

Lifting Up What Works®

PolicyLink

Understanding Climate Change

An Equitable Framework

Serena W. Lin

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Preface

As the world grapples with the massive effects of climate change and global warming, the need to understand the embedded issues associated with these complex ecological transformations becomes clear. PolicyLink commissioned *Understanding Climate Change: An Equitable Framework* to contribute to a deeper understanding of the issues and to encourage everyone to participate in the discussion and to weigh in on proposed solutions. Climate change ultimately affects all of us, and the most vulnerable populations—nationally and globally—will bear the brunt of this crisis if action is not taken.

We hope this paper will inspire readers to seek information and to become advocates for solutions that are effective, fair, and equitable. PolicyLink is indebted to Serena W. Lin for writing *Understanding Climate Change: An Equitable Framework* and presenting the issues of climate change as she sees them. This thought-provoking work considers the equity consequences and implications associated with global warming.

We welcome your thoughts and reactions to this piece by emailing PolicyLink at climatechange@policylink.org or the author at Lin.W.Serena@gmail.com.



Angela Glover Blackwell
Founder and CEO
PolicyLink

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Climate scientists have long warned that global warming could spur deadly disease epidemics. The study suggests that such a scenario may already be unfolding in the amphibian world. If so, humans and other species should consider themselves duly warned. Because amphibians are particularly sensitive to environmental change, they may serve as proverbial "canaries in a coal mine" that warn of such climate change dangers.

-Brian Handwerk,
National Geographic Magazine,
"Frog Extinctions Linked to Global
Warming,"
January 12, 2006



Introduction

There is a proverb about frogs that some people like to recite. It goes something like this: throw a bunch of frogs in a pot of boiling water, and they will jump out immediately. If you put the frogs in cold water and bring them slowly to a boil, then the frogs won't comprehend the danger. By the time the frogs become alarmed, it will be too late for them.

Are we the frogs? Is our earth the pot? Are we unwilling to save ourselves because we don't feel the immediacy of the heat?

We are not a bunch of frogs. Yet, when confronted with the thought of global warming, many people do feel stuck in a boiling pot; they feel overwhelmed and disempowered. Therefore, they are much more likely to feel that they cannot turn down the temperature. But the solutions to global warming lie in collective human understanding and action, as much as they do in technological fixes. Humans (to differing extents) turned up the heat. Together, we can turn it down.

Climate change is one of the most important social, economic, human rights, and community health issues facing our nation and our world. It is not, and should not be framed as, solely an environmental or scientific issue. Otherwise, global warming runs the risk of being disconnected from everyday people who experience it, well, every day. The questions and answers for climate change take root in the very economic and social structures that equity advocates already understand. It stands to reason that equity advocates have the tools to lead the charge on climate change.

Most equity advocates have long been concerned about quality of life: how do communities defeat poverty and prevent blight? How do we create healthy places? Global warming is already here. The increase in the

earth's surface temperature and the desire to slow and ultimately stop this increase is universal. It is a myth that people of color and poor communities do not care about global warming. They do care about it because they care about their kids who have asthma; they care about the power plant in their backyard that spews mercury; they care about how far they have to drive or take a bus or rail to work, how much more they must pay for their energy bills, whether they have access to fresh and affordable food, and whether or not they can get a job or buy a home. Under-resourced communities also care about what they could do in the case of difficult or extreme weather events—people who already lack resources have the least ability to adapt to heat waves, hurricanes, droughts, power blackouts, loss of crops, and public health risks, including poor air quality.

Global warming has gained well-deserved, widespread recognition as a challenge. We must now acknowledge that climate change is fundamentally an issue of fairness for all of us and for our earth. It is an issue that can move forward collective action, coalition-building, and grassroots organizing in conjunction with science, policy, and law. Addressing climate change allows us to forge connections with people from all walks of life and from many different belief systems because we all want a better quality of life, and because we all care about our children. It is an issue that can bring people together. The impacts of climate change and the solutions will significantly affect all communities. And all communities, including those most vulnerable to the physical and social effects of climate change, must be at the table for the discussion.

While not all equity advocates are environmentalists, and not all environmentalists are equity advocates, this framework focuses on the many people and groups that are.



We Share One Sky—We Breathe the Same Air

This paper does not purport to explain climatology or provide an in-depth description of climate chemistry. The science in this area is rapidly advancing, and the international body that best documents the phenomenon of climate change is the Intergovernmental Panel on Climate Change (IPCC), Nobel Peace Prize co-recipient. The film *An Inconvenient Truth*, by Al Gore, Nobel Peace Prize co-recipient and former vice president, also does a good job of explaining the basic science.

One key concept to remember is that the earth's atmosphere is a delicately balanced interactive system. Human activity that adds to or subtracts from the atmosphere in one place can combine with many other parts of the atmospheric system to cause widespread atmospheric warming. The complex, interactive nature of the earth's climate system makes cause and subsequent effect difficult to establish.

The world is already warming. The 22 hottest years in recorded human history have occurred since 1980. The earth's surface temperature has increased by about 1.4 degrees Fahrenheit (°F) during the last century. Global warming is increasing at an alarmingly fast clip, and global average temperatures are estimated to rise some 3.24°F to 7.2°F over the next century. While these numbers may seem relatively insignificant—some would assume it results in nothing more annoying, or more pleasant, than a hotter summer and a milder winter—consider that in the 100,000 years of human existence, the planet has never been more than a degree or two warmer than it is today.¹ According to one scientist, a rise of just 2.1°F will expose between 2.3 and 3 billion people to the risk of water shortages.²

Climate and weather are two different concepts. Climate is the average temperature of a geographic area, or average weather, over a period of years. Weather is the

specific temperature at a specific place and time or day. One practical way to think about the difference between climate and weather is that over the next twenty years, due to global warming, a region like Los Angeles, which has a Mediterranean climate characterized by dry summers, rainy winters, and moderate transitions between those seasons, may transform into an arid desert climate. In a desert climate, the weather on any given day in the next twenty years will probably be hot and dry, and precipitation will be more infrequent but possibly heavier when it does fall. Still, it will be hard to predict the exact weather on a given day. If a large, heavily populated metropolitan region such as Los Angeles were to undergo further desertification, it would exacerbate already difficult water management and water rights issues, as well as spikes in energy use. Severe weather throughout the world will become more frequent with climate change, resulting in more intense hurricanes, increased rain, and prolonged drought.

What is causing the world to heat up? Human activities, primarily involving energy use and fossil-fuel consumption (oil, coal, and natural gas), transportation, agriculture, and deforestation, are producing greenhouse gases (GHGs) in greater abundance. From industrial manufacturing, to livestock farming, to driving in cars and trucks, to flying around in airplanes, to shipping things from one part of the world to another, to watering lawns, to throwing away trash, to shopping for groceries, to simply turning on our lights—many basic activities that we take for granted cause an increase in the production of air pollutants that include greenhouse gases. These human-produced GHGs trap more heat in the atmosphere, like a greenhouse, and cause the surface temperature of the earth to increase. Another way to think about the cause of global warming is this: a thin blanket of gases is wrapped around the earth and it is warm enough to support life.³ Without

these gases, the earth would be a cold, barren rock incapable of sustaining life. Gases like nitrogen (which makes up 78 percent of atmospheric gases) and oxygen (at 21 percent) constitute the primary fabric of life on this earth.⁴ But, over time, the added human-caused GHG emissions have made the blanket thicker, more suffocating, and ultimately, more effective at trapping heat. The six main GHGs listed by the Kyoto Protocol and examples of the human activities that release them⁵ are:

Carbon Dioxide (CO₂)

- burning of fossil fuels
- oil
- coal and natural gas for energy, industry, and transportation

Methane (CH₄)

- landfills and livestock farming

Nitrous oxide, (N₂O)

- agricultural fertilizers
- burning of fossil fuels

Hydrofluorocarbons (HFCs)

- refrigeration
- air conditioning
- solvents
- aerosol propellants

Perfluorocarbons, (PFCs)

- byproducts of aluminum smelting
- semi-conductor manufacturing
- substitute for ozone-depleting chemicals

Sulphur hexafluoride (SF₆)

- car tires
- electrical insulation
- magnesium industry

Since pre-industrial times, human activity has caused levels of CO₂ to increase 35 percent, levels of CH₄ to increase 155 percent, and levels of N₂O to increase 18 percent.⁶ The other three GHGs exist in miniscule amounts naturally and are in circulation almost wholly

because of human activities. Due to the interactive nature of these greenhouse gases with the atmosphere, however, it is impossible to say exactly how much each gas actually causes climate change. The general policy consensus is that CO₂ is likely responsible for half of human-caused global warming. Because every greenhouse gas can be a significant source of global warming, all the GHGs listed in the Kyoto Protocol, not just CO₂, should be addressed in order to stem global warming.

Human-produced GHGs remain in the atmosphere for many years, meaning that some global warming cannot be avoided entirely. While these gases are produced naturally in the atmosphere, other biological processes tend to consume them. But these processes cannot eliminate the high levels of man-made GHGs, and these GHGs can remain in the atmosphere for years. CO₂ lasts in the atmosphere from 50 to 200 years. Methane, which is 23 times more effective at warming the atmosphere than CO₂, lasts 12 years and eventually decays into CO₂. N₂O can last about 114 years and has a global warming potential (GWP) 296 times more powerful than CO₂ (which is set at a GWP of 1). HFCs are 20,000 times more powerful and remain in the atmosphere for up to 260 years. PFCs have a GWP of about 5,700-10,000 and remain for up to 50,000 years. SF₆ has a GWP of 23,900 and remains for 200 years.

Energy consumption and transportation in the United States affect the entire world. While it has only roughly 5 percent of the world's population, the United States contributes nearly one-quarter of all GHG emissions.⁷ The most commonly cited target to help balance the climate and reduce global warming is for the United States to reduce its carbon dioxide emissions to 1990 levels by 2050, a cut of 60 to 80 percent. The Kyoto Protocol called for the United States to reduce its GHG emissions 7 percent from 1990 levels by 2012.⁸ However, total United States emissions have increased an estimated 16 percent from 1990 to 2005. While different reduction targets have been suggested, Kyoto broke new ground by putting GHG inventories into the realm of public attention. One of its central principles was the recognition that rich countries such as the United States must reduce proportionately more GHG emissions and reduce them more quickly.

Resources Guides for Scientific Research from Scientific Bodies:

Intergovernmental Panel on Climate Change
www.ipcc.ch/

American Geophysical Union
www.agu.org

National Center for Atmospheric Research
www.ncar.ucar.edu/

NASA Goddard Institute for Space Studies
www.giss.nasa.gov/

Resource Guides for Scientific Research from Advocacy Groups:

Environmental Defense Fund
www.edf.org/home.cfm

PEW Center on Climate Change
www.pewclimate.org/

Physicians for Social Responsibility
www.psr.org/site/PageServer?pagename=Home

Sierra Club
www.sierraclub.org/

Books:

Climate Change, Shelley Tanaka, 2006.

Climate Change: What it Means for Us, Our Children, and Our Grandchildren, ed. Joseph F.C. DiMento, Pamela M. Doughman, 2007.

Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change, ed. Susanne C. Moser, Lisa Dilling, 2007.

Global Warming and Climate Change, Emma Carlson Berne, 2007.

Heat: How to Stop the Planet From Burning, George Monbiot, with research assistance from Dr. Matthew Prescott, 2007.

The Atlas of Climate Change: Mapping the World's Greatest Challenge, Kristin Dow and Thomas E. Downing, 2006.

The Weather Makers: How Man is Changing the Climate and What It Means for Life on Earth, Tim Flannery, 2006.



Why Should You Care?

There is scientific consensus that Americans need to reduce emissions immediately because climate change is not around the corner—it is already here. The average global temperature has risen at least 1.4°F over the past 100 years; three-quarters of that increase has happened in the past 30 years.⁹ Mitigation measures are important, but if we don't find solutions that work sooner rather than later, we run the risk of treading water in an increasingly stormy ocean. In fact, we may not all make it to shore. It is difficult to hear and to say, but the truth is: with our present technology, we cannot entirely prevent global warming. We cannot turn back the clock and live in denial. We can make the best of the predicament in which we find ourselves by understanding the problem, diminishing our fear,⁹ and learning how to swim.

In his acceptance speech for the Nobel Peace Prize in 2007, the chairman of the IPCC, Dr. R.K. Pachauri, made a stirring call for equity. Specifically, he warned that scholars in the social sciences have not paid enough attention to the equity implications of climate change. He framed the issue of climate change as one of peace and security, citing the potential threats of mass migration, conflict, and war over scarce resources, as well as the potential realignment of power between nations. While acknowledging that he was the head of a scientific body that could not prescribe policy, he stated¹⁰:

Peace can be defined as security and the secure access to resources that are essential for living. A disruption in such access could prove disruptive of peace. In this regard, climate change will have several implications, as numerous adverse impacts are expected for some populations in terms of:

- access to clean water
- access to sufficient food

- stable health conditions
- ecosystem resources
- security of settlements

Perhaps one of the most important climate change truths and most fundamental issues of fairness revolves around the fact that all of us must work together to stop global warming. But the harms of inevitable climate change will not fall upon us equally or fairly. In fact, those of us who have the least resources in terms of money and health care are also the least equipped to adapt to large-scale climate change. The irony is rife: internationally and domestically, those of us with the least resources are also the *least* responsible for causing global warming. Here is what we face¹¹:

Heat Waves

As average temperatures rise, hot days will get even hotter, and there will be more of them. People who can afford air conditioning will be protected, but the poor, the elderly, and the sick will be jeopardized. City centers must contend with the urban heat island effect, which occurs when the built concrete and asphalt environment actually traps heat and increases temperatures in central cities. In some places, urban heat islands are nearly 5°F higher than surrounding areas. Heat also releases allergens including pollen and mold, triggering conditions such as asthma in children.

Heat waves are more dangerous for socially vulnerable people and people of color. In 1995, a dramatic heat wave in Chicago caused the deaths of approximately 739 people and thousands of heat-related illnesses.¹² Many of those who died were low-income, elderly, ill or bedridden, living alone, isolated, and without an air

conditioner. Proportionate to their total population in the city, African Americans suffered the most loss—sustaining a mortality ratio of 1.5 to 1 as compared to whites. Researcher Eric Klinenberg, who investigated the 1995 heat wave in his book *Heat Wave: A Social Autopsy of Disaster in Chicago*, observed that many of the African Americans who died lived in crumbling, disinvested neighborhoods that lacked infrastructure and suffered from abandonment. These social factors and others will come into play in determining who suffers most from the effects of global warming. In areas where severe heat waves already occur, they will intensify in magnitude and duration. Chicago is projected to experience 25 percent more frequent heat waves annually.¹³

Rising Sea Level¹⁴

Climate change will have the strongest impacts on coastal cities. Shrinking glaciers and melting sea ice will be particularly damaging to low-lying areas. By the end of the century, global sea levels could rise as much as three feet. In Bangladesh, that rise would flood up to 17 percent of the country. Current sea-level rise is irreparably harming the culture and livelihood of many island residents, for example in Indonesia, the Philippines, Tuvalu, and the Marshall Islands. Left unchecked, the sea may eventually swallow the homes of entire civilizations. In the United States, 54 percent of the population lives near coastal areas. The Southeast and Mid-Atlantic coasts, as well as low-lying areas such as the Florida coast, North Carolina's Outer Banks, and Los Angeles will be affected. Already, 80 percent of Atlantic beaches are eroding, affecting the tourism industry and homes in those areas.

Drought and Precarious Fresh-Water Supplies¹⁵

We are experiencing extended multi-year droughts in several regions of the United States. Climate change will intensify the severity of droughts. On a political level, we are already witnessing water wars, such as the recent one between Georgia, Florida, and Alabama—all of which share water sources while undergoing extended drought. While overall levels of precipitation are expected to increase, shifts and changes in the types and timing of precipitation will increase the proportion of winter precipitation composed of rain, and lower the amount composed of snow. Snow-pack levels that feed fresh-water basins will melt earlier in the season and supply less water. Also, higher evaporation levels accompany higher temperatures. All of this means that many regions will have fewer fresh-water supplies and increased precipitation.

Water-management and security issues are likely to amplify as increased rainfall might also mean more urban run-off from storm-water. Water resources are already dwindling and over-committed in the United States, and climate change is anticipated to intensify water demand in some areas. Water pollution will become even more intolerable to thirsty communities as fresh-water supplies suffer. Complex jurisdictional and governmental issues will add challenges to maintaining a sufficient fresh-water supply.¹⁶ Hot temperatures, coupled with drought, are projected to lead to greater risk of wildfires.

Public Health Threats¹⁷

Global warming will lead to increased amounts of surface-level ozone and smog. Pollen levels are already on the rise, causing strong allergic reactions. Hotter temperatures and increased rainfall are likely to increase the populations of insects and animals that are carriers of human diseases. West Nile virus, Lyme disease, malaria, dengue fever, yellow fever, and encephalitis could spread farther and faster. Poor water quality can lead to gastrointestinal illness. Increased wildfire incidents would release high levels of air pollutants that decrease lung function.

Public health advocates have identified many urgent public health threats due to climate change, including damage to sanitation infrastructure, acute trauma from mass displacement (witness, for example, the depression caused by large-scale population displacement in New Orleans following Hurricanes Katrina and Rita), and a rise in infectious diseases.¹⁸ The public health community is also concerned with human behavioral patterns linked to both GHG emissions and adverse physical health effects, including poor community design; increased driving rather than walking, biking, or riding transit; and increased consumption of meat.¹⁹

Decreased Food Security²⁰

Climate change will threaten food security. The impact will be most powerful in communities outside of the United States, and increased food prices will have a disproportionate impact on lower-income communities and communities of color. Food travels thousands of miles and accounts for high volumes of CO₂ and other GHG emissions in the United States each year. A substantial number of food miles are generated by global trade in fresh and organic produce to feed United States consumers and give them greater food selection. Livestock ranching produces high levels of methane around the world. Furthermore, large-scale agribusiness in the United States is a significant source of GHG

pollution because it is extremely energy and water-intensive. The capacity of developing countries to sustain agricultural production will be challenged, and wealthier countries will continue to import food while the poor will experience heightened levels of malnutrition and starvation. Subsistence farmers and local fishing communities across the United States will continue to be negatively affected by global warming. There is also considerable controversy over whether alternative fuels utilizing agricultural production (including bio-fuels) will further diminish food supplies.

Disproportionate Impact on Indigenous Peoples²¹

Indigenous people, including American tribes, have been leaders in the environmental movement internationally and domestically. The Indigenous Environmental Network²² held its 15th annual Protecting Mother Earth Conference from July 17-20, 2008, and has developed an extensive climate justice framework in regards to sustainability, clean energy, clean air, climate change, and economic development. Of particular concern to many Native American communities are current energy practices, including coal bed methane extraction in New Mexico and nuclear waste disposal on tribal lands. Future United States energy policy can be shaped to either harm or benefit Native Americans and Alaskan

Natives. Native Alaskan communities already find it difficult to sustain themselves, with temperature increases, deforestation, water pollution, and the decline in fish species.

Raising issues of faith, global warming threatens the physical and cultural survival of many indigenous populations. All over the world, including in the United States, native peoples have fewer resources with which to counteract climate change. In particular, many ancient and important indigenous cultural artifacts and spiritual practices will suffer grave harm with the destruction of natural landscapes, sacred land, and sacred waters.

Ecosystem Disruption and Species Extinction

Nearly 14.2 million hectares of tropical forest are being destroyed by developing nations that suffer in the global economy.²³ Polar bears, the Bengal tiger, dolphins, thousands of flora and fauna, sea coral, and amphibians are all struggling to survive and adapt to changing habitats. Dozens of species of mountain frogs in Central America have been wiped out over the past 20 years. If human beings do not drastically lower their levels of consumption of natural resources, many more animal and plant populations will become extinct.





4 Global Warming and Air Pollution: An Inseparable Pair

The atmosphere is a dynamic, interactive system. Tim Flannery called it the “great aerial ocean” in his book *The Weather Makers*. For scientific purposes, it is important to possess a basic understanding of climate change and to understand how gases produced by human activities trap heat in the atmosphere. But this scientific understanding does not come with a prescribed policy solution to global warming because there is not a broad policy consensus as to how to stop climate change or even mitigate its effects. We can examine the human sources responsible for the warming of the atmosphere and use the science about how GHGs trap heat in the atmosphere to inform our decisions. Climate science, like the climate, is dynamic and rapidly changing.

Understanding the science of global warming without exploring the human interpretations of scientific evidence is practically impossible. For example, it is widely acknowledged that the Kyoto Protocol was both a scientific and political document; there was a great deal of negotiation to determine emission targets and decide which GHGs would be listed. Most human activities that produce greenhouse gases also produce other air pollutants that are more immediately dangerous to human beings than CO₂. Studies have suggested that because CO₂ is invisible and because we breathe it without getting sick, many people have a harder time perceiving its danger.²⁴ Therefore, it may be increasingly important to make the links between greenhouse gases, global warming, and air quality.

One of the most important air pollutants is smog. The primary component of smog is ground-level ozone, also known as tropospheric ozone. Although it is not listed in the Kyoto Protocol as one of the top six GHGs, ozone is a greenhouse gas: ground-level ozone traps heat in the earth’s atmosphere. Ozone also exists higher up in the atmosphere, in a layer known as the stratosphere. This

can be confusing because in the stratosphere, ozone is an important gas for *protecting* human health. It absorbs and deflects the sun’s ultraviolet rays. These rays can cause skin cancer and eye cataracts, destroy plankton and the ocean food chain, and harm the soft tissue of frogs and seals. The ozone hole that many people feared in earlier decades is *not* smog or ground-level ozone—it is stratospheric ozone. In our interactive climate system, global warming is thought to lead to harmful stratospheric ozone destruction in polar regions.²⁵

When it lies lower in the troposphere, ozone has harmful human health consequences. It can cause shortness of breath; increase the likelihood of asthma attacks, chest pains, and wheezing; and impair lung function or inflame the lungs. For instance, families living next to heavily traveled transportation corridors often suffer from heart and breathing problems. Diesel trucks and trains, integral components of our goods-movement system, are known to emit many of the air particles that form ground-level ozone. Some places, such as the state of California, have passed laws to prevent the construction of schools next to freeways because of the health consequences related to diesel cars and trucks. Exhaust from diesel is also likely carcinogenic.²⁶ Smog is most dangerous to children, the elderly, and those with respiratory problems.²⁷ Another component of smog is particulate matter, which is also emitted by diesel trucks and power plants. Particulate matter is especially dangerous in its smaller sizes because it is less likely to be filtered out by our noses and can end up in our lungs.

Automobiles and power plants do not emit smog directly. Instead, it is a dirty soup cooked up in a complex photochemical reaction that uses the ingredients of sunlight, methane, carbon monoxide, nitrogen oxides (NOx) (emitted from power plants and diesel engines), and volatile organic compounds (VOCs) (emitted from

household products such as paint). Technically, NO_x does have one beneficial side effect—it limits methane levels and thereby diminishes methane's greenhouse effect. But NO_x has many devastating health consequences. In addition to being a critical component of smog, it can combine with other substances to form acid rain. The significant negative impacts of NO_x must be considered alongside its positive ability to regulate methane.²⁸ Significantly, some scientists have highlighted the fact that reducing methane would yield the important double benefit of reducing smog.²⁹

Ground-level ozone can act as both a direct and indirect greenhouse gas. Indirectly, ground-level ozone erodes the ability of plants and trees to absorb carbon dioxide. High concentrations of ozone affect the health of trees and stunt their ability to metabolize carbon.³⁰ Vegetation is an important carbon sink, meaning that we depend on plants and trees to absorb CO₂ and keep the atmosphere in balance. Ozone may have a more significant impact on CO₂ levels than originally thought because it affects tree health.³¹

The wind carries ground-level ozone past industrial areas. In an ironic twist, scientific evidence has shown ground-level ozone is more damaging to rural trees than urban trees. In rural areas, the air pollutant NO_x, which can decrease levels of ground-level ozone and methane, does not exist at the same higher levels as it does in urban areas. Some policy implications are clear: there are regional, rather than just local, impacts to ozone formation; further scientific research on the importance of ozone as a GHG is needed; and tree planting may be a smaller part of the solution to global warming than originally thought.

The scientific literature on the contribution of ground-level ozone to global warming is still developing. Ground-level ozone is difficult to measure. It has a short lifespan; its concentrations vary widely from place to place; and its source can be difficult. For example, some of the ground-level ozone in coastal cities is thought to be driven by trade winds that carry air pollution across the ocean. This air pollution eventually becomes part of the photochemical reaction producing smog. The scientific challenge of pinpointing a specific source for smog has affected policy because it is more difficult to inventory ground-level ozone than, for instance, CO₂ or methane. These complexities do not make ground-level ozone any less deadly or less important in causing global warming.

Another greenhouse gas that was not listed in the Kyoto Protocol but has a significant impact on both warming the atmosphere and human health is black carbon, also known as soot. Soot is one type of particulate matter. On October 18, 2007, Mark Jacobson, director of Stanford University's Atmosphere/Energy program, testified before

the House Committee on Oversight and Government Reform that:

Fossil-fuel and bio-fuel burning soot particles containing black carbon have a strong probability of being the second-leading cause of global warming after carbon dioxide and ahead of methane. Because of the short lifetime of soot relative to greenhouse gases, control of soot, particularly from fossil fuels, is very likely to be the fastest method of slowing warming.³²

Soot particles were shown to have an extremely short lifetime in the atmosphere (one to four weeks) relative to other greenhouse gases but an extremely high impact on raising surface temperatures on Earth. Our interactive climate makes it difficult to determine the exact causes of global warming. A small amount of one particular GHG might actually be more responsible for global warming than another GHG. Scientists continue to scrutinize the impact of black carbon on global warming.³³

Produced primarily by coal-fired power plants, diesel trucks, and industry, soot creates particle pollution, a dangerous air pollutant. Particulate matter can lead to heart attacks and strokes, induce irregular heartbeats, irritate the lungs, and aggravate asthma.³⁴ A report released in 2000 found that particulate matter released by U.S. power plants led to more than 30,000 deaths each year and that reducing power plant emissions by 75 percent could avoid more than 18,000 of the deaths caused by particle pollution.³⁵

On a practical level, current policy interpretations and applications of atmospheric science have led to missed opportunities to form partnerships between local community organizing groups and policy-based groups on litigation and legislation that combines air quality and climate change. Recently, an environmental justice advocate contacted a government agency to obtain help for a locally unwanted land use producing vast amounts of air pollutants. The polluting source was also contaminating the water of predominantly poor communities of color. In a friendly conversation, the staff attorney informed the advocate that at the moment, the agency's focus in both litigation and public comment was on global warming, not on air and water quality. The message was clear: we won't deal with the individual polluting source—we will tackle the overall land use plan that leads to climate change.

This example does not describe rare or uncommon themes or responses to the global warming phenomenon. Many groups, both grassroots groups and mainstream environmental organizations, as well as government agencies, operate with an explicit or implicit divide between air quality and climate change. Many

people do not believe these two areas overlap. This division is artificial, and it is constructed by social values and policy, not necessarily by sound science. In the great atmospheric ocean, everything mixes.

How we frame global warming as an issue can affect all of us and our priorities. If we don't get it right in the United States, it will be to the detriment of our communities and of the global community. That is why equity advocates must continue to reframe the debate on global warming to place it squarely in the arena of human beings. One way to shift the picture is to express our concern for its impacts on the most socially vulnerable and on the human sources of GHGs, including toxic sources. Climate science is often seen as arcane (how many of your eyes glazed over as you started to read this section?), and some environmental policymakers portray the scientific consensus as excluding air quality issues, or at best, as putting air quality issues in the backseat—air quality as a *secondary* concern.

But as these examples have shown, the relationship between power sources, polluting sources, and greenhouse gases is complex. No bright line demarcates a source of pollution as a GHG vs. an air pollutant. In fact, trucks, ships, trains, coal-fired power plants, and heavy industry emit high levels of GHGs and other harmful air pollutants at the same time. Sometimes, as in the case of smog and black carbon, the GHG and the harmful air toxin is the same thing. Over time, global warming exacerbates the formation of ground-level ozone/smog, which is formed in part by a chemical reaction needing light or heat.

What about CO₂? Carbon dioxide is the most significant GHG because humans have produced the most of it. Further, CO₂ inventories are a direct way of tracking our ability to slow global warming. These inventories reflect human consumption and waste. However, because very few combustion sources that produce CO₂ emit it by itself, it would make sense that when we shut down a source of toxic pollution, we reduce CO₂ emissions. The reverse would also seem to be true: when people reduce CO₂ emissions, they are reducing other toxic emissions.

Not all polluting sources generate all air pollutants equally, and not all polluting sources are located equitably. It is possible, but not necessarily desirable, to lower CO₂ emissions in a region while some polluting sources maintain or increase their emission levels in a locality. Families living near the polluting source will suffer most; those who live farther away will benefit from the long arm of overall GHG reductions and remain relatively unharmed by the shorter reach of toxic air pollution.

Equity issues can become separated from reducing global warming when it comes to deciding which mitigation and reduction measures we implement. When we target CO₂ by itself, we also tend to craft policies that ignore the significant human health impacts and high, frequently localized concentrations of CO₂ and its co-pollutants. Our natural human tendencies kick in, and we begin to make assumptions without closely examining the framework that we use. Shifts in policy and priorities arise depending on which GHGs are prioritized, such as methane or HFCs or smog, as opposed to CO₂. For equity purposes, it is undesirable to have the conversation about climate change revolve around CO₂ alone.

Resources on Strategies Addressing Climate Change:

Alternatives for Community and Environment

www.ace-ej.org

Asian Pacific Environmental Network

www.apen4ej.org

California Interfaith Power & Light

www.interfaithpower.org

California Rural Legal Assistance, Inc.

www.crla.org

Carbon Trade Watch

www.carbontradewatch.org

Center on Race, Poverty, and the Environment

www.crpe-ej.org

Clinton Climate Initiative

www.clintonfoundation.org/cf-pgm-cci-home.htm

Communities for a Better Environment

www.cbecal.org

Deep South Center for Environmental Justice

www.dscej.org

Environment CA

www.environmentcalifornia.org

Environmental Defense Fund

www.edf.org/home.cfm

Environmental Health Coalition

www.environmentalhealth.org/about.html

Friends of the Earth

www.foe.org

Grassroots Global Justice

www.ggjalliance.org

Greenpeace

www.greenpeace.org/usa

Indigenous Environmental Network

www.ienearth.org

Interfaith Center on Corporate Responsibility

www.iccr.org

International Council for Local Environmental Initiatives

www.iclei.org

Jessie Smith Noyes Foundation

www.noyes.org

Kentuckians for the Commonwealth

www.kftc.org

National Audubon Society

www.audubon.org

National Wildlife Federation

www.nwf.org

Natural Resources Defense Council

www.nrdc.org

People of Color Environmental Groups Directory

www.ejrc.cau.edu/projectpoc.htm

PEW Center on Global Climate Change

www.pewclimate.org

Rainforest Action Network

www.ran.org

Redefining Progress

www.rprogress.org

Rising Tide North America

www.risingtidenorthamerica.org/wordpress/category/front-page/

Sierra Club

www.sierraclub.org

Southwest Network for Environmental and Economic Justice

www.sneej.org

Union of Concerned Scientists

www.ucsusa.org

WE ACT, Inc.

www.weact.org



5

Energy Independence: Common Ground?

The prioritization of global warming over air quality is a short-sighted framework, and it is not supported by science. It is as much caused by spikes in popular interest and media attention as it is a policy decision influenced by funders and politicians. In truth, the sources of both poor air quality and global warming are often the same. In addition, mainstream environmental groups, as well as environmental justice groups, have long battled the fossil-fuel industry and the extensive damage it has caused the environment. For example, the most profitable company in the world, ExxonMobil, spent quite a bit of money debunking scientific warnings that global warming was a real and growing problem. ExxonMobil funded organizations to spread the message that global warming was far from certain.³⁶ It opposed the United States becoming a signatory to the Kyoto Protocol.

Despite common ground, environmental justice advocates have historically criticized mainstream environmental organizations for failing to act on the existing practice of locating oil refineries, power plants, and heavy industry in low-income communities of color. Environmental justice advocates have also rebuked the “Group of Ten”³⁷ for absorbing the lion’s share of funding on environmental issues while giving short shrift in their spending priorities to grassroots environmental movements. In addition, some civil rights advocates have criticized mainstream environmental organizations for a lack of racial diversity in their composition and for their failure to adopt and implement equity issues in their core objectives and missions. These racial justice critiques are interwoven with broader issues of racial inequality in education, especially in business, law, and science—fields from which mainstream environmental organizations draw heavily for staff and other resources. The broader concern is that while the environment is something that affects all of us, environmentalism has become a

separate political and policy issue, splintering apart from the larger equity movement and stratified by race and class privilege.

Strategies to reduce foreign fossil-fuel dependence are particularly important as oil supplies dwindle and battles across the world are fought over oil and pipeline rights. But it seems sometimes that neither common cause nor common enemies can forge together the many forces needed to stop global warming. Grassroots groups and mainstream environmental groups often clash over their political strategies to reduce pollution. These disagreements can take the form of bitter recriminations over the role of corporate polluters, market-based strategies, and the role of organizing and the grassroots. While mainstream groups seek to bring down overall emissions, some grassroots organizations argue that mainstream groups need to make more targeted efforts toward redistributing polluting sources out of low-income communities. This poses a particularly troubling equity issue: if we successfully lower GHG emissions overall, will some neighborhoods remain just as toxic and hazardous? Who will live there? Will some groups continue to shoulder the burden more than others?

Of particular relevancy to both the climate change debate and the larger environmental movement is the disproportionate placement of power plants in disadvantaged communities. A coal-fired power plant anywhere, emitting CO₂, soot, and toxic levels of mercury all at once, is responsible for hurting all of us. About 50 tons of mercury are emitted into the atmosphere each year as a result of coal-fired power generation.³⁸ Mercury is the most toxic heavy metal in existence.³⁹

Mercury harms children and has been linked to cancer and other illnesses. Coal-fired power plants have a

devastating impact on the health of all communities but disproportionately affect some: 68 percent of African Americans live within 30 miles of a coal-fired power plant, compared to 58 percent of the white population.⁴⁰ Mainstream and environmental justice advocates alike face an extremely powerful coal lobby. Furthermore, in the United States coal remains (without changes in domestic policy) the cheapest, most plentiful source of energy. While oil supplies are in decline, coal supplies worldwide could last for hundreds of years. The United States is estimated to have the largest coal reserves in the world, nearly 27 percent of the global supply.⁴¹ Increasingly, some environmental advocates and business interests are putting considerable resources into research and development of methods to limit or sequester coal-burning emissions. These methods can be controversial and costly, and many other environmental advocates have called into doubt the safety and cleanliness of “clean”(er) coal technology.⁴²

Everybody Wants to Know: Where’s It Going to Go?

The debates about coal and the limits of natural gas have set the stage for the development of renewable energy. Increasingly, controversy around energy independence revolves around a practical determination: where are the alternative energy sources going to go? Many people have turned to natural gas as a source of energy, but natural gas is a limited, expensive resource whose supply has increasingly been called into question.⁴³ And while natural gas power plants do not emit the same level of toxins into the air as coal-fired power plants, the quantity of particulate matter and other toxins they do emit is substantial and dramatically harms the health of those who live near the plants. Grassroots-based community groups, such as Communities for a Better Environment⁴⁴ and the Environmental Health Coalition⁴⁵, have launched strategic campaigns against the continued location of power plants in low-income neighborhoods populated mainly by people of color in the greater Los Angeles and San Diego areas, respectively.

To attain energy independence, many experts agree that the United States will have to exponentially increase its use of renewable energy sources, such as wind, solar, and fuel cells. We have a long way to go: renewable energy sources account for roughly 2 percent of total energy use in the United States.⁴⁶ States such as California are moving ahead with requirements for utility companies to generate renewable energy.⁴⁷ Some states expect to reap a windfall of new jobs and other benefits from the renewable energy sector.

Many people are examining the scale of energy production and distribution. Are there technologies in place that can allow energy to be generated and distributed locally? Clean energy advocates and many social justice advocates are examining the idea of distributed (or distributive) generation, which is the use of small-scale power generation projects, providing localized on-site energy that tends to be inherently community-focused and decentralized. Distributed generation has enormous energy-savings potential. It also has potentially serious implications for the monolithic and large-scale organizations that dominate domestic energy practices. Currently, the United States uses a large, complex, national grid that connects the 48 contiguous states. Texas has its own grid that is connected to the national grid.

To meet GHG-reduction goals, it will be necessary to assess the life-cycle costs of all the possible sources of energy. For example, it would make no sense to use a renewable source of energy if it costs more coal-fired energy to produce the renewable source than this renewable source could replace. For every single renewable and fossil-fuel energy source, we must gather accurate information on the costs and benefits associated with GHG emissions, local community impacts, and environmental quality for each prong of the energy life cycle⁴⁸:

- mining/extraction of resources
- manufacturing of plants/equipments to utilize the energy
- distribution/transmission of the energy
- disposal of waste

The Climate Justice and Environmental Justice Movements

The climate justice movement, like its sister the environmental justice movement, is a grassroots movement of self-determination rooted in a long history of addressing environmental health.⁴⁹ It also seeks to adopt national and international frameworks that address the inequities of mainstream environmentalism. The climate justice movement specifically emphasizes the lesser responsibility that disadvantaged communities have, domestically and internationally, for global warming, in contrast to the unfair burdens of global warming and energy use placed on socially vulnerable communities.

Climate justice and environmental justice have a history of illuminating and criticizing the strategic direction of mainstream environmental organizations which often emphasize technical expertise over grassroots

organizing. Disparities in financial resources and organizational capacity have often been identified as major reasons why mainstream environmental groups are popularly viewed as the leaders in addressing wide-reaching issues such as global warming, while environmental justice advocates are often portrayed as caring only about locally unwanted land uses or “Not in My Backyard” issues.

Another area where there has been some practical differentiation, although not necessarily an ideological one, is between the environmental justice movement and the civil rights movement. Many civil rights organizations have not explicitly adopted environmental justice frameworks for their existing work or specifically funded work on environmental policy issues, concentrating instead on issues such as worker’s rights, education, housing discrimination, public benefits, immigration, and voting rights (all areas which bring environmental justice issues into play). Sometimes, civil rights leaders have not wanted to address local environmental issues that do not seem to affect their larger constituency, and many prominent civil rights groups see environmental justice as a separate, not unified, extension of their programmatic directives or funding imperatives.

Environmental justice organizations have tended to participate in the civil rights movement, but not always as an integral arm of that movement. Many environmental justice leaders are historically rooted in the civil rights movement and make it their primary goal to address race and poverty. But it is true that some environmental justice groups do not possess an equity or civil rights framework and come to environmental justice solely through a local land-use lens. Through coalition-building and the growing importance of regional and place-based organizing, however, the already blurry lines between environmentalists, civil rights advocates, and environmental justice advocates are slowly disappearing.

The increasing attention to global warming and environmental health is prompting all organizations, equity-based, environmental-justice based, and solely environment-based, to take a second look at issues once primarily considered “environmental.” The growing body of global warming science has brought home the point that we share the same sky. It has become more and more difficult to ignore issues of fairness in the United States when we are all confronted with issues of fairness internationally. For example, President Maumoon Abdul Gayoom of Maldives in the Indian Ocean has spoken eloquently that his entire nation is

facing extinction due to anticipated sea-level rise caused by global warming.⁵⁰ The undeniable destructive effect of climate change may have a unifying effect as it forces us all to examine the value of life.

State, local, and regional governments have responded strongly to the relative lack of movement on climate change policy on the federal level. An important step forward for governmental work on climate change can be found in the formation of ICLEI, Local Governments for Sustainability.⁵¹ Founded in 1990 by more than 200 local governments from more than 43 countries, ICLEI has developed an international program, The Cities for Climate Protection Campaign, that provides valuable tools for municipalities tackling climate change. Nearly 300 mayors in the United States, representing more than 49 million Americans, have agreed to meet or surpass the targets for GHG emissions set by the Kyoto Protocol. All of the member cities make a pledge to follow ICLEI’s methodology for addressing climate, including conducting greenhouse gas emissions inventory and developing reduction targets. Unfortunately, many cities characterized by crumbling infrastructure and lower income-levels are unable to make the pledge to reduce GHGs due to a lack of resources. The question of resource allocation for sustainability must be taken into greater account, since such efforts have the potential to improve the quality of life in the most disadvantaged urban and rural communities.

State governments have also stepped up to the plate with different proposals for GHG reduction. In a landmark agreement, California became the first state to pass a cap on statewide GHG emissions, requiring the California Air Resources Board (CARB) to devise and implement a plan to reduce California emissions to 1990 levels by 2020. AB 32, the Global Warming Solutions Act of 2006, is particularly notable because it was the product of intense negotiations between environmental justice advocates and mainstream environmental groups and includes specific language to promote equity. As California grapples with developing a plan to meet the new statewide GHG emissions cap, it remains unclear how successful the State will be at fulfilling AB 32’s mandate to direct benefits to disadvantaged communities and ensure that these communities do not carry a disproportionate share of the costs associated with reducing GHG emissions.

Across the country others states, and advocates, are watching carefully to see how effectively, or ineffectively, California will promote equity while reducing GHG emissions.

Cap and Trade: A Small Glimpse into a Big Debate

In California as well as nationally, the most widely and heatedly debated mechanism to implement economy-wide GHG reductions is a market-based system called cap and trade. Cap and trade sets an initial mandatory cap on pollution trading and then allocates a fixed number of pollution allowances to different polluting entities. These entities are then allowed to save these unused allowances for the future, to flexibly reduce emissions so long as they do not out-spend their overall allowance. Finally, entities would be allowed to trade their allowances on a carbon-trading market.

Proponents of cap and trade highlight the fact that a similar, successful system was designed in the United States for SO₂ emissions; it significantly reduced SO₂ emissions, the leading cause of acid rain. They also note that a market-based system would force positive technological innovations from polluters to meet their caps and benefit society overall. A cap and trade system would create market incentives for polluting sources to curb their GHG emissions so they can sell their carbon credits strategically and as best benefits their business. Many supporters have argued that a United States cap and trade system would benefit from the lessons of the European and Kyoto markets, and that cap and trade is the only politically viable way of achieving large GHG reductions.

Recently, the powerful California environmental justice movement released a strong statement against carbon trading.⁵³ Opponents of cap and trade based throughout the world criticize its application and principles along many lines. Some of the most prominent critiques include underlying equity questions as to who owns the right to pollute⁵⁴ and whether polluters would gain financially from a cap and trade system while the public does not collect adequate financial rewards. Many of cap and trade's harshest critics believe that a carbon cap (alternatively known as a "command and control" system) should be established without any trading. Others point to the failure of the European cap and trade system to successfully curb GHG emissions, as well as to RECLAIM, a heavily criticized cap and trade program in Southern California.⁵⁵ They observe that enforcement failures and difficulties cannot be easily rectified or addressed in the face of powerful oil, coal, and commercial lobbies in the United States. Still others dispute the application of a market-based solution to a social issue. In the alternative, some policymakers propose a carbon tax alongside a cap, or a cap and dividend approach.⁵⁶

Many environmental advocates have argued that cap and trade as a system will effectively limit, if not practically weaken, existing ability to reduce other dangerous air pollutants. They criticize proponents of cap and trade for not prioritizing public health concerns and point to a lack of research or information on the anticipated health impacts in their communities. Other cap and trade opponents view the policy as flawed in its design, but not its conception. Many groups hope that cap and trade will generate infrastructure resources but remain opposed to its current federal and potential state iterations. One of their concerns is the distribution of the pollution allowances/credits: they would prefer to auction the credits, requiring polluters to bid against each other initially. Otherwise, they argue, the credits are "giveaways," giving polluters a right to pollute for free and failing to generate enough revenue to actually invest in clean energy and infrastructure. Current federal proposals have a relatively small number of credits slated for auction—most credits would be awarded, without competitive bidding, to specific polluters.

Carbon dioxide is a pollutant, but while the gas itself is not generally considered toxic to humans, CO₂ sources, as discussed earlier, create many harmful co-pollutants. A recent legal case invalidating a mercury cap and trade system highlights issues that are being debated about a carbon cap and trade system. On February 8, 2008, the U.S. Court of Appeals for the District of Columbia ruled that the Environmental Protection Agency's (EPA) cap and trade program to control mercury was in violation of the Clean Air Act. The Court's holding was based on the EPA's decision to take power plants off the list of hazardous pollution sources and allow them to trade mercury. Environmental groups that supported a cap and trade program on carbon were ethically opposed to cap and trade for mercury because it is such a poisonous substance.

Despite the unified coalition opposing the mercury-trading program, doubts remain as to how a carbon cap and trade program would affect carbon co-pollutants such as smog and particulate matter. There has been limited scientific research and therefore little data as to whether or how currently proposed cap and trade programs would result in the reduction of carbon co-pollutants, an issue of concern for many advocates. Furthermore, some opponents reason that because cap and trade programs are not strict enough to regulate mercury emissions, they are also not strict enough to meaningfully reduce CO₂ emissions to the levels needed to avoid further warming. Proponents respond that carbon cap and trade is the only politically viable, national economy-wide method to bring down emissions. This reply raises the question of what are effective alternatives to carbon trading programs, and can these alternatives unify environmental and equity advocates?

One of the most fundamental equity issues around cap and trade is that while any national or statewide plan to limit GHG emissions is extremely important, most of the people that it would affect simply do not know what it is, much less understand it. Now is the time for people on all sides and from all walks of life to not only understand a debate that will affect them, but to actively participate in that debate. People living in vulnerable communities will make up their minds for themselves. Their voices need to be heard as, in many cases, the health of their communities will be significantly affected by the implementation of a national greenhouse gas reduction program. Cap and trade is a technical policy that lacks popular understanding. Both proponents and opponents

of cap and trade have explained it through concepts that are often overly academic.

Information, as they say, is power. The following websites provide some useful viewpoints on cap and trade (this is by no means an exhaustive or comprehensive list). One of the most powerful forces of inequity is exclusion through ignorance; one way to bring all communities to the table is by providing them useful information on the current local and federal debates on climate change. Getting the full picture on cap and trade and understanding how it will affect the communities we care about can help us make up our minds.

Resources on Cap and Trade

PROS

Environmental Defense Fund
www.edf.org/home.cfm

Natural Resources Defense Council
www.nrdc.org

PEW Center on Global Climate Change
www.pewclimate.org

Union of Concerned Scientists
www.ucsusa.org

CONS

Carbon Tax Center
www.carbontax.org

The Corner House
www.cornerhouse.org.uk

Durban Group for Climate Justice
www.carbontradewatch.org

Environmental Justice Coalition
www.ejmmatters.org

Friends of the Earth
www.foe.org (auction-only viewpoint)



6 Mitigating Global Warming: The Devil is in the Details

Many ecological, social, and economic ills are likely to befall us as global warming occurs. If nothing is done, climate change impacts are expected to be more severe and to advance more quickly. Climate change cannot be pigeonholed as an “environmental” issue separate from other salient justice issues. Equity advocates and those who view themselves as representing the disadvantaged are already paving the way on issues of transportation, housing, jobs, and disaster relief. Why not climate change?

Many equity advocates are already using the climate change agenda not only to reduce greenhouse gases but also to address social ills in these various sectors. We see more and more grassroots coalitions forming around climate change, originating and crafting policy ideas in participatory processes, and responsibly laying out the specific impacts of an environmental policy on the socially vulnerable and disadvantaged.

Is the broad group of advocates addressing climate change taking equity seriously? The amorphous climate change agenda is actually an umbrella that needs to become quantitatively and qualitatively associated with the triple bottom line: good for the poor, good for the pocketbook, and good for the earth. Unfortunately, many policies that purport to address global warming are advanced without strategies targeted to specific socially vulnerable communities. For example, how often do we see reports containing more than a token segment on the impact of an overall land-use policy to address GHG emissions on a specific low-income community?

The good news is that in many regions we are still in the early stages of formulating local, regional, state, and national messages, policies, and regulations

around climate change. California is the only state that has passed a statewide GHG emissions plan, and environmental justice advocates were critical to the passage of AB 32. The key word here is potential. Getting in the game now, equity advocates can strategically utilize or, even better, fashion climate change policies that benefit, incorporate, and highlight their communities. They can ensure that their communities are not passed over by what is ultimately a powerful government reform movement of both the private and public sectors.

Equity advocates must act now to be included in the benefits of climate change policies or risk the opportunity cost of stronger policies, or worse, potential harms. The goal of reducing GHGs will benefit all communities. The bigger and more interesting question is whether our society can be transformed by the sustainability movement. The answer depends on specific policy provisions and the actual rigorous implementation and enforcement of so-called details.

The Long Drive Home: Transportation and Land Use

Growing concern over vehicle GHG emissions is challenging one of our country's most fundamental infrastructure expenditures: roads. In 2004, transportation accounted for nearly 28 percent of United States greenhouse gas emissions, and that number is on the rise compared to other sectors.⁵⁷ In California, the portion of transportation emissions is more than 40 percent.⁵⁸ In many states, including Florida and New Jersey, it is more than 45 percent.⁵⁹

Environmental justice and mainstream environmental groups have worked to address dirty diesel and push for increased funding for clean technologies. Together, they have successfully combated limited funding for public transit, bus, and rail. Both constituencies have a strong interest in limiting further road building. While environmental justice advocates and mainstream environmental advocates are motivated by different priorities in addressing sprawl, both groups ultimately want healthier, more livable communities. The reality of global warming means that both disadvantaged and advantaged communities must get into their cars a lot less often.

The rising price of gas is especially harmful to low-income urban workers and the ever-increasing number of lower-income workers commuting from inner-ring suburbs, outer suburbs, and satellite cities. Low-income workers are hurt by the increasing expenditures they must make on fuel and by land use patterns that result in the lack of affordable housing near job centers. They face the trade-off of paying more for housing located near transit and job centers or living in more affordable housing located further away from job centers and paying more for transportation.⁶⁰ As cars become more and more expensive, low-income communities are direly in need of access to public transit, including bus, vanpools, and rail. Equity advocates all across the country are fighting to contain climate change by battling for more transit, compact development, infill development, reduced sprawl, and smart growth.

Since World War II, land use in the United States has been synonymous with the story of suburban sprawl, urban disinvestment, and residential segregation—and these patterns have largely been fueled by public policies. The Federal Highway Act of 1956 played a large role—creating a vast interstate highway network that paved the way for people and businesses to locate along highways, farther and farther from urban centers. Highways sped up the trend of white, middle-class suburbanization and central city decline that had been facilitated by earlier housing policies. Beginning in the 1930s, the Federal Housing Administration provided insurance for private bank loans, but used explicitly racist underwriting standards that systematically denied these subsidies to communities of color.⁶¹ In the 1970s, fair housing laws and reduced discrimination enabled more middle-class blacks to also move to the suburbs.⁶² As opportunity marched outward, low-income communities of color were increasingly concentrated in disinvested central cities.

American roads were originally conceived as an extensive capillary network, built to convey suburbanites via personal passenger vehicles into—and home from—the cities where jobs were located. In the present day,

we cannot keep building roads without a thoughtful examination of where they lead and how transit funding is affected. Many highways were constructed when the price of gas was relatively low. The United States road lobby is very powerful, but the Highway Trust Fund is broke. On a national level, the federal reauthorization of transportation monies is coming up in 2009, and many equity advocates are monitoring and actively debating the issue of funding.

The mere act of driving a car releases CO₂ into the atmosphere, and it is widely recognized that without reducing the amount of vehicle miles traveled (VMT), transportation costs will continue to increase. Efforts to lower emissions have focused in large part on vehicle efficiency standards, called corporate average fuel economy (CAFE). The current standard for passenger vehicles is 25 miles per gallon, and in December 2007, legislation was enacted to raise that amount to 35 miles per gallon by 2020. The federal CAFE standard has been criticized as not stringent enough, and on the same day that the new federal standards were enacted, California was denied a waiver it had requested two years earlier to implement stricter CAFE standards. California has filed suit, and at least 18 other states (at last count) have joined the suit, to overturn the denial of this waiver so that states can impose stricter fuel economy standards.

One method of lowering VMT that has gained considerable attention *and* puts the spotlight on connecting air quality and transportation is congestion pricing. A market mechanism developed by cities and regions in the United States and abroad, congestion pricing uses financial incentives, or in many cases disincentives, to unclog roads and highways in areas with heavy traffic. Sometimes, congestion relief is sought solely during specific hours of the day. Pricing mechanisms include increased tolls, gas taxes, climate change fees, road pricing, zone/cordon pricing, toll lanes, parking fees, and increasing occupancy requirements on high-occupancy vehicle /carpool lanes.

In 2006, the U.S. Department of Transportation launched the Urban Partnership program which challenged cities to access a total pot of nearly \$1 billion to implement congestion pricing pilot projects.⁶³ Several cities, including Miami, Minneapolis/St. Paul, San Francisco, and Seattle are slated to implement congestion pricing projects through the Urban Partnerships Program. In April 2008, New York City's congestion pricing proposal was effectively terminated when the New York State Assembly declined to vote on government authority needed to implement its project. Chicago and Los Angeles have come forward to pursue an Urban Partnership agreement for the \$354 million originally set aside for New York City.

Whether or not congestion pricing is an equitable policy depends on how it is written and implemented. A key factor in the success of many congestion pricing proposals is the viability of alternative options to driving, such as transit, biking, or walking. While the main impetus of some congestion pricing proposals is to relieve congestion, effective plans can significantly decrease auto emissions as well as direct revenues to much-needed public transportation improvements. In some neighborhoods, congestion pricing proposals may alleviate air quality problems. Cities outside the United States that have implemented congestion pricing, such as London, have reported up to a 20 percent reduction in CO₂ emissions.⁶⁴

Some advocates have criticized congestion pricing as a regressive road tax. Proponents have responded that congestion pricing actually serves low-income people because a high proportion of low-income households use transit, and pricing proposals can provide much needed funding for transit. How will equity advocates shape the process, and how will congestion pricing help or hurt low-income communities? The answers will depend on how equity advocates influence the development and implementation of congestion pricing in its formative stage.

Fuel For Thought: Green Cars

Alternative fuels are a major consideration in reducing transportation-related GHG emissions. The Prius phenomenon, to its credit, has helped generate awareness of alternative fuels. Alternative-fuel commuter buses, including those using compressed natural gas and liquid natural gas, have been in high demand, as they significantly decrease GHG emissions of CO₂ and soot—improving the health of local communities. Diesel trucks can be fitted with catalytic converters to reduce GHG emissions. Many environmental health advocates support tech funding for innovations such as “cold ironing,” which allows ships at port to plug into onshore power. Bunker fuels (used by ships) are among the dirtiest, highest polluting fuel sources and are released everyday into port cities, including the Port of Los Angeles. Trains can also be fitted with emission-capturing bonnets while in the yard while they are in “notch,” idling.

One area of great controversy is bio-fuels. Proponents consider bio-fuels attractive because they may allow people to continue driving just as much as they do now, without polluting as much. Critics, however, have pointed out that high amounts of energy are often needed to produce biofuels. The devastating ecological consequences of bio-fuel production from corn, soybean, and palm are well documented. A particularly

troubling example: forests are being cleared and food crops are being replaced by fuel crops in developing countries to market clean, green bio-diesel in countries located halfway around the world. The political, social, and economic ramifications of the fight for bio-fuel are painfully similar to the fight for oil resources. In the bio-fuel debate, like so many others, the issue of fairness in sustainability is often overlooked.⁶⁵

Not everybody can own a car, much less a Prius, (although many of us want one, and I want to thank Bahram Fazeli of Communities for a Better Environment for suggesting a subsidy program to allow low-income households to purchase a Prius to replace gas-guzzling, old clunkers). Green alternative-fuel vehicles can be as expensive as, or more expensive, than fossil-fuel vehicles. Environmentalists must pay attention to the extent to which fuel standards and alternative fuels also improve the quality of life for socially vulnerable communities.

The Urban Renaissance: Is Smart Growth Really Fair Growth?

Can greater fuel economy and a switch to alternative fuels adequately reduce transportation-related GHGs? A landmark study has found that these two measures alone *cannot* reduce transportation-related emissions enough in the United States to meet the Kyoto target of a 60 to 80 percent reduction of GHG by 2050.⁶⁶ For equity proponents, this is a remarkable turning point in the debate because ultimately it means that we will have to find across-the-board ways to reduce VMT, not just use better cars. In a world without perfect cars, everybody must drive less.

One particularly vibrant area calling attention to transportation and land use as well as climate change is transit oriented development (TOD). This planning and design trend seeks to create compact, mixed-use, pedestrian-oriented communities located around new or existing public transit stations.⁶⁷ Over the past decade or so, there has been tremendous growth in demand for compact housing near transit: between 2000 and 2030, upwards of 9 million additional households will live within a half-mile of transit stations. A variety of groups—transit and smart growth advocates, community-based developers, business leaders, planners, and more—have embraced TOD as a powerful strategy for smart growth, urban revitalization, and creating access and opportunity for low-income residents.

But the synergy between economic, land use, transportation, environmental, housing, and equity goals made possible with TOD is not automatically achieved. Thus far, many projects marketed as TODs do not fundamentally differ from traditional residential

suburban developments. Even fewer TODs attain social equity goals. However, TOD is unconventional, complicated, and expensive to develop, and the demand for housing near transit is expected to exceed the number of homes that can be built in TODs. These trends increase the likelihood that TOD housing will be unaffordable to low-income households. Properties within a five- to ten-minute walk to a transit station already sell for 20 to 25 percent more than comparable properties farther away.⁶⁸ Investments in new or enhanced transit stations in low-income neighborhoods can spark rapid appreciation in the costs of land and housing in the community—leading to gentrification and the displacement of lower-income residents.

While TOD holds a great deal of promise for low-income residents—greater mobility, access to economic opportunities, neighborhood-serving retail, open space, walkability, reduced transportation costs—community engagement and thoughtful policies must be incorporated early in the development process to ensure that TOD benefits current residents and businesses and does not lead to displacement. Ensuring that TODs include—and retain—housing that is affordable to low- and moderate-income households is critical to achieving equitable TODs that become stable, mixed-income neighborhoods.⁶⁹

Although not all TOD advocates focus on these equity concerns, increasing numbers of them do. At the same time more and more equity advocates have sought to make sure that TOD contributes to their vision for healthy, sustainable neighborhoods. Coalitions and partnerships in the Bay Area, Boston, Portland, Seattle, and elsewhere have come together to advocate for equitable TOD in their regions. They have used a variety of strategies, including engaging in station area and other TOD planning processes, developing or co-developing the TOD, securing community benefits agreements, and commercial stabilization. In addition, a number of states, regions, and cities have developed innovative land use and housing policies to support mixed-income TOD.⁷⁰

In Denver, for example, the Front Range Economic Strategy Center (FRESC)⁷¹ and the Denver Area Labor Federation organized the Campaign for Responsible Development, a coalition of community groups, labor unions, faith-based groups, and local residents, to ensure that the redevelopment of the former Gates Rubber Factory around a major light rail transfer station generated tangible benefits for working families. This remarkable coalition worked to put stronger environmental standards in place for the remediation of a contaminated brownfield⁷² created by the rubber factory, provide access to transit for low- and middle-income families and children, and secure a strong

community benefits agreement (CBA) focused around affordable housing, living wage jobs, and local hiring. Key CBA provisions included: an affordable housing set-aside of 10 percent of for-sale units and 20 percent of rental units; the exclusion of big-box grocery stores that pay low wages; and the extension of the prevailing wage to privately-funded infrastructure construction jobs and parking and security personnel.⁷³ Their campaign is continuing as they seek to use the TOD concept to redistribute resources and access to all.

Transportation infrastructure, be it roads or transit, is expensive and requires resources as well as attention to national, state, regional, and local policy. Ultimately, it can be a significant source of leverage for the equity community to argue that addressing global warming *demands* comprehensive solutions. In the long run, despite improving fuel-economy standards and the advent of exciting new technologies, it will cost more to continue building roads than it will to support community transportation and land-use trends such as “smart growth” (which aims, in part, to create livable communities by decreasing the distance between people’s homes, jobs, and recreational and shopping areas).

Is reducing VMT good news or bad news for all Americans? Again, it depends on whether equity proponents make themselves heard. Like so many sustainability agendas being pushed forward as a response to global warming, the rising price of fuel means that more people want to take public transit. More people want the economic and health benefits of shorter commutes. There has been renewed interest in revitalizing urban communities, but most Americans continue to live in suburbs while African Americans and, increasingly, Latinos remain concentrated in the poorest urban areas. Continued local policies encouraging smart growth attached to GHG reductions will likely change these statistics. But will they make structural improvements, or will they simply whisk up poor neighborhoods like Dorothy’s house in Kansas—dropping them off untouched, in an unfamiliar suburb?

Smart growth does not automatically include or benefit low-income communities and communities of color. Without specific strategies to prevent displacement and ensure affordability, investments in urban areas will generate renewed interest and demand, which can lead to gentrification, displacing disadvantaged groups and pushing socially vulnerable people out of desirable locations.

Many social scientists have documented the effect of urban revitalization and suburban growth on poor communities of color.⁷⁴ In search of affordable homes, poor households, predominantly composed of people

of color in some regions, must relocate to inner-ring suburbs where the white population has departed. This phenomenon leaves them trapped in a situation similar to that found in the inner city: a population with a smaller tax base and less infrastructure. The last thing that we want to see is a smart growth agenda that populates a revitalized urban core with wealthier people, while lower-income white people and people of color are forced farther and farther out to the suburbs.

Robert Bullard, Professor of Sociology and Director of the Environmental Justice Resource Center at Clark Atlanta University, has written about the devastation of sprawl and racial inequality in the Atlanta region and how advocates have responded to encourage more equitable regional development.⁷⁵ There, the first-ring suburbs have become extensions of the inner city. Many successful coalitions have worked from the community development, environmental, equity, faith-based, and labor perspectives in Atlanta to engage in the problems posed by sprawl and the removal of jobs from the urban core.⁷⁶ These coalitions have demanded increased

transit access and infrastructure improvements, argued for moratoriums on road spending, and looked to regionalism as one framework to organize communities around the sprawl issue that affects them all.

On a practical level, it would make very little sense to enact policies forcing low-income individuals to drive less if that is the only way they can get to their jobs. The alternative is to demand true affordability in transit-accessible locations and policies that incorporate long-term mixed-income communities. Groups such as the Bus Riders Union in Los Angeles have consistently criticized the funding of rail accompanied by relative decreases in the funding of bus services that remain the major viable source of transit for low-income communities of color in Los Angeles.⁷⁷

If wealthier people repopulate cities, would a more privileged group still drive as much, maintaining their current GHG emissions levels or, worse, increasing them? Would the displacement of low-income families to first-ring and outer suburbs increase GHG emissions? Will

Resources on Transportation and Land Use:

Bus Riders Union

www.busridersunion.org/engli/index.html

The Center for Neighborhood Technology

www.cnt.org

Environmental Defense Fund

www.edf.org/home.cfm

Environmental Justice Resource Center (EJRC)

www.ejrc.cau.edu/programs.htm

Georgia Stand-Up

www.gastandup.org/

Livable Places

www.livableplaces.org/

Local Initiatives Support Coalition

www.lisc.org

Massachusetts Smart Growth Alliance

www.ma-smartgrowth.org

Miami Workers Center

www.miamiworkerscenter.org

Ohio Smart Growth

www.ecocitycleveland.org/smartgrowth/sgagenda/agenda.html

Partnership for Working Families

www.communitybenefits.org

PolicyLink

www.policylink.org/EDTK/TOD/

Pratt Center for Community Development

prattcenter.net

Reconnecting America

www.reconnectingamerica.org

Right to the City

www.righttothecity.org

Smart Growth America

www.smartgrowthamerica.org

Transportation and Land Use Coalition

www.transcoalition.org

Transportation and Land Use Collaborative of Southern California

www.tluc.net

Urban Habitat

urbanhabitat.org

Urban Land Institute

www.uli.org//AM/Template.cfm?Section=Home

US Green Building Council

www.usgbc.org

the result be more miles driven on widening highways by unreliable, gas-guzzling cars?

Climate change continues to place attention on policies that affect the built environment. Global warming policy agendas promote less reliance on cars and roads, more transit, less sprawl, and the location of jobs closer to homes—all of which have profound impacts on issues of race and class in America. Individual cities are developing policies to meet GHG emission goals that invariably will have impacts and put restrictions on transportation and land use. For equity to be considered, we must ensure that all transportation studies and policies specifically state their impacts on the triple bottom line: equity, economics, and the environment.

Huffing and Puffing Should Not Blow Our House Down

The residential housing sector contributes nearly 17 percent of greenhouse emissions in the United States,⁷⁸ and roughly 70 percent of residential GHG emissions are from electricity consumption for lighting, heating, and cooling.⁷⁹ Utility costs have only increased over time, and as the climate change agenda prompts greater use of renewable energy and adoption of energy conservation practices, this trend is projected to drive up energy prices further. *In short, failing to become energy efficient will become more and more expensive for everybody, and increased energy prices will disproportionately harm middle and low-income families, people of color, and people living in poverty.* These same socially vulnerable groups are also the least able to adapt to increasing energy prices without the assistance of socially conscious energy pricing, government subsidies, and sustainable housing policies.

Nationally, nearly 85 percent of low- to moderate-income workers drive cars to work, except in some metro areas with extensive bus and rail systems.⁸⁰ As mentioned above, many working families in search of affordable housing must move far away from their jobs to save money in housing. These same families then experience increased transportation costs and see nothing in terms of savings. Transportation and housing costs should be considered together to provide a fuller, more accurate picture of how low-income families are affected by land use patterns and their housing choices.⁸¹

Housing availability, both rental units and home ownership, has always been a fundamental issue of fairness for low-income urban and inner-ring suburban working families. Available and affordable housing in the United States is marked by both economic and racial inequity. Historically, under-resourced communities have been the victims of predatory and discriminatory lending, urban abandonment, and neglect. Low-income

working families spend an average of 57 percent of their household income on housing and transportation costs, exacerbating their already-difficult economic positions.⁸² African American and Latino families are disproportionately burdened by high combined housing and transportation costs compared to white families.⁸³

Energy efficiency of housing is also an equity issue. African Americans expend nearly 20 percent less carbon dioxide than whites per household, yet will be one of the groups most harmed by high energy costs.⁸⁴ Equity advocates are working to ensure that low-income communities of color are included in the sustainable building movement, but to a certain extent, they are playing catch-up to an already burgeoning sustainability movement.

Perhaps one of the most powerful indicators that the climate change agenda is moving forward is the increasing use of the Leadership in Energy and Environmental Design (LEED)⁸⁵ standard, which is applied to buildings that fit sustainable green building and development practices. Essentially, the LEED stamp certifies a building is safe, eco-friendly, and energy efficient. The U.S. Green Building Council, which runs the LEED system, is also developing a neighborhood standard incorporating smart growth principles.

Equity groups must vigilantly monitor housing standards that affect the quality of life. In contrast to better building standards, many equity advocates have championed flat subsidies for utility bills for families who live in affordable housing. These subsidies are often necessary, and in some ways, they more powerfully and directly address the rising cost of living for low-income families. Applying energy-efficient building standards to low-income homes will take some time and investment resources, but it has already begun in important ways.

The case is being made in the housing sector that sustainable building is a democratic principle that must be applied equally to the poor and the rich.⁸⁶ Enterprise Community Partners, a national community development intermediary, has developed the Green Communities Initiative, which, similar to the LEED standard, incorporates sustainability principles into constructing affordable housing.⁸⁷ Sustainable housing means greater energy efficiency and lower utility bills. It means intelligent passive construction that takes into account climate and the local environment.⁸⁸ It means access to renewable energies such as solar, wind, geothermal, and distributed generation. It includes storm-water capture and filtration, natural and native landscaping, and irrigation. Sustainability principles mandate the use of high-quality, non-toxic, safe building materials. Certainly, it follows the goal of healthy homes for healthy people. But the question on many minds is does it mean more expensive homes?

Like so many aspects of the climate change agenda, green building can be affordable depending on which policies are implemented, and how. A report, by New Ecology, Inc. and the Tellus Institute, found that financial benefits accrued over time for green affordable housing.⁸⁹ Two main factors leading to a positive balance sheet for affordable housing developers were their experience and expertise in affordable green building and the amount of time they planned to hold or manage the project. A third, perhaps less significant, factor was government subsidies and other financial incentives. Residents of green housing gain qualitative benefits such as a greater sense of pride in their housing, and improved health and comfort.

Advocates for affordable housing and public housing (government-owned housing available only to low-income renters) are promoting federal and state policies that link public subsidies with energy efficiency, location efficiency, and green technologies. Cutting energy costs just 5 percent over five years would save the U.S. Department of Housing and Urban Development an estimated \$1 billion.⁹⁰ Affordable housing is often already “location efficient”: centrally located in densely developed areas, often supported by transit and strategic targets for equitable transit oriented development. Despite all the possibilities associated with affordable housing and reducing GHG emissions, many environmentalists have not given the issue of greening this housing stock enough attention.

On the other hand, some developers have argued that green standards should not be required for affordable developments, as the financial viability of these projects is already threatened. Sustainable building can create more regulatory hassles, they assert, and it would drive up prices and discourage development. With Hope VI public housing revitalization reauthorization coming up in Congress, equity advocates are fighting to simply preserve the existing stock of affordable housing, and it remains to be seen how sustainable building trends will impact this struggle. Legislative mandates which have yet to be determined will ultimately drive forward or slow down a green movement for both upgrading existing affordable housing and building new, green affordable housing.

The true impacts of GHG emissions from affordable housing or public housing have yet to be fully studied, but there is certainly an opportunity for coalition-building among fair housing advocates, environmentalists, and other equity advocates. Many states have begun to utilize LEED standards as scoring criteria for low income housing tax credit applications (utilized by private sector developers of affordable rental housing), incentivizing developers to include these practices. Environmental and housing advocates have worked together in California, Oregon, Massachusetts, and post-Katrina Louisiana to prioritize these developments.

One area garnering attention for its linkages to climate change, housing, and economic development is the focus on new buildings versus old buildings. Much of the sustainable building movement has centered on new construction. However, existing housing stock, especially affordable units, is direly in need of reinvestment.⁹¹ Millions of low-income housing units could drastically benefit from energy-efficient retrofitting.

Equity advocates have much to worry about with laws that stimulate sustainable building. While these laws are laudable, the benefits frequently do not accrue to poor families, exacerbating existing inequities. For example, California's groundbreaking solar initiative, which gives large tax incentives for solar installation, bringing down the expensive capital costs of solar, benefits businesses and wealthier homeowners, but it does relatively little to make solar affordable for lower-income home owners. At the time of this writing, the California Public Utilities Commission is implementing a \$108 million program providing incentives for installing solar panels to low-income, single family homes. Given the high cost of solar installation overall, it is questionable whether these programs can attain the scale needed to lower overall energy costs and dependence on fossil fuel.

Most new technology in home energy conservation is accessible only to wealthier families and businesses. All in all, few sustained government policies make these technologies more attainable to less wealthy families. Lower-income families with less energy-efficient homes may not be able to afford a society that mandates energy efficiency without considering their plight. The City of Berkeley has tried to address this dynamic by providing upfront grants to homeowners to do solar retrofitting and to amortize repayment over 30 years through property taxes. This allows lower-income families to pay back expenses while realizing energy savings.

Without these types of policy interventions, energy conservation could become energy starvation for those who already have less. Creating and retaining affordable housing is already a struggle for the equity community. A purely environmental agenda necessarily involves greater energy efficiency across all households to reduce energy consumption, but it should also take into account the fact that wealthier households also consume more energy. One proposal before the California legislature would end mortgage interest tax deductions for homes over 3000 square- feet as an incentive to build smaller, more energy-efficient houses.

In an effort to increase energy conservation, policy mechanisms will make it more costly to emit GHGs by leaving the lights on. Consider this: those who can afford the cash outlay to buy a compact fluorescent bulb can actually leave the light on for longer, while paying less. A

household in poverty, stuck with traditional incandescent light bulbs and spikes in utility costs, may not be able to turn the lights on for large blocks of time so that they can afford their next meal or health care for their kids. These disparities exist and unfair resource gaps will likely widen with rising prices on energy and pressures to limit GHGs.

While GHG reductions could benefit low-income communities, in terms of increased environmental health, there is a distribution question as to who must shift or lower their energy-use patterns the most. This task should not fall squarely upon those who have emitted the least GHGs. Now is the time to ensure that the burden of increasing housing and transportation costs is not borne unfairly by low-income households. Equity advocates must be at the table to ensure that sustainable building is democratically applied.

Resources on Housing:

(most of the groups listed in transportation and land use can also provide information and resources on housing):

Center for Housing Policy
www.nhc.org/housing/chp-index

Enterprise Community Partners
www.enterprisecommunity.org

Gary Goldblum, AIA Architect
www.greenworkstudio.com

Global Green
www.globalgreen.org

Jonathan Rose, Architect
www.rose-network.com

National Low Income Housing Coalition
www.nlihc.org/template/index.cfm

US Green Building Council
www.usgbc.org

Green Economy: More Jobs for Everyone?

The rise in public attention to global warming, renewable energy, environmental health, sustainable building, renewable fuels, and increased public transportation options has also accompanied an increasing hope that more “green-collar” jobs in these growing industries will become available for everyone. Coalitions that include labor, civil rights activists, business, community organizations, environmental groups, policy organizations, as well as politicians, have capitalized on this policy arena. It is a natural meeting ground for these entities. While there is an increasing public interest in the economic potential for the creation of new climate-friendly jobs and the replacement of others, the specifics of which green-collar jobs are available, where they are located, and who will have them, have yet to be determined. In this arena, equity advocates are not just at the table, but they are actually setting the table by launching organizations and acting as key coalition partners.

Founded in the fall of 2007, Green for All⁹² is led by Van Jones with the Ella Baker Center for Human Rights and Majora Carter of Sustainable South Bronx. Green for All embraces green jobs formation and job training as a tool to address poverty, pollution, and disadvantaged communities. Green for All tackles racial inequality directly and its founder, Van Jones, has called for a green “New Deal” coalition. Another group that works specifically in this area is the Apollo Alliance⁹³, a national umbrella organization formed by state and local chapters in 2004 to advocate for clean energy and infrastructure improvements leading to increased jobs and employment. The Blue Green Alliance⁹⁴, launched in 2006 as a partnership between the Sierra Club and the United Steelworkers, concentrates its efforts in six states (Michigan, Ohio, Minnesota, Pennsylvania, Washington, and Wisconsin) and similarly focuses on economic development around clean energy, fair trade, and environmental health and toxics.

In December of 2007, President Bush signed the Energy Independence and Security Act. It has yet to be funded, but most advocates hail it as a significant step toward a clean energy economy. Some of the bill’s highlights include requiring higher fuel- economy standards and stimulating American automobile makers to make more efficient vehicles and alternative-fuel vehicles; setting new energy-efficiency standards and offering incentives for commercial and federal buildings; and job training programs. Still to come are the appropriation battles over the provisions of the act, as well as decisions about how cities and states will implement or develop their own laws and policies in response to the new law.

Green jobs are particularly important for areas that have faced extensive job loss in manufacturing and industrial sectors. For example, large and small older industrial cities have suffered severe economic and population declines, most notably in regards to a struggling automobile industry. The “Rust Belt” commonly connotes the region of the Northeast and Midwest that once housed heavy industry: Illinois, Indiana, Michigan, Ohio, and Pennsylvania are usually included, as well as eastern Wisconsin, Buffalo, New York, and northern West Virginia.

What will be widely regarded as the primary job-generating vehicle of the renewable energy industry/green manufacturing? No particular sector has been ordained the successor to the automobile industry. It would be highly impractical for locations that do not already contain industrial land uses (or at least an already built, manufacturing infrastructure, even if it is decaying) to build up a green industry from the ground. Therefore, some green job proponents are looking at green manufacturing jobs as potentially replacing manufacturing jobs lost in the past two decades, particularly in places like the Rust Belt.

Green for All and other equity groups are especially focused on job ladders, or career pathways out of poverty. Workforce development would require strategic job training programs. Skills these workers acquire can be viewed as “green steps” leading to professional flexibility, rather than just ending with “green jobs.” For example, those who learn to retrofit buildings are joining the construction industry. Young women and men who install solar panels will learn the skills of electricians, specializing in photovoltaics. Unions such as the International Brotherhood of Electrical Workers and the Steelworkers can assist in ensuring job security and other important benefits and negotiating wage issues for these jobs. Good policy can establish such job training programs, but who will ensure good policy that is successfully implemented?

Many local grassroots community groups are paving the way through social entrepreneurship. One example is the Verde group in Portland, Oregon, which created a native plant nursery business. These groups serve an important function by not only employing workers from depressed areas in sustainable jobs such as landscaping,

solar installation, and carpentry, but also by building the capacity of low-income communities of color to connect with the sustainability movement and reap both the job benefits and the quality of life benefits. Green jobs have the potential to educate, to inspire, and to foster great pride for a healthy, living planet.

Connecting communities to jobs is critical to green workforce development. How will people get to the jobs? Jobs must be located in areas that are accessible to public transit, given the rising fuel and housing costs discussed earlier. Public transit must run to these areas frequently and reliably, around the clock. If jobs are not co-located with the existing transportation infrastructure, growth patterns could ultimately diminish the quality of life for already disadvantaged communities. Legislative incentives are necessary to develop green jobs in transit-accessible areas.

Another issue of controversy is whether a greener economy will replace existing jobs or create new ones. Here the area of retrofitting presents a significant intersection between green building for low- and moderate-income households and economic development. It can be argued that simply building sustainably does not create more jobs since constructions jobs already exist. However, current affordable housing stock, as discussed earlier, is sorely in need of attention. Many older buildings and homes, especially those constructed in the 1950’s and 1960’s, are particularly poor in energy efficiency. Commercial buildings with older HVAC systems, for instance, need retrofits. Economic stimulus packages that increase the incentives and affordability of retrofits are particularly valuable, as retrofits would create new jobs, beyond existing ones.⁹⁵

The advancement of the green collar agenda is inextricably intertwined with the other areas discussed earlier, such as transportation, land use, and housing. In particular, it is tied up with the movement for energy independence and the decisions that have yet to be made. Which renewable energy sources will be implemented by different states and localities? How clean will United States energy production become? A green economy is a chance to improve the lives of low-income people, but these jobs must, in the end, be sustainable.

Resources on Green Jobs:

Apollo Alliance

www.apolloalliance.org

Blue Green Alliance

www.bluegreenalliance.org

Center on Wisconsin Strategy (COWS)

www.cows.org

Green for All

www.greenforall.org

Miami Workers Center

www.miamiworkerscenter.org

National Hispanic Environmental Council

www.nheec.org

Training & Policy Education (formerly CIPHER)

www.scopela.org/cipher/index.html

Sustainable South Bronx

www.ssbx.org

Verde

www.verdenw.org

Coming Back from Disaster: The Energy of New Orleans

In the aftermath of Hurricanes Katrina and Rita and their terrible wrath upon communities across the Gulf Coast, many people understood the devastation as a wake-up call to the disasters of climate change. They viewed the hurricanes as precursors of mightier storms to come—climate change is forecasted to increase the strength and intensity of hurricanes. When the hurricanes hit in 2005, more than 1,500 people died in New Orleans alone. There is no doubt that better disaster management practices will be needed to respond to the impacts of climate change, including increased flooding, drought, wildfires, and stronger hurricanes. The destruction wrought by these storms reveals how the interaction of forces laid out in the previous chapters—energy use, environmental degradation, climate change and financial vulnerability—puts low-income communities of color at greatest risk.⁹⁶

The people of Louisiana and New Orleans are inspirational leaders, tackling both the mitigation and adaptation sides of failed environmental protections—but they continue to need further assistance. The Katrina disaster is a story of environmental injustice, demonstrating both that the socially vulnerable have the least ability to adapt to climate change, but also that they have the capacity to lead us all in the struggle to cope with global warming.

Many people in New Orleans do not refer to the destruction following Hurricane Katrina as “Katrina” or the “storm,” but instead they refer to it as “when the levees broke.” While the Army Corps of Engineers had invested nearly \$1.9 billion⁹⁷ in flood control infrastructure for the five years before the 2005 disaster, the breaking of several levees when Hurricane Katrina hit ultimately resulted in most of the flooding that destroyed vast areas of New Orleans. The failure of the levees has been a source of much investigation, and apparently the Corps knew before the flood hit that the floodwalls would fail in much the same manner as they actually did on August 29, 2005.⁹⁸

A significant amount of wetland, including marshes and barrier islands, has disappeared in Louisiana since about 1930. Much of the wetland loss is attributed to the construction of the levees, as well as to oil drilling in the Gulf and to dam construction along the Mississippi River that prevents sediment from reaching the delta. These factors contributed to the destruction of vegetation and the erosion of the wetlands. Wetlands are an important storm buffer, and miles of wetlands used to stand between New Orleans and severe coastal weather. Over time, global warming has caused and will cause rising sea levels, which will further erode Louisiana wetlands, removing even more protection against future storms.

More than 50 percent of New Orleans’ African American population was displaced—the largest number of any group. While many African American families are slowly returning, they have had a more difficult journey than wealthier white families—from experiencing neighborhood closure and long periods without utilities in places such as the Lower Ninth Ward, to having fewer assets with which to rebuild their lives, in part because they have lower property values for similar-sized homes compared to white families.⁹⁹ Before the storm, 42 percent of African Americans owned their own homes; many of these homes had been passed down from generation to generation.¹⁰⁰ Like most older buildings in New Orleans, these homes were constructed to allow air to pass through and cool the house (known as “leaky” or “airy” architecture). As summers became even warmer and more unbearable, however, many families installed small air conditioning units. Since their homes

were not airtight, they were also not energy efficient. These same families could not afford retrofits, so their attempts to cool down ended up raising their utility bills significantly.¹⁰¹

Nearly 83 percent of these same African American homeowners were employed full-time in low-paid service-sector jobs.¹⁰² For those who owned homes, their property was assessed at a very low value after the flood—in part because many were older and not energy efficient. Returning families were not able to purchase new homes or to replace their old ones by rebuilding or renovating what was left. Additionally, many families did not have the income to purchase flood insurance. Flood insurance requirements were actually a deceptive factor contributing to displacement, since many homes were technically constructed behind the allegedly sound levees—so they were not required by law to be insured.

In New Orleans, where more than half the residents lived in rental homes pre-Katrina, and more than half the destroyed housing were rentals, affordable rental housing is still extremely limited. Even habitable public housing—99 percent of which is occupied by African Americans—has been demolished post-Katrina, leaving many residents without any home. Some communities, such as the Vietnamese community in New Orleans East, were able to mobilize collective community resources. Ninety-five percent of the Vietnamese community has returned due to strong leaders who organized them in spite of little government support.¹⁰³ But they have had to continually resist environmental hazards—from landfills being established in their communities as post-storm dumps, to long-term stays in environmentally unsafe FEMA trailers. Meanwhile, Vietnamese residents continue to struggle to win the affordable housing subsidies they need for their planned affordable housing developments.

The return of increasing numbers of African American and Vietnamese residents is a critical part of the recovery of New Orleans, replacing an economic backbone and returning the rich cultural history of the city that was eroded by the floods. A new influx of Caribbean and Latino workers in the construction industries are fighting to get paid wages that are owed them in a rapidly growing and unlicensed contracting market.

Homeowners are dealing with a particularly difficult and complex situation in the insurance industry. Many insurers are contesting claims for wind damage after Katrina, since many residents did not have flood insurance. Others are refusing to write policies going forward. Everyone has seen huge jumps in insurance costs, placing great hardship on lower income families. What is the future for homeowner and disaster insurance? Climate change makes weather prediction

particularly difficult, which affects the ability of insurance companies to assess risk and rely on historical models.¹⁰⁴ Insurance companies are also heavily regulated; government requirements for flood insurance and the prices of those policies can be influenced by New Orleans residents. Others have argued that keeping insurers in the market at all threatens rebuilding efforts. Stronger environmental protections can help address the risks to both residents and the insurance industry over time.

Grassroots groups are beginning to organize for reform of the Army Corps as well as the insurance industry under the umbrella of “levee justice.”¹⁰⁵ Ironically, the charge of the Army Corps of Engineers to build the levees that failed during Katrina came from the Flood Control Act of 1928 and subsequent flood control laws.¹⁰⁶ This act followed the Great Flood of 1927, which originated when the Mississippi River broke through levees and hit Arkansas, Mississippi, Kentucky, Illinois, Tennessee, as well as Louisiana.¹⁰⁷ More than 200 people perished in the flood¹⁰⁸, and the property damage was extreme. Over 700,000 people were displaced. More than half of them were African American, and many of these climate refugees were subsequently forced to labor in slavery-like conditions on flood relief efforts and levy construction. There are disturbing links between the aftermath of the Great Flood of 1927 and the Flood Control Act of 1928.

The breaking of the levees and the increasing severity of hurricanes has re-ignited grassroots groups all over Louisiana who were and are fighting for the state to be accountable for its climate change contribution. The mayor of New Orleans has adopted a Green NOLA plan to address GHG emissions in the city and combat over-reliance on fossil fuels. New Orleans has been designated one of 13 solar cities in the country, due to work by groups such as Green Coast Enterprises¹⁰⁹, which is also modeling viable sustainable building for homes in New Orleans. Association of Community Organizations for Reform Now (ACORN) has won a successful campaign to shift levee resources to equally protect Orleans parish African American neighborhoods as their cross-levee neighbors in Jefferson parish.

Louisiana is also the location of a large number of coal-fired power plants and has many still unrecovered coal resources. The principal power supplier in New Orleans at the time of the flood was Entergy New Orleans, a privately held subsidiary of Entergy Corporation, a Fortune 500 company. After the flood, many natural gas lines were badly damaged, cracking from the pressure and weight of the water (much of the city remained flooded for two weeks after the storm first hit). Entergy New Orleans declared bankruptcy, and subsequently ratepayers have had to bear increased

costs to help restore the company. The Alliance for Affordable Energy¹¹⁰, a resident-based watchdog group in New Orleans, has been advocating for energy-efficient building practices for low-income residents all over the city, fighting rate increases, and generally promoting responsible energy use and energy independence.

Entergy Louisiana Limited (ELL), another subsidiary of the Entergy Corporation, and two other separately owned power plants in other areas of Louisiana, are all beginning to convert from natural gas power plants to coal-fired power plants. Not only do coal-fired power plants produce greater amounts of CO₂ than natural gas power plants, they also emit substantial levels of particulate matter and mercury, as discussed earlier. ELL's petition to convert its plant in LaPlace, Louisiana, was approved last year by the Louisiana Public Service Commission, and is being appealed by a concerned coalition of Louisiana groups, including the Alliance. These plants will all contribute to the national electrical grid. In essence, New Orleans residents will be supplied more energy through coal-fired plants, which flies in the face of their experience in the hands of an angry atmosphere.

New Orleans residents are rallying around issues of climate justice, recognizing that with the displacement of their African American community, once again, those

who contributed least to energy waste are also affected by it the most. Particularly inspiring is the story of the Lower Ninth Ward Center for Sustainable Engagement and Development.¹¹¹ Led by a dynamic African American leader, Pam Dashiell of the Holy Cross Neighborhood Association, this neighborhood was almost completely emptied out by the flood. Dashiell and other community leaders held meetings even when their entire neighborhood had been vacated, seeking out the new diaspora of their community across the United States. They soon declared themselves to be a "carbon neutral" neighborhood and initiated a climate change agenda. Without houses to shelter them while they organize, they are nonetheless raising an agenda for sustainable building and greater energy efficiency.

The work of New Orleans residents in reclaiming their lives from the devastation of the Katrina tragedy emphasizes the level of their environmental consciousness and the movement-based environmental frameworks that are shaping their healing. Their roads, energy supply, and homes were all destroyed by the flooding. Therefore, more assistance is needed by New Orleans. Not only do our inspired neighbors need meaningful government assistance, they also need the continued financial and technical assistance of environmental and social justice advocates who care about setting things right.



Resources on New Orleans:

Advocates for Environmental Human Rights

www.ehumanrights.org

Alliance for Affordable Energy

www.all4energy.org

Deep South Center for Environmental Justice

www.dscej.org

Green Coast Enterprises

greencoastenterprises.com

Gulf Restoration Network

www.healthygulf.org

FutureProof

www.futureproofnola.com

Lower Ninth Ward for Sustainable Engagement and Development

www.makeitrightnola.org/mir_SUB.php?section=low9&page=comm

PolicyLink

www.policylink.org

Global Green

www.globalgreen.org/programs/neworleans/index.html

Further information:

Boalt Hall School of Law, Research Guides, Disasters and the Law: Katrina and Beyond

128.32.29.133/disasters.php

Russell Sage Foundation: In the Wake of the Storm: Environment, Disaster and Race After Katrina

www.russellsage.org/publications/Reports/080227.488787

Miners often carried a canary into the mine alongside them. The canary's more fragile respiratory system would cause it to collapse from noxious gases long before humans were affected, thus alerting the miners to danger. The canary's distress signaled that it was time to get out of the mine because the air was becoming too poisonous to breathe. Those who are racially marginalized are like the miner's canary: their distress is the first sign of a danger that threatens us all.

-Lani Guinier and Gerald Torres,
*The Miner's Canary: Enlisting Race,
Resisting Power, Transforming
Democracy*, 2002



7 Conclusion

A long time ago, in a packed auditorium, I heard Lani Guinier speak about race and power in America. She argued persuasively for cross-racial, grassroots coalition-building efforts to remedy racial injustice and to eventually build a truly participatory democracy. She described a social justice movement in which people of all races felt empowered to effect change. Mainstream environmental groups in the United States have already done a laudable job of making it known, in no uncertain terms, that global warming is real. It is a growing threat to human beings—it is not a scary fairy tale. The environmental justice movement has already achieved the important goal of making race and class visible in the mainstream environmental movement. It is up to all of us to build meaningful partnerships between all races and income groups moving forward, and one of the first steps is disseminating reliable information to everybody.

Whether we choose to deal with climate change in terms of environmental health, energy conservation, transportation, land use, housing, a green economy, adaptation or mitigation, science, organizing, policy, or law—we need to recognize that there is a tremendous gap to be filled between where our current policies are and where they need to be for us to effectively deal with the consequences of global warming and to prevent our world from getting any warmer. Global warming may be getting a great deal of new attention, but it is not a new issue. We all live under the same sky. In the end, we all breathe the same air. We always have. What is done by

one community in one place may seem small. Yet it can change the entire world.¹¹² Therefore, we cannot defeat the problem of global warming alone.

Perhaps the most devastating myth about climate change is that it is not everybody's issue. I hope that the examples I have chosen will in some way touch upon your work. Whether your interests revolve primarily around polar bears or around people, global warming has the enormous potential of bringing us all together to address its impacts on fairness and quality of life. The groups listed in this piece can serve as resources for those of us just starting to explore climate change. If they do not have the answers you want, then perhaps we can learn new ways together.

The issues of environment, energy, housing, land use, transportation, economy, mitigation, and adaptation are all dynamic and interactive, just like the atmospheric system. Whether or not we want to believe it, global warming is already here. While we have not yet reached a general consensus on global warming, all people are affected by both the problems and the solutions associated with climate change. If we do not act together soon to reduce GHG emissions by 60 to 80 percent before 2050, scientists have issued a clear, unequivocal warning that we will all face severe consequences. None of us wants to end up like the proverbial frogs in a boiling pot.

Interview List

1. Aaron Lehmer, Green for All
2. Angela Flores, Enterprise Community Partners
3. Angela Harris, UC Berkeley School of Law
4. Annie Finkenbinder, Reconnecting America, Center for Transit-Oriented Development
5. Bill Gallegos, Communities for a Better Environment
6. Bob Allen, Urban Habitat
7. Bob Bullard, Environmental Justice Resource Center
8. Danilo Pelletiere, National Low Income Housing Coalition
9. Elizabeth Bent, San Francisco County Transportation Authority
10. Gene Krebs, Greater Ohio
11. Janea Scott, Environmental Defense Fund
12. Jennifer Tran, USC, Center for Sustainable Cities
13. Jerilyn Lopez Mendoza, Environmental Defense Fund
14. Joan Byron, Pratt Center
15. John McIlwain, Urban Land Institute
16. Jose Carmona, Center for Energy Efficiency and Renewable Technologies
17. Julie Seward, Local Initiatives Support Corporation
18. Juliet Ellis, Urban Habitat
19. Karen Wimpelberg, Alliance for Affordable Energy
20. Kate Rube, Smart Growth America
21. Leo Miras, Environmental Health Coalition
22. Leslie Fields, Sierra Club
23. Leslie Lowe, Interfaith Center on Corporate Responsibility
24. Leslie Moody, Partnership for Working Families
25. Manuel Pastor, USC, Center for Sustainable Cities
26. Martha Matsuoka, UEPI, Occidental College
27. Michael Replogle, Environmental Defense Fund
28. Millie Buchanan, Noyes Foundation
29. Nathalie Walker, Advocates for Environmental Human Rights
30. Peggy Shepard, WE ACT
31. Prisca Weems, FutureProof Sustainable Design Consultancy
32. Ramon Alvarez, Environmental Defense Fund
33. Rhonda Ortiz, USC, Center for Sustainable Cities
34. Sam Zimmerman, Reconnecting America
35. Sarah White, Center on Wisconsin Strategy
36. Satya Conway Rose, Center on Wisconsin Strategy
37. Sharon Price, National Housing Conference
38. Sophie Chou, Camco
39. Stuart Cohen, Transportation and Land Use Coalition
40. Veronica Eady Famira, New York Lawyers for the Public Interest
41. Will Bradshaw, Green Coast Enterprises

Serena W. Lin is a poet, novelist, and essayist residing in Los Angeles. She works on issues of justice, poverty, urban environmentalism, climate change, and land use. Serena earned a degree in law from Boalt Hall and is a former public defender. Her parents—both chemists—hailed from Taiwan, and she is especially grateful to her father for subjecting her to endless hours of nature and wildlife shows and lectures on chemistry when she was a child. Thanks to her upbringing in front of the television, as well as the love of gardening and farming she shares with her sister, brother, and mother, she has an ever-deepening (if somewhat squeamish) acceptance that we live on this earth together with toads, spiders, and snakes. Actually, toads aren't that bad...

She is indebted to her friends, family, and PolicyLink (in particular Angela Glover Blackwell, Josh Kirschenbaum, Sarah Treuhaft, and Kalima Rose). Reach Serena at Lin.W.Serena@gmail.com.



8 Notes

¹ *Climate Change*, Shelley Tanaka, 2006. *Climate Change: What it Means for Us, Our Children, and Our Grandchildren*, Joseph F.C. DiMento, and Pamela Doughman, 2007. *An Inconvenient Truth*, Al Gore, 2006, http://www.pewclimate.org/global-warming-basics/basic_science, Union of Concerned Scientists, <http://www.ucsusa.org/>, American Geophysical Union, <http://www.agu.org/>, American Meteorological Society, <http://www.ametsoc.org/>

² Professor Martin Parry of UK's Meteorological Office —Peter Cox, "Passivhaus" Building for a Future, winter 2005/6.

³ The blanket analogy promotes better popular understanding for the scientific process of global warming than the greenhouse effect – "Weather or Climate Change?" Ann Bostrom, Georgia Institute of Technology, Daniel Lashof, NRDC as published in *Creating a Climate for Change*, 2007.

⁴ *Climate Change: What It Means for Us, Our Children, and Our Grandchildren*, Joseph F.C. DiMento, and Pamela Doughman, 2007, p. 22.

⁵ http://www.greenpeace.org/international/campaigns/climate-change/science/other_gases and http://unfccc.int/essential_background/kyoto_protocol/items/1678.php

⁶ http://www.pewclimate.org/docUploads/101_Science_Impacts.pdf.

⁷ http://www.pewclimate.org/docUploads/Climate101-FULL_121406_065519.pdf.

⁸ http://unfccc.int/kyoto_protocol/background/items/2879.php.

⁹ See Tanaka, p. 11.

¹⁰ http://nobelprize.org/nobel_prizes/peace/laureates/2007/ipcc-lecture_en.html.

¹¹ For a thorough description of climate change impacts, please see the IPCC's Fourth Assessment Report, "Impacts, Adaptation, and Vulnerability," <http://www.ipcc.ch/ipccreports/ar4-wg2.htm>.

¹² See generally, *Heat Wave: A Social Autopsy of Disaster in Chicago*, Eric Klinenberg, 2002.

¹³ IPCC, 4th Assessment Report, "Impacts, Adaptation, and Vulnerability." Chapter 14: North America.

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¹⁵ http://www.economics.noaa.gov/library/documents/benefits_of_weather_and_climate_forecasts/drought-climate_change-implications_for_west.doc

¹⁶ See generally *Managing Water: Avoiding Crisis in California*, Dorothy Green, 2007.

¹⁷ http://www.psr.org/site/DocServer/Global_Warming_Fact_Sheet_-_General__web_.pdf?docID=861.

¹⁸ See generally testimony by Dr. Howard Frumkin, Dr. Jonathan Patz, Dr. Georges Benjamin, Dr. Mark Jacobson, and Dr. Dana Best from the hearing "Climate Change and Public Health," April 9, 2008, House Select Committee on Energy Independence and Global Warming, <http://globalwarming.house.gov/pubs/?id=0036>.

¹⁹ <http://www.nphw.org/nphw08/NPHWpercent202008percent20Blueprint.pdf>

²⁰ See generally *The Atlas of Climate Change*, Kirstin Dow and Thomas E. Downing, 2006.

²¹ See generally testimony by Mike Williams and Dr. Eileen Gauna from the hearing "Energy and Global Warming Solutions for Vulnerable Communities," October 18, 2007, House Select Committee on Energy Independence and Global Warming, <http://globalwarming.house.gov/pubs/pubs?id=0017>

²² <http://www.ienearth.org/>.

²³ See generally, note 20.

²⁴ *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change*, ed. Susanne Moser and Lisa Dilling, Introduction, 2007.

²⁵ See note 1, p. 41.

²⁶ <http://www.environmentaldefense.org/page>.

cfm?tagID=51.

²⁷ <http://www.psr.org/site/>.

PageServer?pagename=Ozone_report_release

²⁸ <http://www.epa.gov/oar/urbanair/nox/hlth.html>

²⁹ <http://www.sciencedaily.com/releases/2002/10/021010065923.htm>.

³⁰ "Urbanization effects on tree growth in the vicinity of New York City," Jillian W. Gregg, Cornell University, *Nature*, July 10, 2003.

³¹ Free Air CO₂ enrichment at Duke University, <http://face.env.duke.edu/main.cfm>.

³² http://www.stanford.edu/group/efmh/jacobson/101807_testimony.htm, special thanks to Ramon Alvarez and James Wang of Environmental Defense Fund for informing me about the connection between black carbon and global warming.

³³ "Can Reducing Black Carbon Emissions Counteract Global Warming," Tami Bond and Haolin Sun, *Environment, Science, and Technology*, 2005, Vol. 39, "Soot Climate Forcing Via Snow and Ice Albedos," James Hansen and Larissa Nazarenko, *National Aeronautics and Space Administration Goddard Institute for Space Studies and Columbia University Earth Institute*, November 4, 2003.

³⁴ American Lung Association, "State of the Air: 2006."

³⁵ [http://static.uspirg.org/usp.asp?id2=5024&id3=USPIRG&Death, Disease & Dirty Power: Mortality And Health Damage Due To Air Pollution From Power Plants](http://static.uspirg.org/usp.asp?id2=5024&id3=USPIRG&Death,Disease%20%26%20DirtyPower:MortalityAndHealthDamageDueToAirPollutionFromPowerPlants). October 17, 2000, Clear the Air (the website no longer exists, I had to find it through PIRG website).

³⁶ *Heat*, George Monbiot, 2006, p.28.

³⁷ The largest and most well-funded environmental groups in the U.S. are often called "The Group of Ten" or "Big Green." They are: Defenders of Wildlife, Environmental Defense Fund, Greenpeace, National Audubon Society, National Wildlife Federation, Natural Resources Defense Council, The Nature Conservancy, Sierra Club, The Wilderness Society, and World Wildlife Fund.

³⁸ http://www.epa.gov/hg/control_emissions/index.htm

³⁹ United States EPA, <http://www.epa.gov/climatechange/emissions/downloads06/07ES.pdf>

⁴⁰ <http://www.energyjustice.net/ej/>

⁴¹ *The Atlas of Climate Change*, Kirstin Dow and Thomas E. Downing, 2006.

⁴² See generally www.gristmill.org to see varying opinions about carbon capture and sequestration and other cleaner coal technologies.

⁴³ See generally *High Noon for Natural Gas: The New Energy Crisis*, Julian Darley, 2004.

⁴⁴ <http://www.cbecal.org/legaldept/currentcase.html>

⁴⁵ <http://www.environmentalhealth.org/>

⁴⁶ <http://www.sierraclub.org/globalwarming/cleanenergy/renewablesfactsheet.pdf>

⁴⁷ http://www.ucsusa.org/assets/documents/global_warming/SB-1368-Fact-Sheet.pdf

⁴⁸ Special thanks to Leslie Lowe, Interfaith Center on Corporate Responsibility, for explaining this cycle to me.

⁴⁹ See the *Bali Principles of Climate Justice*, developed by the International Climate Justice Network, and *The Ten Principles for Just Climate Change Policies in the US*, created by the Environmental Justice and Climate Change Initiative.

⁵⁰ "As for my own country, the Maldives, a mean sea-level rise of 2 metres would suffice to virtually submerge the entire country of 1,190 small islands, most of which barely rise 2 metres above mean sea level. That would be the death of a nation. With a mere 1 metre rise also, a storm surge would be catastrophic, and possibly fatal to the nation."—President Gayoom of the Maldives, 42nd session of the UN General Assembly, October 19, 1987.

⁵¹ <http://www.iclei.org/>

⁵² <http://www.environmentaldefense.org/page.cfm?tagID=1085>

⁵³ <http://www.ejmatters.org/>

⁵⁴ See generally *Who Owns the Sky?*, Peter Barnes, 2001

⁵⁵ <http://www.aqmd.gov/RECLAIM/reclaim.html>, <http://www.healthandcleanair.org/emissions/index.html>

⁵⁶ This approach caps emissions at the level of oil or coal sales ("upstream"), rather than at the point in which various sources actually use or burn the fuel ("downstream" – which is the current level at which cap and trade proposals initially set the limit on emissions). Polluters can still trade permits within the cap, but all permits would be obtained through auction. All auction revenue would be put into a trust and paid out to every individual in the country equally.

⁵⁷ http://www.pewclimate.org/global-warming-basics/facts_and_figures/.

⁵⁸ http://www.climatechange.ca.gov/policies/greenhouse_gas_inventory/index.html

⁵⁹ www.dep.state.fl.us/air/documentation/GHG_Inventory.doc, <http://www.nj.gov/globalwarming/pdf/emissions-inventory-09-07.pdf>

⁶⁰ See generally Center for Housing Policy, "A Heavy Load: The Combined Housing and Transportation Burdens of Working Families." October 2006.

⁶¹ See generally *Crabgrass Frontier*, Kenneth Jackson, 1987.

⁶² See generally *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*, William J. Wilson, 1987.

⁶³ <http://www.upa.dot.gov/index.htm>

⁶⁴ <http://www.edf.org/page.cfm?tagID=6241>

⁶⁵ <http://www.grist.org/comments/soapbox/2006/12/11/hipolito/>

⁶⁶ "Growing Cooler: the Evidence on Urban Development and Climate Change," Reid Ewing, Keith Bartholomew, Steve Winkelman, Jerry Walters, and Don Chen, Urban Land Institute, 2007.

⁶⁷ Center for Transit-Oriented Development, "2007 Demand Estimate Update," available at www.reconnectingamerica.org/public/download/demestctod,

April 2008.

⁶⁸ John Stainbeck and William Reed, "A 10-Part TOD Finance Plan," Sustainability Concepts, *MassTransit*, available at http://www.sppre.com/news/articles/SC_10PartTODFinPlan.pdf [April 2008]

⁶⁹ See these and other reports from Reconnecting America and partners: The National Housing Trust & Reconnecting America, *Preserving Opportunities: Saving Affordable Housing Near Transit*, available at <http://www.reconnectingamerica.org/public/download/nhtraaff>; and Center for Transit-Oriented Development for FTA and HUD, *Realizing the Potential: Expanding Housing Opportunities Near Transit*, available at <http://www.reconnectingamerica.org/public/download/rtpexecsumm>

⁷⁰ PolicyLink, "Transit Oriented Development Tool," Equitable Development Toolkit, available at <http://www.policylink.org/EDTK/TOD/>

⁷¹ <http://www.fresc.org/>. Special thanks to Leslie Moody for calling my attention to FRESC.

⁷² A brownfield is a vacant lot or facility that has been permeated by toxics from prior industrial or commercial uses.

⁷³ Good Jobs First, *Making the Connection: Transit-Oriented Development and Jobs*, available at <http://www.goodjobsfirst.org/pdf/makingtheconnection.pdf>

⁷⁴ For more information, see the work of Dr. Bob Bullard, www.ejrc.cau.edu

⁷⁵ John A. Powell, http://www.pbs.org/race/000_About/002_04-background-03-06.htm

⁷⁶ <http://www.gastandup.org/>

⁷⁷ www.busridersunion.org

⁷⁸ http://www.pewclimate.org/global-warming-basics/facts_and_figures/

⁷⁹ <http://www.epa.gov/climatechange/emissions/downloads06/07ES.pdf>

⁸⁰ Center for Housing Policy, "A Heavy Load: The Combined Housing and Transportation Burdens of Working Families." October 2006.

⁸¹ http://www.brookings.edu/reports/2006/01_affordability_index.aspx

⁸² See note 80.

⁸³ Asians and Native Americans are not documented in "A Heavy Load."

⁸⁴ "African Americans and Climate Change: An Unequal Burden," Congressional Black Caucus Foundation, Inc., July 21, 2004.

⁸⁵ <http://www.usgbc.org/>

⁸⁶ See generally work of Danilo Pelletiere, National Low Income Housing Center, "A Push to Make Public Housing 'Green'," Sewell Chan, *New York Times*, December 7, 2007.

⁸⁷ <http://www.enterprisecommunity.org/>

⁸⁸ Passive construction does not use active mechanical construction, but instead utilizes design and architectural considerations to enhance environmental benefits.

⁸⁹ "Costs and Benefits of Green Affordable Housing" New Ecology, Inc. and Tellus Institute.

⁹⁰ "Now is the Time for Green Communities for Low Income Families," Enterprise Community Partners, 2008.

⁹¹ See note 86.

⁹² www.greenforall.org

⁹³ www.apolloalliance.org

⁹⁴ www.bluegreenalliance.org

⁹⁵ Special thanks to architect Gary Goldblum, Harley, Ellis, & Deveraux for all the work he has done around retrofitting research and proposals.

⁹⁶ "An Unnatural Disaster: The Aftermath of Hurricane Katrina," A Center for Progressive Reform Publication, September 2005, <http://www.progressiveregulation.org/>

⁹⁷ See generally http://www.environmentaldefense.org/documents/5237_katrinascostlywake.pdf

⁹⁸ See note 96.

⁹⁹ See generally work of Karen Wimpelberg, Alliance for Affordable Energy.

¹⁰⁰ Census 2000 SF1, Table H15B, Tenure by Household Size (Occupied Housing Units with a Black or African American Alone Householder)

¹⁰¹ *Ibid.*

¹⁰² Karen Wimpleberg, Alliance for Affordable Energy

¹⁰³ See generally work of Father Vien th  Nguyen, Pastor, Mary Queen of Vietnam Church, <http://www.villagevoice.com/news/0609,shaftel,72328,2.html>, <http://www.thebeehive.org/Templates/HurricaneKatrina/Level3NoFrills.aspx?PagelD=1.5369.6532.6843>

¹⁰⁴ <http://www.gbn.com/climatechange/ImpactsOfClimateChange.pdf>

¹⁰⁵ See generally work of Leslie Fields, Sierra Club, National Environmental Justice Director.

¹⁰⁶ See generally *Fatal Flood*, PBS, 2001, <http://www.pbs.org/wgbh/amex/flood/>, *Rising Tide: The Great Mississippi Flood of 1927 and How It Changed America*, John M. Barry, 1998.

¹⁰⁷ *Ibid.*

¹⁰⁸ The Red Cross officially counted 246 deaths, but this number is low. The exact number of those who died may ever be known.

¹⁰⁹ <http://www.greencoastenterprises.com/>

¹¹⁰ <http://www.all4energy.org/>

¹¹¹ http://www.makeitrightnola.org/mir_SUB.php?section=low9&page=com

¹¹² Does a butterfly flapping its wings in one place, alter the weather in another? For a brief description of the butterfly effect and chaos theory, see <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter1.pdf>.

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PolicyLink

Headquarters:

1438 Webster Street
Suite 303
Oakland, CA 94612
t 510 663-2333
f 510 663-9684

Communications:

55 West 39th Street
11th Floor
New York, New York 10018
t 212 629-9570
f 212 730-2911

www.policylink.org

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