaten the survival of killer whale in the Northwest USA. It is important to research this topic because the survival of killer whale is related to the diversity of species on the planet and thus related to the world's sustainable development. Given killer whale has much weaker capability to adapt to changing environment, appropriate human interventions should be considered. It is important for different parties to get involved to help killer whales adapt to the changing inhabsits.

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- number of killer whales

II. Climate Change and its Impacts on Salmon and Wildlife

ESHA GOLLAPALLI



The Puget Sound's delicate ecosystem uses checks and balances to maintain its diversity and natural resources. However, as global patterns change, the ability for the Puget Sound's ecosystem to adapt, weakens.

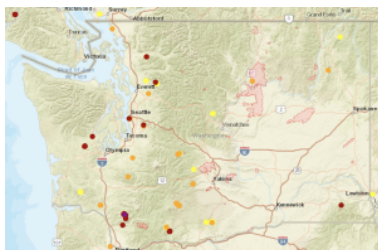
Wildfires and Air Pollution

With an increase of [wildfires and smoke pollution](#) all over Washington state, we must remember only some animals have the ability to escape. This year's (2020) wildfires are believed to "have killed 50% of the state's endangered pygmy rabbits, which inhabit sagebrush flats that burned this year" (Pennisi). This year's unusual abundance of wildfires, led to the death of many species who were not adapted to the sudden environmental changes. The wildfires

not only impacted land animals, but salmon and other marine species were also negatively impacted by wild

fires through increased water acidification which is detrimental to the marine ecosystem as the “recovery of [orca](#), salmon, and other marine life is dependent on a healthy Puget Sound” (Norris). Studies indicate that the fires, even if not initially caused by global warming, climate change and greenhouse gases are a large promotor for wildfires (Soloman). Thus, proving once again that increasing global temperatures from human activities are proportional to the increase of wildfires leading to the demise of various species, all within Washington State.

[Interactive map of current wildfires in the US West Coast"](#)
data-url="http://maps.nwcg.gov/sa/#/%3F/%3F/47.1312/-119.8254/7">Interactive map of current wildfires in the US West Coast">



[Interactive map of current wildfires in the US West Coast](#)

Rapidly Changing Temperatures and Climate



“Keen’s Myotis Bat” by Tim Gage

Within the Puget Sound itself, animals are being forced to adapt to the rapidly changing temperatures, leading to declines of long-lived species. For instance, as the water temperature rises “the amount of time a spawning adult [Chinook Salmon] can persist in freshwater [decreases, which] decreases the total distance a fish can

migrate on a given level of energy stores” (Tillman P). Not only is the salmon’s reproduction rate dramatically altered and forced to migrate elsewhere, but they are struggling to migrate altogether. Another species, “Keen’s Myotis” are unable to migrate at all making it very susceptible to temperature changes “that drive the timing

and length of winter hibernation [resulting] in a mismatch in timing of insect prey availability and emergence from hibernation” (Tillman P). Species such as the “Keen’s Myotis” remind us that global warming does not only lead to warmer summers, but colder



Chinook Salmon

winters as well. Therefore, allowing a much wider range of species to be impacted, to then impact its prey’s or predators’ populations as well, disrupting, not one species, but entire food webs.

Harbor Pollution Effects



Orca spotted in Puget Sound

Serving as a boat harbor, fishery, dumping ground, and recreational area, the Puget Sound inlet hosts a variety of pollutants that damage habitats and wildlife. A major pollutant in the sound is plastic. Rooting from litter or micro-plastics from other toxins, once in 2010

“a beached gray whale was found in West Seattle with 20 plastic bags in its stomach” (Washington). While plastic is so commonly used, we may disregard its incredible effects on the environment as it also is said to “never degrade” (Washington). Daily, boats and

vessels are using the sound for fishing, whale watching, or transportation, disregarding the amount of damage done to [whale populations](#) from boat pollution (oil spills, chemicals, and debris). These fishing industries are a large contributor to the Chinook Salmons numbers, ever since “1971” in which “remaining wild populations of Chinook salmon [last lived] with minimal hatchery interference” (Bressan). The impacts fishing and their vessels have on the whale and salmon population have remained steady with commercial fishing increasing, while fish populations decreased. The decrease in these populations have only led to need for more commercial markets, leading to a greater amount of pollution and deeper decline of these ecosystems.

A Call to Action

The Puget Sound’s wildlife has been noticeably affected from environmental damage from wildfires, overall global temperature trends, and direct inner region pollution. The animals are unable to adapt as quickly as the environment around this is changing, leading to declines or struggling populations that effect the entire biome around them. As people continue to use the Sounds natural resources and water supply, the need for climate change action only deepens.



Seattle Reflection

Media Attributions

- [Screen Shot 2020-12-04 at 5.44.30 PM](#)



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12. So... What Does Ecology Have to do With Seattle?

MIKAELA WILLIAMS

Climate Change on Hydropower

Seattle City Light provides power for about 1 million people in Seattle and the communities surrounding the city. They do this by being 90 percent reliant on hydroelectric power. Long-term climate change threatens this source of power with rising temperatures, the rising sea level, and more extreme projected precipitation levels ([Greenest](#)). The impacts of climate change include a drier summer and wetter spring, winter, and fall seasons. By the 2050s, we can expect to see, on average, a -22 percent decline in rainfall during the summer months in Seattle ([Mauger](#)). This poses a significant problem for a city heavily reliant on hydroelectricity.



Boundary Dam on Pend Oreille River

In actuality, the other, projected wetter, seasons have additional adverse effects on hydropower. Seattle City Light depends on the area's snowpacks to store water: these will be used maintain power throughout the drier summers. However, the combination of warmer temperatures, rising sea levels, and more rain will cause glaciers and snowpacks to melt faster ([Greenest](#)). This leaves the summer months without reserve power when the rainfall is already light during that time of the year. Without reliable and sustainable rainfall, hydroelectric dams rely on that naturally stored

water to provide power to one of the most established tech hubs in the country. Now, even the backup plan is literally melting away, creating a future with severe power shortages during the summer. Without the power generated by hydroelectric dams, Seattle will need to invest and explore other means of electricity. These expenditures will be costly and may not have the advantages of clean, renewable power. If we return to using fossil fuels, the emissions emitted when burned will make the effects of climate change worse, putting Seattle right back to where it started—without hydropower and clean energy.

For more information about energy systems in Seattle, visit: [Dollars and Sense: The Rationale Behind Subsidies for the Energy Industry](#)

How Seattle's Famous Rain Carries Pollution into Our Waters



Polluted Stormwater and Heron

Polluted rain runoff is one of the biggest toxic threats facing the Puget Sound ([Pollution](#)). The Puget Sound acts like a bathtub: being separated from the ocean as a small inlet, it has different characteristics than an ocean does. Pollutants from shipping vessels, recreational boats, and dumping grounds do not just wash out to sea. Instead, the Puget Sound collects all of the oil, plastic, and pollution that the surrounding communities produce. Rain washes pollutants off the streets and into the Puget Sound—pollutants like chemicals, oil, auto fluids, fertilizers, and litter. Most stormwater systems in Seattle do not involve treatment of the runoff water, which “can be so toxic that it kills fish in less than three hours” ([Pollution](#)).

With all of the pollution trapped in the Puget Sound, fish aren't

the only organisms that are dying. Due to ocean acidification, pollution, habitat destruction, phytoplankton are dying as well. With plankton resting at the very bottom of the food chain, a decrease in phytoplankton can have disastrous effects on the entire ecosystem. Without an abundance of phytoplankton, its natural predators (zooplankton, jellyfish, and krill) starve and are unable to nourish the next level of the food pyramid, which in turn can't sustain the next, and so on ([Spencer](#)). Without phytoplankton, the Puget Sound's and ocean's animals will starve, eventually leading to the extinction of marine wildlife indigenous to this area.

Dying Plankton, Dying Fish

In addition to being the most basic unit of marine life, phytoplankton processes carbon dioxide in the water through photosynthesis, extracting the carbon as bodybuilding material while releasing oxygen back into the ocean. In fact, the ocean provides the world with 50 percent of our oxygen; the vast majority of that oxygen being produced by phytoplankton ([sscsite2017](#)). When a large amount of phytoplankton is disrupted, a huge supply of the water's oxygen is taken away. Without the phytoplankton converting carbon dioxide into usable oxygen for the marine wildlife, marine animals suffocate and die.

Areas that are low in oxygen are known as “dead-zones,” and they are everywhere in the Puget Sound. In 2015, a record-breaking low in oxygen levels in the Puget Sound occurred in Hood Canal. Hood Canal has been known to have low oxygen levels in the late summer, but this year hundreds of rockfish, crabs, and even eels came out of their dens or up to the surface, trying to get more oxygen ([Ahearn](#)).

Since this is happening in the Sound itself, soon a lack of oxygen will spread to the entire Puget Sound region. Lifelong symptoms of hypoxia in humans are manifested through hypoxemia; when oxygen saturation levels in the body's hemoglobin cells drop. This

leads to an under-oxygenated individual. Lifelong hypoxia can lead to seizures, heart failure, chronic lung disease, higher infant mortality, lower lifespan, and the acceleration of any chronic respiratory disease ([Livina](#)). (Other health impacts of climate change can be found here: [Environmental Health Disparities in Seattle](#).) With the increase of pollutants in the Puget Sound, the phytoplankton indigenous to this area will die off, resulting in marine animal deaths through starvation and suffocation. This suffocation can reach humans as well, so it is imperative that we take care of our Puget Sound.



A YouTube element has been excluded from this version of the text. You can view it online here: <https://www.pressbooks.pub/121climatejustice/?p=441>

Conclusion

The Puget Sound area relies on its namesake. Climate change's effects on the water cycle and the marine life have serious consequences for Seattle and its surrounding communities. In order to protect Seattle from power shortages, the loss and destruction of indigenous wildlife, and human health risks, serious action needs to be taken to reform environmental policies. Seattle relies on the Puget Sound as a place of commerce and recreation, and now, we need to change our way of living in order to protect what cannot be replaced.

For more information about actions concerning environmental justice, visit [Organizing Efforts](#).

Media Attributions

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PART V

ORGANIZING EFFORTS

13. Companies VS. Climate Change: Priority or PR?

AYUSHI DESAI



PNW Seattle

Seattle, Washington is not only home to a booming tech industry, but also part of the Pacific North West known for its coastline, green interiors, and mountain ranges. Although a beautiful area immersed in nature, its own metropolitan area companies have been contributing to its environmental demise. In 2019, the Climate Accountability Institute revealed that only 20 large fossil fuel companies are directly responsible for a third of the world's greenhouse emissions. This data is astounding considering that some of these companies single handedly produce more carbon emissions than some large countries. The companies that are not directly in the fossil fuel industry are also heavy contributors to emissions and are considered runner ups to the 20 companies mentioned above.

If the majority of the problem stems from these companies, reducing their contribution and making up for the damage already done should be a large point of concern for the climate change advocates. In the past few years, as the climate crises has blown past simply a PR concern for companies, many have announced their plan of action. From our home-city of Seattle, Microsoft and Amazon are two large name international companies in the discussion of company roles in the climate crisis.

Basic Definitions

This chapter take a brief dive into the initiatives Microsoft and Amazon are taking to address environmental concerns. To do so, there are some terms that need to be defined in order to understand their plans and effectively compare them. A **carbon footprint** is the greenhouse gasses that have been emitted into the atmosphere through any company related activity. To address emissions, there are numerous actions that can be taken for the 'removal' of carbon from the atmosphere. The idea of **carbon offsets** is to address this carbon footprint through 'counteracting' the produced emissions somewhere else. This usually takes form of buying an offset to fund climate change combative projects or taking on these projects as the company itself. To learn more about Carbon Offsets and **Cap & Trade**, visit [chapter 6](#) here. This can allow companies to become **carbon neutral** during which there is no net release of carbon dioxide – in other words, the emissions would be countered by absorbing carbon through for example planting trees. The next step would be becoming **carbon negative** which means bringing the footprint lower than neutral and removing more than what is emitted. Finally, dealing with **historic carbon**, is working to removing all net carbon produced in the history of the company.

Microsoft

Microsoft, one of the largest international tech companies, has its headquarters in Redmond, Washington. After decades of contributing to the growing carbon in our atmosphere, the company announced some hefty climate commitments. Their detailed plan can be captured through three main goals: making the company carbon negative by 2030, removing all historical carbon emissions by 2050, and investing \$1 billion for the cause. The full blog from Microsoft's President Brad Smith can be found [here](#).

To achieve these ambitious goals, Microsoft has developed an

aggressive and clearly documented plan describes their plans to cut their carbon emissions in each major category. Their approach includes shifting towards a 100% renewable supply, electrifying all campus vehicles, introducing an internal carbon tax, etc. While there are various details involved with each step they are taking, overall, they have a data driven approach with clear goals and timeline. From an accountability standpoint, the company has announced an Environmental Sustainability Report which will provides annual updates on the company's progress for the public.



Microsoft President Brad Smith, Chief Financial Officer Amy Hood and CEO Satya Nadella preparing to announce Microsoft's plan to be carbon negative by 2030.

Beyond reducing the company's direct carbon emissions, Microsoft has made a clear effort to support new greener technologies by contributing \$1 billion dollars to the Climate Innovation Fund. They have pushing their goal of empowering their customers around the world through tools such as the Microsoft Sustainability Calculator, Vattenfall which allows customers to choose between green energies, etc. Additionally, the company has signed the United Nations' 1.5-degree Business Ambition Pledge, been vocal about carbon-related public policy issues, and had been leading other companies to do the same. Overall, Microsoft has taken a major leap in taking responsibility for their contribution to the climate

crisis, creating detailed and transparent plans to reach high green standards, and bringing other companies and their customers along with them to work towards carbon sequestration.

Amazon

Another major Seattle-based company name that often comes up in climate conversations is the E-commerce company Amazon. In recent years, the company has been criticized for not addressing the climate crisis and taking any action to mitigate their contribution to carbon emissions. After a year of pressure from Amazon workers for a company-wide plan, Amazon finally released a report of the company's environmental impact alongside some ambitious pledges in 2019. These goals include using 100% renewable energy by 2030 and reaching overall net carbon emissions by 2040. However, the pledges came in the form of a "Shipment Zero" announcement rather than a detailed plan of action. Their description of the project is limited to improving electrical vehicles, using reusable packaging, and moving towards renewable energy.

There are various concerns around this announcement that climate change advocates have found disappointing. For one, the company is only looking at reaching 'net zero' which means they will only add as many tons of greenhouse gases as those that are being removed. However, this doesn't address any of the damage that has already occurred since the company started and also allows pollution in vulnerable communities with solutions implemented elsewhere. Additionally, their entire plan solely focusses on the shipment aspect of the company which while considerably large, discounts pollution from the cloud computing business side of the company which is the largest of its kind in the world.

Shipment Zero: Not what it seems?

The science is clear: an emissions reduction of **45% below 2010 levels by 2030** is a vital first step in avoiding catastrophic warming.

2010



2030



Since Amazon will continue to grow, it can pollute more in 2030 than it did in 2010 and still fulfill its promise to provide **"50% of all Amazon shipments with net zero carbon by 2030."**

2010



2030



Sources: <https://www.ipcc.ch/src/2019/10/17/49602/climate-change-global-warming-in-ipc-report/>
<https://blog.aboutamazon.com/sustainability/delivering-shipment-zero-a-vision-for-net-zero-carbon-shipments>

A Vicious Cycle of Fossil Fuel Extraction: Amazon Web Services is How



Source: greenpeace.org/us/global-warming/ck-learn/, aws.amazon.com/oil-and-gas/

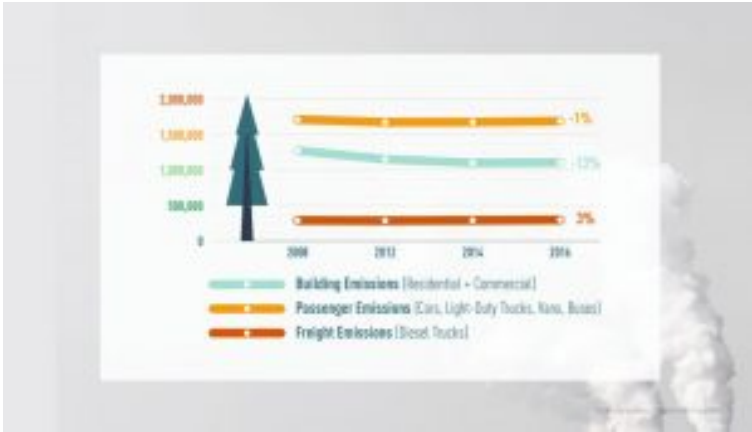
In June of 2020, the company made an announcement to invest \$2 billion to the Climate Pledge Fund in order to work towards a low-carbon economy. However, once again, their methodology to reaching their goals hasn't been fully shared with the public leading many people to believe that their actions are directly related to public pressure and need for good PR. Even within the information they have made public, Amazon's commitment has been questionable as they produced 15% more carbon dioxide in 2019 than 2018 (Clark, 2020).

Jeff Bezos personally committed \$10 billion dollars through his own initiative earlier this year which invests in various climate change projects, but this has somewhat overshadowed the shortcomings of his most famous company. However, his personal monetary donation doesn't represent the company's reduction of carbon emissions and environmental damage. Amazon's response to the climate crisis comes in stark contrast to that of Microsoft in terms of goals, timeline, outreach, and transparency.

Final Thoughts

Worldwide data very clearly indicates that large corporations play a disproportionately large role in producing fossil fuels, waste, and overall damage to our environment. While some companies have started becoming eco-friendly and plan on addressing or even reversing the damage that has been done, others fail to take responsibility or only do so to capitalize on the go green movement. This is significantly important to think about when trying to create progress against climate change because their actions have a large influence on global climate progress.

Just between Microsoft and Amazon, we see a stark contrast between the responsibility the companies are taking to address previous and current shortcomings. Microsoft has created numerous high impact goals that address various gaps contributing to environment damage and have very clearly outlined the systematic approach the plan on taking. By providing previous and current data on the company's emissions and the details that build their various interventions and initiatives, they are creating transparency with the public and encouraging to hold the company accountable. Overall, this approach has earned Microsoft a good reputation in the climate community as a sustainability leader (Roberts, 2020).



Despite efforts to reduce carbon emissions in Seattle, pollution is on the rise.

On the flip side, Amazon has been slow and vague in their response and although they have set their own goals, they have demonstrated very little accountability. Generally, it looks like the company has only been showing interest in the crisis due to external public pressure and they also have shown conflicting actions that don't support their initiatives. This has led to a lot of criticism from the climate community but also it's own workers who have been filing petitions to create more company-wide change (Reynolds 2020). Only time will tell how effectively these companies meet the goals they've set and whether they will take more initiatives to address and encourage reducing this crisis.

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- SeattleCO2-1024×585

14. Student Strikes and Walkouts

MICAH GLASBY

Student Walkouts for Climate Justice



Seattle Climate Rally, by Spencer Thomas – Creative Commons, Attribution

Students walkouts for Climate Justice is a phenomenon that has only recently taken root. These new protests have garnered attention from the news and other media agencies both locally and nationally. They are different from other forms of protest because they are made expressly by a demographic which cannot vote, and thus has no legal means to effecting policy changes. In this

particular case the desired policy changes are centered around climate change and social injustice. The goal of this report is to identify what the protestors do and do not want, and to provide the public with the tools to understand how to approach the conversation about climate justice with the youth.

Walkouts over the Years

While protests about climate change have been happening for decades, a recent surge in student walkouts for Climate Justice can be credited to one Ms. Greta Thunberg (Klein). In recent years she has enable the coordination of Global Climate Strikes, where students from all over the world march from their schools to demand that changes be made. As many as 1.4 million people have taken part in these protests, which shows that support is widespread, and that a large portion of the youth believe it is time for change (Carrington). It should be noted that in Seattle, every child that leaves the classroom is receiving an unexcused absence (Bush) . This policy, which does not directly prevent the students from striking, certainly does provide a risk and a hurdle to students who wish to join their peers in demanding change. Even in 2020, with all the COVID restrictions, the protests have continued, which further demonstrates how important students feel climate change is. Do not be mistaken, just because they are off the street does not mean they have gone away. The protesters are still around, though now they are using zoom and social media to demand change (Abnett). This does mean, however, that for now, as with many things, student walkouts have been halted. It is this writer's opinion, though, that the public can expect the protests to resume right where they left off when it is again safe to do so. This also means that these students should not be approached as a fad or a faze, because their adaptation and resilience indicate a drive that will not simply disappear with time .

Desires and Demands

Students are clearly willing to protest, but their demands can seem far less clear. In recent times a few demands have risen above the cacophony of different demands. The first demand is so nicely put in the concerns of a student named Lilah Amon-Lucas, “My life expectancy could be shortened because of how rapidly the climate is warming. I need to think about whether it makes sense to have kids” (Bush). The decision to have kids is one this is not far in the future. It is a decision many adults have considered, and so for the youth to be hesitant because of climate change shows just how pressing students feel the issue is. The other major demand is finely put by Hsieh, a Seattle student, “No one should be apologizing. Show us with your actions” (Sengupta). [This statement really sums up Seattle students desire not for more talk, but for action](#) by policy makes and influential leaders. These students have also embraced the Climate Justice movement with signs reading “Green New Deal, make it real,” and carrying signs that read “The sea is rising, so must we” and [they are demanding that the voices of the underrepresented be heard](#) (Sengupta). These are lofty goals, but these students also are making more tangible demands, [like for companies and politicians to stop supporting fossil fuels](#) (Sengupta). At the end of the day, these students want to see carbon dioxide levels go down, and they want to see quality of life improved for everyone, everywhere.

Results

With so many students from so many places around the worlds making so many requests, it can be difficult to sort out if they have achieved any results. While the following achievements may not be directly tied to the student walkouts for Climate Justice, they do demonstrate that changes are being made. [Strikers at Amazon demanded that the company go to being carbon-neutral](#), and

Amazon CEO Jeff Bezos responded by committing to employing 100,000 electric delivery vans that will start delivering packages in 2021 (King 5 Staff “Washington Students”). The European Union and China have also officially committed to being carbon neutral (Abnett). The future remains uncertain, and these victories are not the fulfillment of all the demands of the protesters, but they are signs that the protests may be working.

In Summary

At the end of the day, these students want change. They are willing to risk COVID and unexcused absences to make their claim, as they walk out of their classrooms and gather together in demonstration to demand climate justice. They want to see carbon dioxide levels fall. They want to politicians and [companies to stop investing in fossil fuels](#). They want a future with a higher quality of life for all, and they have seen some successes. Mainly, they want to have their concerns heard, and more than anything they want their elders to take action.

Media Attributions

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15. Activism through Art

Art plays a large role in how humans see and interact with the world and each other. No matter who you are, where you come from and how old you are, it is something that can be enjoyed and interpreted in a variety of ways. Unlike law or politics, things that are learned or take years to understand and practice, creativity is something we all already possess. The use of art in activism is a creative way to bring awareness and make involvement inviting to people of all ages and backgrounds. Activism through art can include music, film, paintings, drawings, photography, and even dressing up.



The concept of turning art into political climate activism is intended to turn data-based representations of the climate crisis into something more vivid and approachable. In Seattle, activism through art is used throughout protests, city murals and community-based programs. Craig Cundiff, a 32-year-old artist in Seattle recently dedicated a mural located in Georgetown to climate activism (<https://www.seattlemag.com/arts-and-culture/new-georgetown-protest-mural-takes-climate-change-south-seattle-air-pollution>). The mural portrays a young boy, Cundiff's son,

wearing a mask and goggles in front of a mass of cars caught in “Seattle traffic”, and an orange hazy sun shining through the wildfire smoke and pollution.



Cundiff's

“art-with-a-message” doesn’t necessarily contain any words to narrate it, but the message is interpreted by the eyes that read it. There are also community-based programs in Seattle that use art as a way to create young leaders, uplift and bring together low-income communities and people of color, and combat oppression such as Creative Justice and 350Seattle. 350Seattle dedicates a campaign for artistic activism where they share videos and photos of past protests, and songs, chants, and mantras to perform at events. The arts provide 350Seattle support for creative outreach and encourages people to participate despite experience or skills (<https://350seattle.org>). Creative Justice on the other hand, works toward building community among incarcerated youth by exploring the root of incarceration such as systematic racism and offers art instruction and creation to enhance skills and celebrate the strengths and creativity of young people (<https://www.creativejusticenw.org/cj-mission-vision>).

The arts can be a powerful way to encourage climate action and provide a different perspective. Today, the media plays a huge role in swaying opinions. However, there are typically other issues that dominate and hold priority for TV talk shows and news stations. If this is the case, and it is, we should cater to these business

interests. If filmmakers, actors and animators highlight the issue of climate change in their own creative ways we can use the media to influence opinion. People act out of having an emotional connection with the environment. If that emotional connection isn't there, they



won't care.

Producing and promoting art that engages people with the natural environment and inspires others to share their stories can create experiences and encourage human empathy to make this crisis feel more real.

Sadly, in the U.S. we are still fighting to prove that climate change is real to some people. However, many web series and films are creating a generation of environmental activists through their productions. “*The North Pole*” a web series that focuses on three friends facing environmental threats in their hometown is an example of the arts creating an accessible and entertaining way for people to be educated on the climate justice movement and climate change (<http://www.thenorthpoleshow.com>). Art can be appreciated and interpreted all over the world, especially when it is a crisis that the whole world is facing together. Greta Thunberg a 16-year-old Swedish activist known for challenging leaders all over the world to take immediate action against the climate crisis has served as a symbol for many artists in their artwork.



Jody Thomas an artist from Bristol, London painted a 50-foot mural of Greta Thunberg submerged in rising sea water, with the waterline just high enough to cover her mouth. The mural went viral and serves as a very strong message against the effects of climate change and the importance of using our voices to speak up for change before it is too late (<https://news.artnet.com/art-world/greta-thunberg-climate-art-1645336>).

The climate movement is often clouded by exhaustion, burnout and despair. Yet art can give climate activists a chance to keep their cause alive and provide a sense of hope and gratitude. Approaching the climate crisis in a creative way allows us to focus on what is actually changing and why we will miss it when it's gone. Whether it be through a photograph or a painted mural, taking the time to reflect enhances the sense of urgency within the climate justice movement. The arts act as a healing agent for many and is about a dream of something that has potential. Activism through art has the possibility for transformation, renewal and redemption.

Media Attributions

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16. #noLNGTacoma

PHONG LUU

The Tacoma LNG Facility

Puget Sound Energy is an energy company located in Washington state focused on providing a “safe, reliable, affordable energy service.” (PSE), They are currently building an LNG, aka liquified natural gas, facility at the port of Tacoma. The purpose of the facility is to provide these “natural” energies for customers and fueling maritime transportations, as a more environmentally safe solution against climate change.

The PSE Proposal

Puget Sound Energy proposes that there are many benefits of the LNG facility. One being that it is a cleaner solution compared to diesel. Stating that switching to LNG will reduce emissions of sulphur by 100%, harmful diesel matter by 90%, nitric oxide and nitrogen dioxide by 90%, and carbon emissions by 35% (Port of Tacoma). Another benefit is that there is no impact to the Commencement Bay, while also reducing the risks of accidental spills and stormwater pollutions. PSE says that “If LNG were to spill during fueling, however, it would turn into a vapor that dissipates if exposed to air. It would have no lasting effect on our waterways or marine life” (Port of Tacoma). PSE also proposes while providing fuel to ships will also provide natural gas to residential and commercial customers.

The Truth/Reality

While all these proposals may seem better for the future than diesel, in truth it does more harm to us. PSE argues that we need to have a present solution instead of waiting for years in the future for a carbon-free solution. They spent \$40,000 per month on public advertising to argue that LNG is “a cleaner fuel than bunker fuel and there are not better alternatives at this time” (Cleaner Tacoma). However, Cleaner Tacoma explains that “the German-based MAN

Energy Solutions expects to have the first fuel ammonia ship by 2022” (Cleaner Tacoma). This explains how PSE is lacking vision for the future, when in fact carbon-free ammonia ships are less than two years away.

The group 350Seattle argues, for example, that it will “lock us into decades of fossil fuel use, threaten local health and safety, and place a huge financial burden on PSE residential customers who will only receive a fraction of the benefit” (350Seattle). This shows that while PSE is right that this is a better solution, it still is not the complete solution we need for climate change. Even when PSE says that this plant benefits residential and commercial customers, it is violating the Puyallup tribe’s rights to the land and Salish sea through the Medicine Creek treaty. Also, the facility was built despite not having all the necessary permits beforehand and “despite the lack of legally mandated tribal consultation” (350Seattle).

The activist group 350 Seattle demonstrates that the city of Tacoma gave PSE an environmental impact study without any modelling of what could happen if the plant were to have an accident. This means residents do not know the degree to which they are put at risk in case of an accident or the 24-hours-a-day emissions of toxins and carcinogens. Studies have shown that these emissions can cause “birth defects, neurological disorders, respiratory issues, and asthma.” Even further, the permits only cover individual facilities and not the combinations of toxins of the neighboring facilities. Because the facilities are placed on tribal lands, this contributes to “historical racism and genocide.”

Finally, the residents of Tacoma are paying for almost half of the construction costs for the facility (\$133 million). To make matters worse, if there were an accident such as an explosion PSE could declare bankruptcy which would lead to them not paying for the damages leaving residents the responsibility of the repairs.

Climate Justice Movement

This leads us to the bigger picture. While the climate justice movement aims for a future of a carbon-free society, companies such as PSE need to be changed and made liable for the things they

do. There are many ways you could be involved. There have been protests near the facility's construction site to shut it down. The Puyallup tribe have made a documentary called *Ancestral Waters*. Local tribes and with the addition of tens of thousands of people have signed a letter opposing the project. There has also been lots of social media coverage such as #FrackOffPSE #NoLNG253 #StandWithPuyallup #Honorthetreaties #EnvironmentalRacism.

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