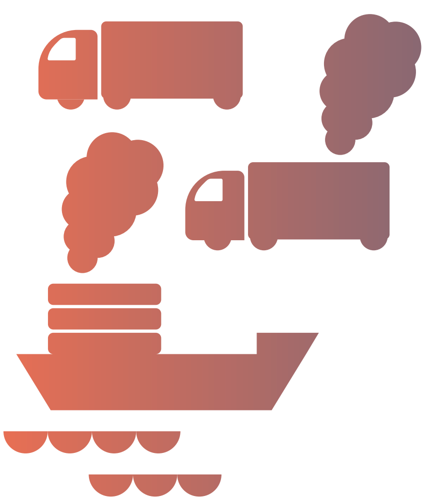
Air Quality and Climate Change Policy Briefs

February 2022

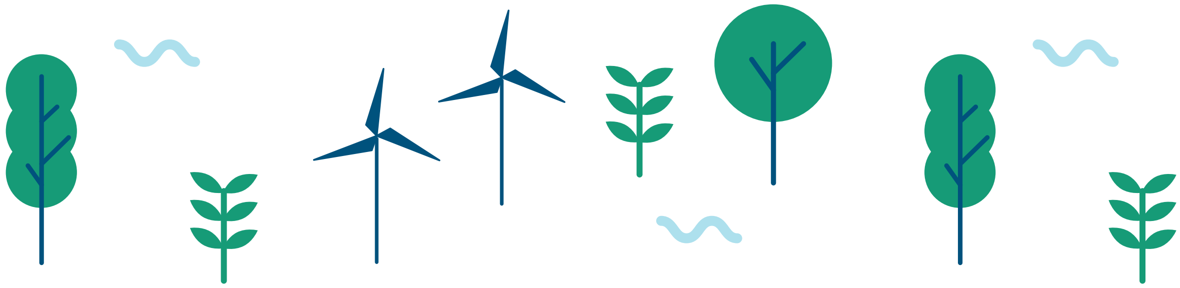


Air pollution and climate change are closely related. Many sources of planet-warming greenhouse gases (GHGs) also emit health-damaging air pollutants. Addressing climate change, however, does not always result in cleaner air. What's more, some climate policy solutions can actually make local air quality worse.

But it doesn't have to be this way—change and air pollution can be tackled together. With equity at the center, policy approaches that deal with both issues can address long-standing inequalities and deliver near-term local health benefits, as well as longer-term global climate impacts.

This brief is the first of a series that gives an overview of how we got here, major challenges, and potential solutions for equity-based climate and air quality policies.

THE Climate + Clean Energy EQUITY FUND



A short history of how air quality regulations started

To understand the policy solutions that can address the current air quality and climate crisis, it is important to understand the regulatory context of air quality and how air quality policies began as separate from climate change policymaking.

The Clean Air Act (CAA) is the primary federal law that regulates air pollution throughout the United States. States have the authority to implement more stringent requirements for certain sources, and state approaches vary widely. The modern Clean Air Act was passed in 1970 and strengthened in 1977 and 1990 in response to high levels of air pollution across the nation. The CAA "requires the [U.S. Environmental Protection Agency (EPA)] to set health-based standards for ambient air quality, sets deadlines for the achievement of those standards by state and local governments, and requires the EPA to set national emission standards for large or ubiquitous sources of air pollution, including motor vehicles, power plants, and other industrial sources."[1]

Generally, air pollutants (also known as air contaminants) are broken into two categories under the CAA: criteria air pollutants and hazardous air contaminants (see **Glossary 1**).

At the time of the CAA's creation and subsequent amendments, greenhouse gases were not recognized as a significant threat and not explicitly included as their own category. For the most, air pollution regulations have been separate from climate change policy. This approach has changed somewhat over the past decade; greenhouse gases are now regulated in a limited manner under the CAA. **Box 1A** describes the overlap and differences between greenhouse gases and criteria air pollutants.

"Addressing climate change does not always result in cleaner air—some climate policy solutions can actually make local air quality worse."

In Baltimore, Maryland, a predominantly Black community is breathing the toxic and harmful pollution mix from a nearby trash incinerator. Because the trash incinerator captures some of its own methane for energy, the state classifies the facility as "renewable" and counts it towards green energy goals.[2]

In Springfield, Massachusetts, a community surrounded by power plants spent years fighting off a large biomass facility—another type of energy classified as "green"—that would have made their already toxic air worse.[3]

2 https://www.baltimoresun.com/news/environment/bs-md-trash-incineration-20171107-story.html

3 https://www.wbur.org/earthwhile/2021/04/02/springfield-biomass-permit-revoked

1 https://www.everycrsreport.com/reports/RL30853.html

Box 1A:

What is the difference between GHGs and criteria air pollutants?

Criteria air pollutants and greenhouse gases (GHGs) are both major contributors to harmful emissions, but they do so in distinctly different ways. Criteria air pollutants are responsible for unhealthy air quality, which damages human health as well as the local environment. GHG emissions cause global warming, and while needed to regulate the planet's temperature, their exponential increase is driving today's climate change impacts. Several gases, such as nitrous oxide (N_2O) and methane, are both air pollutants and GHGs, causing dire health impacts and global warming.

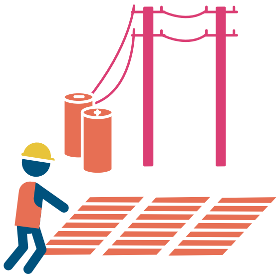
Many air pollutants that contribute to local health impacts are co-emitted with GHGs that contribute to climate change. However, not all air pollutants contribute to climate change. And not all greenhouse gases are air pollutants. For example, direct exposure to carbon dioxide (CO_2), the major GHG contributor, does not affect human health directly but has other indirect health impacts through climate change. Lastly, some GHGs have a stronger greenhouse gas effect, trapping heat at higher rates. They are known as **short-lived climate pollutants** (see **Glossary 2**) and are starred in **Table 1**, below.

Table 1. List of air pollutants and greenhouse gases

	Air pollutant	Greenhouse gas	Impacts human health directly
Particulate matter (PM2.5)	✓	X	✓
Sulphur dioxide	✓	X	✓
Nitrogen dioxide	✓	X	✓
Ground-level ozone	✓	✓	✓
Carbon monoxide	✓	X	✓
Carbon dioxide	X	✓	X
Nitrous oxide	X	✓	X
Lead	✓	X	✓
Particulate matter (PM10)	✓	X	✓
Methane*	✓	✓	✓
Black carbon* (soot)	✓	✓	✓

* These are short-lived climate pollutants.

How mainstream climate policies fall short of local impacts



Traditional climate policy has failed to adequately integrate and consider local air quality improvements. Traditional climate policy has focused on reducing major greenhouse gases responsible for the planet's warming, such as carbon and methane emissions. From a climate perspective, location is less important because a greenhouse gas emitted anywhere in the world contributes to climate change globally. Moreover, the impacts of climate change are rarely tied to the emission source. The worst climate impacts—resulting in severe economic, health, ecological, and social consequences—are happening in countries that emit the least greenhouse gases, which also reflects major inequities.

At the same time, because many health-damaging pollutants and GHGs overlap, climate policies should be able to benefit local air quality. In climate policy, contaminants that are known to cause local air pollution are called "co-pollutants" to GHGs. The air quality improvements—and other public health benefits more broadly—achieved through climate change policy are often called the "co-benefits" of climate policy. So, theoretically, reducing greenhouse gas emissions would also achieve co-benefits like improved air quality and improved public health, as well as additional economic benefits from the cost savings of confronting these issues.[4]

But in practice, local air quality improvements tend to fall through the cracks. Because climate change is seen as a global issue not a local one, policies tend to look at emissions in the aggregate, examining what is happening with GHGs on a sector, state, national, or global level. Traditional climate policies, such as carbon pricing, rarely focus on emissions from specific facilities, and GHG reduction is generally tracked and analyzed on the aggregate level. Traditional climate policies also favor indirect emission reductions—such as "carbon offsets"—over direct emission reductions, which may reduce GHG emissions in the aggregate but do not reduce local health-damaging pollutants (see **Glossary 3**). For example, a steel mill interested in reducing its GHG footprint may buy carbon offsets (an indirect reduction), instead of installing pollution control technology or upgrading their infrastructure (a direct reduction). The carbon offset could be based on forest restoration in Indonesia, which means that the communities around the steel mill do not actually benefit from the emission reduction.[5]

As a result, the focus on the aggregate can deprioritize local air quality improvements and reductions at direct emission sources, which impact low-income communities of color the most. While there are many valid reasons to track GHGs at the aggregate level, especially for global cooperation and negotiations, the downside is that polluters are less likely to be held accountable, and marginalized communities seldom receive clean air and climate benefits. This inequity needs to change. A growing body of research documents the correlation and simultaneous release of GHGs and co-pollutants.[6] By addressing air quality and climate change together, we can achieve equitable policies and plans that address today's environmental and climate crises.

"The focus on aggregate GHG levels can deprioritize local air quality improvements and reductions at direct emission sources, which impact low-income communities of color the most."

4 https://www.nrdc.org/sites/default/files/boosting.pdf

5 How the carbon offsets are valued is also up for debate, and many environmental justice advocates argue that carbon offset programs often overestimate climate benefits. See, for example, https://www.pnas.org/content/117/39/24188.

6 https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002604

Major sources of air pollutants and GHGs

There are four general categories for sources of air pollutants and GHGs (see Figure 1). The two largest sources are **mobile** (cars, buses, trucks, etc.) and **stationary** (power plants, industrial facilities, etc.). Other sources include **area** sources, such as methane from agricultural areas (see **Box 1B**), and **natural** sources, such as smoke from wildfires and wind-blown dust (see **Box 1C**).

Mobile sources are the single-largest source of GHG emissions in the United States, accounting for 29 percent of all emissions in 2019.[7] The percentage can be much higher depending on location. Mobile sources are also significant contributors to air pollution, largely due to the release of diesel particulate matter as well as other air toxics.[8]

Low-income communities and communities of color face most of the environmental burden from the movement of goods across the country. Low-income communities and communities of color are more likely to live near highways, ports, and rail facilities, which transport massive quantities of goods on a daily basis using diesel trucks and trains. The country's 100 largest metropolitan areas are the major hubs of U.S. freight activity, "moving more than $8.1 trillion, or 60 percent, of all the nation's goods that travel by truck."[9] The "goods movement industry" relies on diesel fuel, which has higher levels of health-endangering air contaminants.

While each source requires slightly different solutions (covered in Brief 3), the bottom line is that reducing both greenhouse gas emissions and local air contaminants is critically important for achieving environmental justice.

7 https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

8 https://www.epa.gov/mobile-source-pollution/how-mobile-source-pollution-affects-your-health

9 https://www.brookings.edu/wp-content/uploads/2015/06/srvy_gcifreightmodes_june12.pdf

Box 1B:
Agriculture and air quality

The agricultural industry is a significant contributor to climate change and poor air quality. The conventional model of large-scale industrialized agriculture dominant in the United States is highly resource intensive and has multiple environmental impacts, from climate to air and water quality. The industry overall has extremely poor working conditions and few labor protections for farm workers, as well.

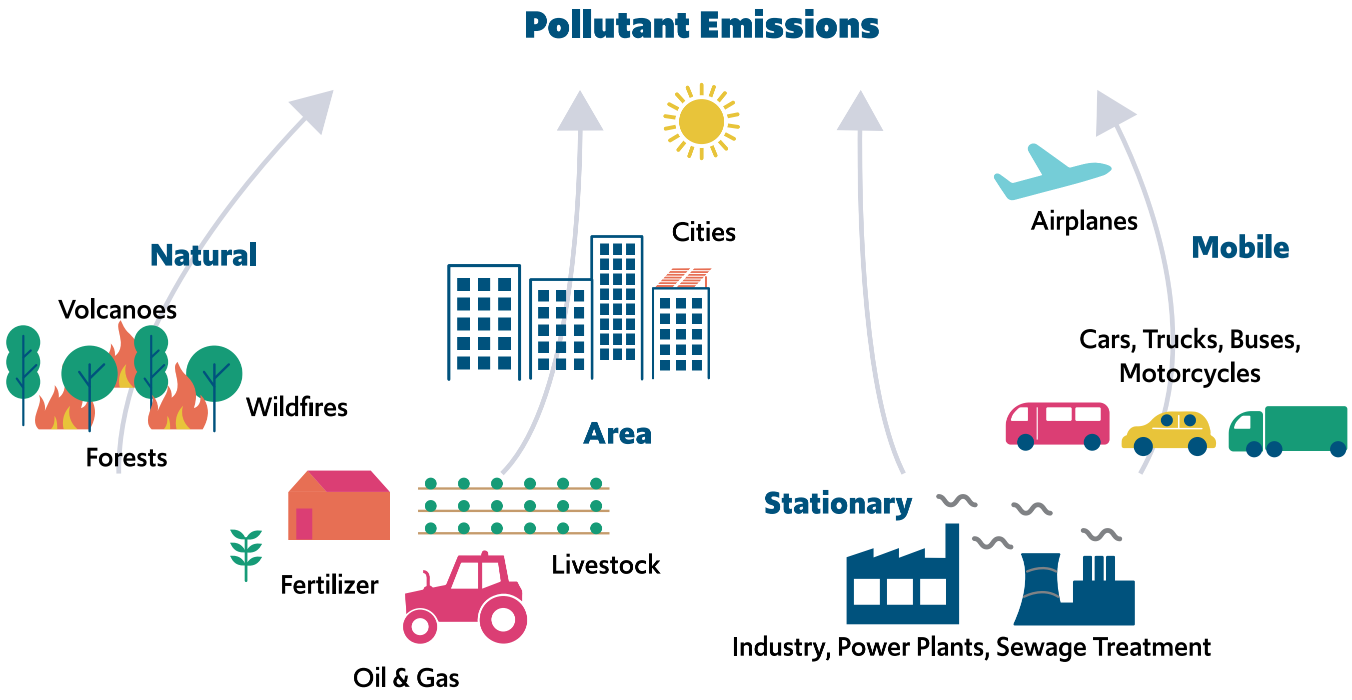
In 2019, U.S. agriculture contributed 10 percent of overall GHG emissions throughout the nation.[10] The largest source of direct agricultural emissions are methane from livestock, both in the form of enteric fermentation (digestion) and management of manure. Application of synthetic fertilizers and fossil-fuel-powered farm machinery and irrigation are the two other main sources of emissions.[11] These activities collectively release large quantities of methane, nitrous oxide (N_2O), and nitric oxide (NOx). All of these emissions have significant impacts on air quality and human health: methane is a precursor to ozone, which is the main ingredient to smog, and both nitrous and nitric oxide are main constituents of particulate matter, a very harmful air pollutant.[12] A few solutions include regulations on methane and fertilizer application, improved soil and manure management, and transitioning farms to renewable energy.

10 https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

11 http://www.fao.org/news/story/en/item/216137/icode/

12 https://www.earth.columbia.edu/articles/view/3281

Figure 1: **The four major sources of air pollutants and GHGs**



Source: https://www.nps.gov/subjects/air/sources.htm

Box 1C:
Wildfires, air quality, climate change and equity

Climate change is leading to increased wildfires. Many western states have already broken records for the duration, quantity, and size of wildfires, and these fires are only projected to increase.[13] Hot, dry weather increases the likelihood of wildfires starting, and degraded forest ecosystems create conditions for fires to easily spread and gain intensity. Wildfires can lead to the loss of life and billions of dollars in property damage.

Wildfires also emit large quantities of GHGs, including both carbon dioxide and black carbon (soot). For example, the 2018 wildfire season in California released emissions equivalent to about 15 percent of all California emissions (equal to the emissions produced by generating enough electricity to power the entire state for a year).[14]

Wildfires cause increasingly significant air quality impacts that harm health and quality of life by releasing large quantities of particulate matter and creating smoky days where outdoor activities are hazardous and unhealthy. The increased rates of wildfires raise numerous policy and equity issues, from disaster response, to liability, to post-fire rebuilding. Some key populations to consider include outdoor workers, non-English-speaking populations, households without access to AC and air filtration systems, and housing-insecure folks at most risk of displacement.

Note: Climate resilience, disaster preparedness, and relevant equity considerations will be discussed in depth in a future brief.

13 https://www.c2es.org/content/wildfires-and-climate-change/

14 https://www.doi.gov/pressreleases/new-analysis-shows-2018-california-wildfires-emitted-much-carbon-dioxide-entire-years

Glossaries

Glossary 1. The two categories of air pollutants used in the Clean Air Act

Criteria Air Pollutants	These pollutants harm health and the environment. The U.S. Environmental Protection Agency (EPA) has set acceptable levels for how much of these pollutants can be in the air, otherwise known as "ambient levels." Areas that are at or below this level of concentration are in "attainment" of air quality standards, and areas that are above this level are in "nonattainment." In other words, most criteria pollutants must stay below a certain level in order to keep local air quality healthy. For some criteria pollutants, such as particulate matter, there is no known safe level. The six criteria pollutants are: ▪ Ground-level ozone, such as from vehicle exhaust and industrial activities; ▪ Particulate matter, such as from car engines and smoke; ▪ Carbon monoxide, such as from burning coal, oil, and wood; ▪ Lead, such as from industrial activities; ▪ Sulfur dioxide, such as from coal plants; and ▪ Nitrogen dioxide, such as from burning fuels and vehicle exhaust.
Hazardous Air Contaminants	These air pollutants can cause serious health effects from exposure at extremely low levels, and there may be no safe level of exposure. Examples of hazardous air contaminants include: ▪ Benzene, found in gasoline; ▪ Asbestos, used for construction and insulation; ▪ Perchloroethylene, emitted from some dry cleaning facilities; and ▪ Chloroform, often used in building industries and pesticides.

Glossary 2. Short-lived climate pollutants

Short-lived climate pollutants are emissions that stay in the environment for a shorter period of time than carbon dioxide but have a much more intense impact on global warming and, sometimes, air pollution. Often called "super pollutants," the main short-lived climate pollutants include the following.

- **Black carbon**, also known as soot, is a main constituent of particulate matter, which is the air pollutant that is most harmful to human health and the primary driver of air-pollutant-induced mortality. It comes from the burning of fuels such as coal, diesel, and biomass, as well as from various forms of non-fuel burning of woody wastes and wildfires. Modern air quality regulations have reduced black carbon from many industrial processes, but emissions from mobile sources persist. Solutions that reduce black carbon as an air pollutant are discussed in **Brief 3**.
- **Methane** contributes to the creation of ozone, one of the major components of urban smog. Methane is 28 to 34 times more potent at warming than carbon dioxide over a 20-year period.[15]
- **Hydrofluorocarbons (HFCs)** are a group of chemicals used for refrigeration and cooling that make significant contributions to the depletion of the atmospheric ozone layer and are being phased out under the Montreal Protocol, an international treaty to protect the ozone layer.[16] Additional improvements in energy efficiency and industrial production are reducing the need for HFCs, although increased attention to recycling and disposal of HFCs in older appliances is needed. Both of these goals can also be enhanced or achieved through statewide policies.

Glossary 3. Direct vs. indirect emissions

Direct emissions refers to emissions from sources that are owned or controlled by the reporting entity. They include fossil fuel facilities, freight facilities, ports, private gas-powered vehicles, and trash incinerators—anything that directly releases GHGs and/or health-damaging air pollutants into the environment. In other words, direct emissions come from the entities directly responsible for air pollution, and policies targeting **direct emission reductions** usually direct specific facilities to reduce their emissions below a certain level. A regulatory agency sets a limit on pollution, and polluters must comply or face a penalty of some sort. Many aspects of the Clean Air Act utilize direct regulation, such as New Source Review[17] or the Prevention of Significant Deterioration.[18]

On the other hand, the term **indirect emissions** refers to pollution caused by one entity, even though the pollution is actually emitted elsewhere, at a source owned or controlled by another entity. They include GHG emissions from purchased electricity or heat in buildings and warehouses from the burning of fossil fuels. **Indirect emission reductions** may reduce GHG emissions in the aggregate but may not always reduce local emissions. Sometimes, indirect emission reductions may even increase local emissions in trade for an emission reduction elsewhere. This arrangement can be very problematic for environmental justice communities that most often bear the brunt of costs for a marginally beneficial "trade-off" (further discussed in **Brief 2**).

15 https://pubs.acs.org/doi/full/10.1021/acs.est.6b00705

16 https://www.ccacoalition.org/en/slcps/hydrofluorocarbons-hfc

17 https://www.epa.gov/nsr

18 https://www.epa.gov/nsr/prevention-significant-deterioration-basic-information

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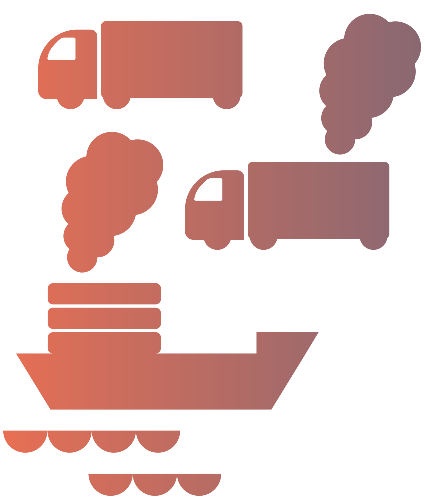
3 Policy Solutions



Achieving justice related to air quality means that all communities can breathe clean and healthy air, no matter where they live, work, or play. To realize clean air for all, the disproportionate burden of dirty and toxic air for low-income communities of color must be addressed, and we must fundamentally change how we generate energy and move people and goods. Furthermore, as our country transitions to clean energy and prepares for climate change, policies must also minimize dangerous pollution for all communities, starting with those already burdened with dirty air, which also significantly overlaps with those who will be most impacted by climate change.

Even though tackling climate change and air quality together maximizes many benefits for all—such as cleaner communities, fewer health risks and premature deaths, and improved climate mitigation, to name a few—the current policy landscape presents several barriers. In this brief, we provide an overview on injustices today, major policy challenges, and key frameworks to consider when crafting equitable air quality and climate policies together.

THE Climate + Clean Energy EQUITY FUND

Snapshot of air quality issues and injustices today

Despite significant improvements in air quality across the country, air pollution remains a serious issue in the United States. The American Lung Association's 2021 annual State of the Air report shares the following facts:[19]

- **More than four in 10 Americans, over 135 million people, are living in places with unhealthy air pollution, particularly ozone (smog) and/or particle (soot) pollution.**
- **Three out of every eight Americans live in counties with the worst levels of ozone, including 28.1 million children and 18.2 million people age 65 or older, who are more vulnerable to increased risk of harm.**
- **The three years covered by State of the Air 2021 ranked among the six hottest years on record globally.**
- **New research shows that exposure to elevated levels of air pollution is linked to worse health outcomes from COVID-19, including higher death rates.**
- **Many cities increased the number of days when particle pollution rose to record-breaking levels and year-round levels increased. Los Angeles remains the city with the worst ozone pollution in the nation.**
- **Certain climate impacts, such as wildfires and increased heat, will exacerbate air quality issues (see Box 2A). Because both climate impacts and air quality issues are inequitably distributed, the cumulative risk to at-risk communities should ring alarm bells.**

19 https://www.lung.org/assets/documents/healthy-air/state-of-the-air/sota-2019-full.pdf

Box 2A:
The effect of climate change on air pollution

Climate disasters can increase poor air quality. The 2021 State of the Air report documented spikes in high ozone days and unhealthy particle pollution episodes related to wildfires and extreme heat, which are exacerbated by the climate crisis.[20] How to adequately plan for and reduce the harm of air pollution from more frequent and unpredictable extreme weather events will be a major question for the coming decades. The effects will not only be alarming, but wildly uneven. For example, farmworkers in rural areas may not have access to inside shelter during increased incidences of poor air quality and heat waves. Climate adaptation measures and air quality policies must work hand in hand to protect our communities adequately.

Increased temperatures—particularly in urban heat islands (areas with dense concentrations of pavement, buildings, and other surfaces that and retain heat, like industrial and commercial areas)—combined with a steady stream of tailpipe emissions from a nearby highway can multiply the threat of smog. Studies show that breathing smog in urban heat islands is several times more harmful than tailpipe emissions alone.[21] Unsurprisingly, low-income communities of color are most likely to live or work near these areas. Addressing this issue requires a holistic look at plans and policies that can both mediate the heat island effect and clean the air, but this issue may not be a priority when policymakers separate air quality and climate change.

20 https://www.lung.org/research/sota/key-findings

21 https://www.epa.gov/heatislands/heat-island-impacts#emissions

Inequitable pollution burden and health risks

Exposure to air pollution is not distributed equally across geographies, race, or income. Throughout the United States, numerous studies have established the disproportionate burden of pollution that impacts low-income communities and communities of color.

- **People of color are more than three times more likely to be breathing the most polluted air than white people.**[22]
- **Almost 70 million people of color live in counties that received at least one failing grade for ozone and/or particle pollution by the American Lung Association. Nearly 14 million people of color live in counties that received failing grades on all three measures, including 9.7 million Hispanic/Latinx people.**[23]
- **More than 15.8 million people experiencing poverty (according to the federal definition) live in counties that received a failing grade for at least one pollutant.**[24]
- **A 2018 study showed how people experiencing poverty have a 1.35 times higher exposure burden to particulate matter than the overall population and people of color had 1.28 times higher burden. Black populations faced the highest burden: 1.54 times higher than the overall population.**[25]
- **People of color are 2.5 times more likely than white populations to live in an area with dangerous concentrations of nitrogen dioxide (NO_2), which comes from traffic exhaust.**[26]
- **Nearly 30.6 million children under age 18 and 20.1 million adults age 65 and over live in counties that received a failing grade for at least one pollutant.**[27]

22 https://www.lung.org/research/sota/key-findings/people-at-risk

23 https://www.lung.org/research/sota/key-findings/people-at-risk

24 https://www.lung.org/research/sota/key-findings/people-at-risk

25 https://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2017.304297

26 https://ehp.niehs.nih.gov/doi/10.1289/EHP959

27 https://www.lung.org/research/sota/key-findings/people-at-risk

Impacts from poor air quality

Air pollution is a serious health threat. Particles in air pollution can be smaller than $1/30^{th}$ the diameter of a human hair. When inhaled, these particles are small enough to get past the body's natural defenses. Air pollution can trigger asthma attacks, harm lung development in children, and even be deadly.

- **Breathing ozone can irritate the lungs, resulting in inflammation.**
- **Breathing in particle pollution can increase the risk of lung cancer.**
- **Ozone and particle pollution are both linked to increased risk of lower birth weight in newborns.**
- **Overall, exposure to air pollution leads to a range of health impacts, including increased respiratory issues, premature death, impaired lung development, cancer, and cardiovascular disease.**

These health impacts in turn have a range of economic and quality of life impacts, such as lost school- and work-days and increased healthcare costs.[28] Given the disproportionate exposure of communities of color and low-income communities to air pollution, combined with socioeconomic pressures, such as lack of access to health care, negative health impacts consistently show up in alarmingly higher rates among people of color and those with lower incomes.[29]

28 http://www.dnrec.delaware.gov/dwhs/Info/Regs/Documents/alac_impacts_fs.pdf

29 https://www.lung.org/our-initiatives/healthy-air/outdoor/air-pollution/disparities.html

Approaching air quality and climate change separately exacerbates inequities

For communities already bearing the brunt of air pollution, the distinction between climate and local air pollutants is irrelevant: both are causing harm to health and quality of life. Whether these communities are on the fenceline of large stationary sources (like power plants) or alongside freeways clogged with vehicles, the same machinery is releasing both greenhouse gases (GHGs) and air pollutants. At-risk communities often live in pollution "hot spots" where there are high concentrations of both GHGs and health-damaging emissions.

Policy measures targeted at direct emission reductions often hold the most potential to improve localized conditions in low-income communities and communities of color, achieve air quality benefits, and reduce GHGs. But these actions may have higher upfront costs (both economically and politically), and polluters, developers, and even mainstream climate advocates will instead back indirect or compromised solutions that negotiate away air quality gains. Moreover, as covered in **Brief 1**, the tendency to look at all GHG emissions together and seek solutions with the lowest short-term costs can undermine efforts to achieve reductions at direct emission sources. This approach will overlook "hot spots" when GHGs are only tracked at the sector, state, national, or global level.

Overall, carbon reduction as the primary measure of success can be problematic. "Carbon-centric" climate policies[30] will often regard "co-benefits"—such as cleaner air and/or water or public health benefits—as an optional bonus. Or worse, advocates for such policies will argue that carbon reduction must come first, and other long-standing inequities can be dealt with elsewhere or later. This approach leads to increases in local air pollution and health risks in already-burdened communities.

For example, climate policies that allow trading (such as "cap-and-trade" programs) or "net-zero" commitments can result in increased local pollution in areas with poor air quality, despite lowering total emissions in a larger region (see Box 2B). This strategy is particularly devastating to communities living near polluting facilities—they shoulder most of the costs and receive very few climate benefits. This trend is a common consequence of market-based mechanisms, which rely on pricing signals to create incentives to reduce climate pollution, such as a carbon tax. While status-quo advocates might characterize this solution as a mere "trade-off," environmental justice communities have long fought against such inequitable policies.

"For communities already bearing the brunt of air pollution, the distinction between climate and local air pollutants is irrelevant: both are causing harm to health and quality of life."

30 Policies that use carbon reduction as the primary measure.

Major challenges to crafting policy solutions to address air quality and GHGs

The following points summarize major policy challenges to addressing air quality and climate change:

Local impacts overlooked or negotiated away by mainstream climate policies

- **Many proposed GHG regulations do not look at local emission impacts from specific facilities** that might be driving poor health and air quality issues in communities.
- **Many climate policies include mechanisms like offsets that are designed to keep global carbon emissions below a certain level but may create opportunities for localized emissions to increase.** This strategy can increase air pollution burdens on already-overburdened communities that, most of the time, lack strong political power.
- **Many mainstream climate advocates and economists do not advocate for inclusion of air quality regulations in climate policies**, and sometimes they argue that it is easier to deal with air quality separately from climate change.
- **Industry, state agencies, and even mainstream climate advocates often oppose direct emission reductions**—such as pollution-control equipment, changing fuel sources, and/or changing production levels—as being too costly and complicated to implement. Instead, they may favor market-based approaches. Both traditional climate advocates and industry often argue that market-based mechanisms are more effective and flexible, ignoring the cost to disenfranchised communities that continue to bear the brunt of pollution.

No "across-the-board" solutions for air pollutants

- **GHGs and co-pollutants may require different control technologies.** Control of GHGs are better suited to a fairly straightforward and limited set of options: limiting production, increasing efficiency, changing fuels, or changing how energy is produced. On the other hand, a much wider range of emission-control technologies exists for various air contaminants, but they can be more difficult to install, varying across contaminants and type of operation. As a result, applying across-the-board solutions, particularly for air contaminants, is more difficult.
- **Establishing the target for both localized GHG and contaminant reduction can be a technically complicated process** that often varies from facility to facility and pollutant to pollutant, and this complexity can be used as an argument against enacting across-the-board regulations.
- **Some mobile source emissions can vary depending on the pollutant.** For example, locomotives have fewer GHG emissions but higher nitrous oxide and particulate matter emissions, creating a greater health risk. The reverse is true for liquified natural gas vehicles, which have lower particulate matter emissions but higher methane emissions.

> *"Both traditional climate advocates and industry often argue that market-based mechanisms are more effective and flexible, ignoring the cost to disenfranchised communities that continue to bear the brunt of pollution."*

Poor implementation, due to bureaucratic roadblocks and/or industry pressure

- **Even when there is strong language requiring air quality co-benefits and protections in low-income communities**, the implementation can be inadequate due to bureaucratic roadblocks or industry pressure. For example, in California language in policy protects environmental justice communities, but implementation has been stalled by recalcitrant state agencies and industry lobbying.[31] In addition, the language related to protections can be vague and hard to enforce.
- **Similarly for direct emission reductions, many state or local agencies are often susceptible to industry pressure or are under-resourced and will often fail to enforce a policy**, sometimes intentionally. In other cases, despite long-standing violations of air quality standards, no action has been taken by regulatory agencies.
- **Direct emission reductions can also be susceptible to weakening provisions that prioritize cost over public health or environmental benefits**. Policies often include a cost–benefit analysis or language that allows an agency to determine what is considered "financially feasible" for regulated entities. If the cost is determined to be too high (in other words, not financially feasible), pollution limits will be set higher to accommodate polluters that lobby hard for weakened standards and inflate potential costs of any regulation. These analyses often fail to comprehensively consider the many benefits of reducing harmful pollution.

Limited scope of CAA authority

- **While the Clean Air Act (described in Brief 1) can be used to regulate GHGs, there are ongoing legal questions about what the law actually covers and how effective it is.** Some lawyers argue that the CAA's authority is limited,[32] while other argue that its authority is broad enough to regulate GHGs.[33]

Shortcomings in data and monitoring

- **State and national agencies often have separate databases and systems for tracking air contaminants and GHGs.** This situation creates a technical barrier to monitoring and understanding the link between contaminants and GHGs and to implementing policies that regulate both categories.
- **Air pollution can be locally specific, with different contaminants in different communities impacting relatively small geographic areas.** Understand the levels and sources of different contaminants can require a range of monitoring systems, which can also be expensive.
- **Air contaminants are traditionally regulated on a contaminant-by-contaminant basis**. This fragmented process overlooks the total amount of pollution released as well as spikes in a particular contaminant's emission levels that may have acute health impacts. For example, the EPA examines pollution by type of facilities and equipment separately. A 2021 Propublica report found that a narrow focus on point source pollution vastly underestimates fenceline communities' exposure. When the risk from all the nearby polluting sources is considered together, estimated excess risk of cancer can be three to six times higher.[34]

Silos across relevant sectors and agencies

- **Many mobile source air quality and climate solutions require changes to and better coordination across land-use planning regulations** and agencies, which can be difficult.
- **Rapidly expanding clean mass transit is a key piece of reducing mobile source air quality and GHG emissions but is often "siloed" or kept separate from climate and clean energy policy discussions**, which can lead to an overemphasis on electrification of personal vehicles and low-carbon fuel regulations.

31 https://www.eastbaytimes.com/2021/10/24/how-a-landmark-environmental-justice-bill-is-failing-to-protect-richmonds-air/?utm_id=40735&sfmc_id=4509553

32 https://niskanencenter.org/blog/section-115-not-a-viable-climate-policy-option/

33 https://www.law.georgetown.edu/environmental-law-review/wp-content/uploads/sites/18/2019/04/GT-GELR190001.pdf

34 https://www.propublica.org/article/toxmap-poison-in-the-air?s=09

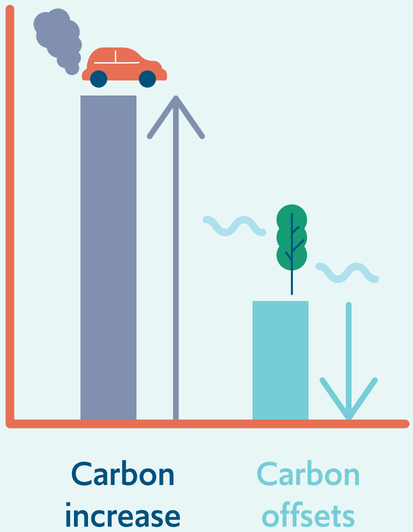
Box 2B:
Net-zero vs. zero-emission targets: A cautionary tale

Net-zero targets frequently appear in mainstream media as the "solution" to today's climate crisis. Large multinational companies—such as BP, Shell, Nestle, Boeing, and others—have pledged net-zero targets. But what does this promise really mean? And is it enough?

The short answers are "not much" and "not really." For these targets to be achieved, many companies purchase "offset credits" if they cannot reduce the carbon emissions they are capped at. These offset credits allow one company to continue to emit carbon, while they pay for offset credits that ensure another company reduces their own emissions or sequesters CO_2 to "compensate" for the other companies' emissions. However, with one entity continuing to emit emissions, there may be no overall emission reductions from an offset.[35] Companies that can buy offsets are not obligated to reduce the criteria and/or toxic air pollutants they release locally.

Furthermore, net-zero targets often encourage a pace of climate mitigation that is far too slow for what is needed today. If the balance between emissions and removals is only achieved by mid-century, a huge amount of additional GHGs will be added every year until the balance is reached. By then, it will be too late to prevent the worst climate impacts.

Many climate advocates argue that net-zero targets are distractions from working for zero-emission targets, which are what we really need to keep global average temperature rise below 1.5 degrees Celsius. **Zero-emission targets** ensure that no carbon emissions are being produced by a service or product. This approach incentivizes a transition to systems powered entirely by renewable energy, which also entails a drastic reduction in air pollution—a huge win for low-income communities and communities of color most burdened with dirty air.[36]



"If the balance between emissions and removals is only achieved by mid-century, a huge amount of additional GHGs will be added every year until the balance is reached. By then, it will be too late to prevent the worst climate impacts."

35 https://www.foei.org/resources/publications/chasing-carbon-unicorns-carbon-markets-net-zero-report

36 Major reductions in air pollution would come from clean energy and transit systems. However, given our current pace of global warming, it is important to note that it is unknown how more wildfires will increase air pollution and in what areas.

Key frameworks to consider when crafting air quality and climate policies

We have the tools today to build zero-emission systems with minimal pollution that keep our communities safe, healthy, and equitable. When developing policies, it is important to understand the different sources of both air quality contaminants and greenhouse gases. Different sources often require different policy solutions, but there are also ways to address both issues at once. Within each framework, we prioritize strategies that will most clearly achieve direct emission reductions from each source and, therefore, have the most immediate improvement on localized conditions in low-income communities and communities of color. Thus, this policy brief focuses on the two largest categorical sources: mobile and stationary.

1. Prioritize the most polluted communities.

The most effective climate policies address air quality issues in low-income communities and communities of color together. Integrated, equity-based climate and air quality policy solutions often focus on the places where impacts are the worst and where the win–win benefits of reducing GHGs and air contaminants can be maximized. Policymakers can tackle multiple issues at once: better public health, cleaner air and water, proactive investments in historically under-resourced communities, climate mitigation, and a broader base for future climate wins.

"We have the tools today to build zero-emission systems with minimal pollution that keep our communities safe, healthy, and equitable."

2. Target the dirtiest sources.

Policies tailored for stationary sources—such as power plants, refineries, and manufacturing facilities that emit air pollutants and GHGs—are the most effective way to improve air quality for "hot spots" and reduce GHG emissions at the root source. Nationwide, these facilities include 144 refineries and 1,369 power plants, among many other sources.[37] Ultimately, these fossil fuel sources must be phased out as the long-term solution to both climate change and improving air quality, but regulating their current emissions is critical to reducing GHGs and improving air quality. This strategy also applies to area sources and smaller stationary sources, especially near where people live.

3. Clean up how we move.

Since mobile sources are the largest contributor to GHGs in the United States and a major contributor to poor air quality, it is critically important to prioritize equitable policies that clean up how we move people and goods. Mobile sources include automobiles, motorcycles, trucks, off-road vehicles, boats, and airplanes. Reducing mobile source emissions presents significant opportunities to improve both air quality and GHG emissions and is critical to improving the health of environmental justice communities. In the long term, solutions for mobile source pollution should also include massive investments in public transit and overall shifts to make land-use planning more sustainable and the electrification of vehicles more equitable.

37 https://www.epa.gov/ghgreporting/ghgrp-reported-data

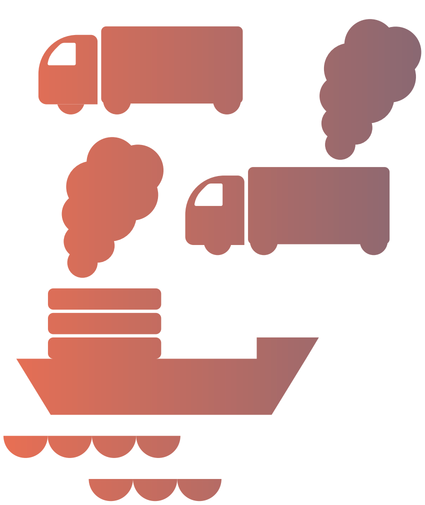
Air Quality and Climate Change Policy Briefs

February 2022

1 Overview

2 Towards Justice for Air Quality and Climate Change

3 Policy Solutions



Potential solutions must seek to address the decades-long injustices that have been faced by low-income and Black, Indigenous, and People of Color (BIPOC) communities. This brief will look into specific policy solutions that move us toward justice in air quality and climate change.

These solutions fall under three key frameworks:

1. Prioritize the most polluted communities;

2. Target the dirtiest sources; and

3. Clean up how we move.

THE Climate + Clean Energy EQUITY FUND

1. Prioritize the most polluted communities: Integrated equity-based climate and air quality policies

1.1 **Identify communities that face a disproportionate burden of pollution.** Policymakers need a way to identify communities that are most vulnerable to pollution and climate change. Over the past decade, new tools have been developed that identify a range of pollution and socioeconomic indicators and map which communities have high rates of all indicators. These tools use a "cumulative impact" framework. This approach takes into account the reality that many low-income communities and communities of color face a whole range of pollution burdens as well as socioeconomic factors (such as poverty and unemployment) that make people more vulnerable to pollution. **Cumulative impacts** are defined as "the exposures, public health or environmental effects from the combined emissions and discharges, in a geographic area, including environmental pollution from all sources, whether single or multimedia, routinely, accidentally, or otherwIse released. Impacts will take into account sensitive populations and socioeconomic factors, where applicable and to the extent data are available." Areas with high concentrations of these factors have a greater "cumulative impact."[38]

Environmental justice screening tools are most effective when implemented on a smaller geographic scale, such as census-tract level. Examples of state-level tools include the **CalEnviroScreen** tool developed in California,[39] the **Washington Environmental Health Disparities** map,[40] and the **Massachusetts Environmental Justice Communities** map.[41] Other examples of even more localized environmental justice maps include the **Twin Cities Environmental Justice Mapping** tool[42] and the **Cumulative Environmental Vulnerabilities Assessment of California's San Joaquin Valley.**[43]

Creating such a tool can be a foundational step towards targeting benefits and increased protections to overburdened communities. State policies can direct agencies to create and utilize a cumulative impact screening tool in various programs and for funding. The term "disadvantaged communities" has emerged in several state policy contexts as a way to refer to communities identified through screening tools. The State of New York's **Climate Leadership and Community Protection Act** requires that a Climate Justice Advisory Committee "establish criteria to identify disadvantaged communities for the purposes of co-pollutant reductions, greenhouse gas (GHG) emissions reductions, regulatory impact statements, and the allocation of investments."[44] California's CalEnviroScreen tool has been used in numerous policies to direct increased funding and environmental protections into communities identified as highly impacted through the statewide screening method.[45] Washington's **SB 5489 on Healthy**

38 https://oehha.ca.gov/media/downloads/calenviroscreen/report/cireport123110.pdf; https://www.epa.gov/risk/framework-cumulative-risk-assessment

39 https://oehha.ca.gov/calenviroscreen/about-calenviroscreen

40 https://www.doh.wa.gov/DataandStatisticalReports/EnvironmentalHealth/WashingtonTrackingNetworkWTN/InformationbyLocation/WashingtonEnvironmentalHealthDisparitiesMap

41 https://www.mass.gov/info-details/environmental-justice-communities-in-massachusetts

42 http://ceed.org/ej-story-maps/

43 https://regionalchange.ucdavis.edu/news/ceva-san-joaquin-valley

44 https://legislation.nysenate.gov/pdf/bills/2019/S6599

45 https://calgreenzones.org/wp-content/uploads/2018/09/CEJA-CES-Report-2018_web.pdf

Environments for All directs state agencies to adopt a cumulative impact analysis tool to identify highly impacted communities.[46] New York City's **Environmental Justice Study bill** requires the city to identify environmental justice areas within the city and to create a public online map of the areas and create recommendations for legislation, policy, budget initiatives, and other measures to address environmental concerns affecting environmental justice communities.[47]

1.2 Require analyses of climate and air quality impacts in overburdened communities. Because so many clean energy policies are at the state and national level, detailed data on the impacts of climate change and air quality at the localized level are very important and can result in significant and useful policy recommendations. For example, California's **Renewable Portfolio Standard** required a study on the barriers and opportunities to increase renewable energy and energy efficiency programs within disadvantaged communities.[48] California's governor also directed state agencies to produce an annual report on the benefits and impacts of GHG emissions limits within disadvantaged communities, to be updated at least every three years.[49]

1.3 Require climate policies to include air quality benefits and protections in overburdened communities. Climate policies should include explicit goals to achieve air quality and public health co-benefits in overburdened communities, as well as explicit language to safeguard against disproportionate impacts. California's **100-percent renewable energy bill** explicitly outlines the need to improve air quality in disadvantaged communities.[50] California's **AB 32**, the first major climate change law in the nation, also included several specific protections for overburdened communities, such as: 1) requirements that do not disproportionately impact low-income communities; 2) implementation that considers overall societal benefits and the potential for direct, indirect, and cumulative emission impacts from any market-based mechanisms, especially for already-burdened communities; and 3) assurances that any market-based mechanism prevent increases in toxic air contaminants or criteria air pollutants.[51] It should be noted that these examples from California, while some of the first of their kind, are still vague and have come with their own set of challenges in practice.

1.4 Direct regulatory agencies to identify and adopt all feasible measures that reduce GHGs, criteria pollutants, and toxic air contaminants in disadvantaged communities. With such a large potential for co-benefits across climate and air quality issues, regulatory agencies should seek to identify measures that can achieve the benefits of reducing air contaminants as well as GHGs. For example, California's **AB 197** directs state agencies to prioritize "emission reduction rules and regulations that result in direct emission reductions at large stationary sources of greenhouse gas emissions sources and direct emission reductions from mobile sources."[52]

1.5 Require compatible databases for air quality and GHG emission tracking and reporting. Greenhouse gas and air contaminant reporting should utilize compatible databases that include shared identification numbers for all facilities reporting. These databases should be understandable to community members. For example, California's **AB 617** requires the statewide regulatory agency to establish a uniform statewide system of annual reporting on emissions of criteria pollutants and toxic air contaminants for stationary sources. However, such reporting systems still have a long way to go in in terms of accuracy of measurements and the inclusion of toxic sources.

46 http://lawfilesext.leg.wa.gov/biennium/2019-20/Pdf/Bill%20Reports/House/5489-S2%20HBR%20APP%2019.pdf

47 https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=1805815&GUID=8901A89B-078E-4D47-88D8-EA3E48E715A1

48 https://www.energy.ca.gov/sb350/barriers_report/

49 https://oehha.ca.gov/media/downloads/environmental-justice/report/oehhaab32report020217.pdf

50 https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100

51 https://www.arb.ca.gov/cc/docs/ab32text.pdf

52 https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB197

2. Target the dirtiest sources: Policies for stationary sources

2.1 Expedite technology-based standards. These standards require the use of certain technologies to ensure facility-based emissions are as clean as feasibly possible. The type of technology requirements depends initially on whether the pollutant is classified as a "criteria" air pollutant or a "hazardous" air pollutant. Technology-based standards, applied under the jurisdiction of the Clean Air Act, were the backbone of the **Clean Power Plan**.[53] The Clean Air Act establishes technology-based emission standards for both criteria and hazardous air pollutants. For criteria air pollutants, sources can be required to meet different standards, including "Best Available Control Technology" and "Lowest Achievable Pollution Rate," depending on the size of the source, whether it is a new or modified source, and where the source is located. Sources located in areas not meeting ambient air requirements are generally required to meet more stringent requirements. Sources of a certain size that emit any of the 187 hazardous air pollutants are required to meet similar but different requirements, including a requirement called "Maximum Available Control Technology."[54] Unfortunately, the application of these standards is often uneven, and different jurisdictions may use different standards.

2.2 Strengthen performance standards. Performance standards set an emission standard that all regulated entities must meet, without prescribing how an entity should achieve the standard.[55] For example, the Clean Air Act has **New Source Performance Standards**, which are nationally uniform, technology-based standards that establish a consistent baseline for pollution control for all regulated entities for large stationary sources.[56] The benefit of a technology standard is that it does not require the complicated determination of a facility-by-facility emission reduction target, which can vary widely across industries, polluters, and even types of contaminants. Performance standards are commonly used to ensure that the amount of pollution per kilowatt per hour from power plants is below a certain level. For example, **Washington's performance standard for power plants** requires new plants to emit greenhouse gas at a rate of no more than 1,100 pounds per megawatt-hour.[57] In order to effectively reduce emissions, these standards often need to be updated and strengthened.

2.3 Establish facility-level co-pollutant caps or GHG caps. This requirement would cap a facility's GHG or co-pollutants at a set level. A facility-level GHG cap would ensure that certain facilities do not increase production and emissions above a certain value, operating under the assumption that by controlling GHG emissions, co-pollutant levels are also controlled. A co-pollutant cap would ensure that co-pollutants do not increase. **Hawaii** requires large existing stationary sources to reduce GHG emissions 16 percent below actual baseline levels, and each affected source must submit a plan for establishing measures that will be used to meet the emission cap.[58]

Certain co-pollutants may require their own set of regulations and standards. **Box 3A** describes policy and regulation options for methane, one of the most potent short-lived climate pollutants.

53 https://www.c2es.org/content/regulating-industrial-sector-carbon-emissions/

54 https://www.everycrsreport.com/reports/RL30853.html

55 https://climatepolicyinfohub.eu/non-market-based-climate-policy-instruments

56 https://www.everycrsreport.com/reports/RL30853.html#_Toc480973756

57 https://ecology.wa.gov/Air-Climate/Air-quality/Business-industry-requirements/GHG-standards-for-power-plants

58 http://health.hawaii.gov/cab/hawaii-greenhouse-gas-program/

Box3A:
Methane regulation for oil and gas operations

The urgent need to eliminate methane has only more recently gained recognition. Methane is the largest constituent of natural gas. Oil and gas operations emit methane by venting or combustion or through leaks, such as those in utility lines. Coal mines, gas storage facilities, and pipeline leakages also release large quantities of methane. Recent studies have shown that methane leaks are 60 percent higher than estimated by the U.S. Environmental Protection Agency.[59] While phasing off both natural gas and other fossil fuels is the long-term solution needed, short-term policy solutions to reduce methane from oil and gas fall into several main categories:

Overall regulation of methane

- **Establish a goal for methane reductions.** For example, **Massachusetts** has imposed annually declining methane emission limits on natural gas distribution system operators.[60] **California** set a goal to cut methane and hydrofluorocarbon gases by 40 percent and black carbon (soot) by 50 percent below 2013 levels by 2030.[61] **Colorado** recently adopted a bill to update their oil and gas regulations, creating a comprehensive approach to methane regulation that increases requirements to address leaks, prioritizes health and safety in permitting, increases the authority of local governments to regulate oil and gas operations, and re-vamps the regulatory board in charge of oil and gas regulation to have a stronger focus on environmental health and protection.[62]

Increased regulations on oil and gas operations

- **Require oil and gas companies to find and fix methane leaks and to install equipment to capture most of the emissions. Colorado** was the first state to enact this kind of broad methane regulation.
- **Restrict methane venting and flaring.** A 2016 EPA regulation restricted methane venting and flaring by creating new performance standards for oil and gas operators on public and tribal lands, but this requirement was rolled back by the Trump administration in 2018.[63] Now in 2021, the Biden administration hopes to restore methane regulation to even stricter standards than in 2016.[64]

Increased requirements for utilities to stop natural gas leaks and improve storage

- **Require regular methane leak inspections.** Inspections should be carried out across the supply chain, including underground storage, pipes, processing plants, and well heads.[65]
- **Require utility companies to fix all leaks in pipelines.** Repairs should not just address leaks that are deemed hazardous, which is the *de facto* requirement. In 2019, **Massachusetts** passed a regulation that requires utilities to identify these "super leaks"—and repair them within two years.[66]

Overall, however, we need a transformation beyond gas through decarbonizing homes while keeping energy bills affordable. This approach will help phase out our reliance on planet-warming and health-damaging gas infrastructure.

59 https://pubs.acs.org/doi/full/10.1021/acs.est.6b00705

60 https://www.usclimatealliance.org/slcp

61 https://www.c2es.org/content/short-lived-climate-pollutants/

62 https://leg.colorado.gov/bills/sb19-181

63 https://www.kirkland.com/siteFiles/Publications/Recent_Developments_in_the_Regulation_of_Methane_Venting_and_Flaring_from_Natural_Gas_Wells_on_Public_and_Tribal_Lands_and_Potential_Next_Steps.pdf; https://www.nytimes.com/2018/09/18/climate/trump-methane-rollback.html

64 https://www.npr.org/2021/11/02/1051302469/biden-proposes-new-rules-to-cut-climate-warming-methane-emissions

65 https://insideclimatenews.org/news/10022016/california-new-methane-rules-would-be-nation-strongest-oil-gas-aliso-canyon

66 https://www.wbur.org/earthwhile/2019/04/01/natural-gas-methane-leaks-massachusetts-rule

3. Clean up how we move: Policies for mobile sources

Note: Many additional mobile source air quality measures are covered in the policy brief on Electrifying Transportation.

3.1 **Adopt an ISR (Indirect Source Rule) for major area-wide sources of emissions.** In the regulatory context of air quality, an ISR applies to facilities that attract mobile traffic sufficient to cause violations that exceed air quality standards, such as large freight facilities including ports, railyards, warehouses, and distribution centers. These sources, which typically do not fall under standard air quality regulations, are often drivers of air contamination and related health impacts in communities of color as well as major emitters of GHGs.

An ISR holds developers and operators of these facilities responsible for the traffic-related emissions coming into their facilities and requires them to implement various mandatory measures and regulations to reduce emissions. In the long term, the vehicles coming into and leaving these facilities must be electrified and land-use planning shifted to prevent the creation of new area sources, such as the construction of new warehouses. However, an ISR is an important part of reducing immediate, and harmful, air quality impacts. In other words, ISRs can help minimize the amount of pollution released by the thousands of trucks and ships going in and out of depots and ports every day.

An ISR can be complicated to implement because of the many sources involved, and facility operators can claim they are not responsible for pollution from vehicles. In the case of railyards, state jurisdiction is limited to intrastate locomotives; trains moving across state boundaries fall under federal authority. The **South Coast Air Quality Management District of California** has an ISR for large warehouses, requiring operations to implement a range of mitigation measures to reduce emissions and air pollutants.[67]

The "indirect source rule" (ISR) refers to whether the facility is directly or indirectly owned by the polluter. It is primarily used in air quality regulation to provide different incentives and rules to different actors. This concept is not the same as direct vs. indirect emissions. An ISR is applied to polluting hubs that congregate mobile sources emitting direct emissions and, therefore, decreases in pollution at these facilities directly benefit nearby local communities.

67 https://www.aqmd.gov/docs/default-source/news-archive/2021/board-adopts-waisr-may7-2021.pdf

3.2 Increase funding for innovative clean transit programs serving rural communities. Rural communities face unique mobile source challenges because of the long distances between many locations and the lack of public transportation options. Statewide clean transportation policies should support innovative clean transit programs and pilot projects that can reduce vehicle emissions and air pollutants while meeting the transportation needs of rural communities. One example is dedicated funding for clean shared-mobility pilot projects for rural communities, such as van pooling and ride sharing.

For example, in several isolated rural communities in **California's Central Valley**, local government and community-based organizations have worked together to fund the purchase of electric rideshare vans and to create a dispatch system to connect riders with the driver.[68] Another small town in the Central Valley has a ***Green Raiteros*** **(Green Riders) program**, which is helping the informal, individual ridesharing networks become more systematized and also purchasing electric vehicles for drivers.[69] The State of Washington has one of the largest **Vanpool Grant programs** in the country, and there are more than 2,400 vanpools in the Puget Sound Region active every day.[70]

3.3 Increase funding and planning mandates for equitable, clean public transit. Clean, affordable, and accessible mass transit is critical to reducing climate change and improving air quality. It is one of the most impactful ways to reduce our reliance on energy-intensive cars while offering a wide range of social and health benefits—including cleaner air—to low-income, frontline, or BIPOC communities, especially because these communities are least likely to own a private vehicle.

States should prioritize expanding and building new public transit projects that reduce GHGs and serve low-income communities and communities of color. In the United States, this issue can be complex because it intersects with land-use, transportation, air quality, and climate planning. Achieving clean public transit systems that serve low-income communities requires fundamental shifts in how cities and communities are planned and built, as well as major changes in public revenue allocations. The intersections with land use and electrification are discussed more in-depth in the Equity Fund's policy briefs on transportation.[71] In essence, transportation planning that prioritizes the most vulnerable and marginalized communities is a critical piece of building clean and healthy communities and, ultimately, clean air for all.

A few of the policy solutions to expand equitable, clean public transportation options include the following.

3.3.1. Create equity-focused public transit criteria or priorities within existing transportation funding allocations and planning processes. Some sources of transportation funding can be earmarked to prioritize public transportation in low-income communities. For example, the **SF Metropolitan Transit Agency** has developed an "Equity Strategy" to improve bus service in low-income neighborhoods.[72] The California climate investments include a mandatory set aside of 35 percent total for disadvantaged and low-income communities, as well as dedicated funding for particular programs, such as the Transit and Intercity Rail Capitol Program.[73] Other policy solutions include requiring transit agencies to include criteria on access and transit ridership in planning and grants. The **Virginia Department of Transportation** created a

68 https://www.governing.com/news/headlines/gov-eco-friendly-rideshare-cantua-creek-rural-california-unincoporated.html

69 https://cal.streetsblog.org/2018/10/25/greening-the-heart-of-the-central-valley/

70 https://www.wsdot.wa.gov/transit/rideshare/vanpool

71 The Equity Fund's policy briefs on transportation can be found on our website: https://www.theequityfund.org/policy-accelerator.

72 https://www.sfmta.com/projects/muni-service-equity-strategy

73 https://ww3.arb.ca.gov/cc/capandtrade/auctionproceeds/ccidoc/tircp_082718_ada.pdf

prioritization program for transportation projects that includes explicit criteria on environmental sustainability, as well as access for low-income individuals and efficiency of land use.[74] The **City of Minneapolis** also conditioned transportation capital spending through a set of criteria in which nearly 50 percent of possible points are awarded based on concentration of people of color, low-income populations, low vehicle-ownership, and overall population density.[75]

Similar equity-focused considerations must be elevated at the federal level. The Biden administration's **Justice40 Initiative** provides one avenue to increase targeted investments for critical infrastructure such as public transit.[76] Without federal-level support, state-level action may come up against significant roadblocks as statewide sources of transportation revenues face legal limits on spending. Advocates should always research the state specifics in crafting relevant policy solutions.

3.3.2. Require clear goals and increase funding for public transit access and affordability for low-income public transit users and other vulnerable communities. Improving service availability and reliability increases public transit ridership and, thus, reduces personal vehicle travel. However, many public transit systems do not provide adequate service necessary to ensure they are reliable sources of transportation for everyday needs. In many states, public transit is under-funded, under-prioritized, or relies on aging infrastructure. State agencies can set goals for expanding service levels within public transit systems, such as identifying a minimum percentage of the population with access to public transit, improving accessibility for target populations (such as low-income communities, seniors, youth, or people with disabilities), as well as agency planning for increased investments across all modes of public transit.

3.3.3. Create fare assistance programs for low-income public transit users and other vulnerable communities. Programs that provide free or low-cost fare passes for low-income, youth, or other vulnerable populations can ensure access to transportation as well as increase public transit ridership. Multiple cities offer reduced-fare programs for low-income residents, such as **Los Angeles, Portland, the Twin Cities (Minneapolis–Saint Paul),** and **Seattle**. Programs should avoid no-cash policies, as these tend to hurt those without access to banking and credit the most.

3.4 Incentivize best practices for railyards, ports, heavy-duty trucks, and other freight infrastructure. While not as effective as directly reducing emissions, reducing exposure to pollution from freight transport is a great way to improve the air quality for environmental justice communities. This approach could use strategies like changing truck routes, creating buffer zones, reducing idle time, and replacing older trucks with newer, more efficient models.[77] Such actions should not take the place of efforts to reduce emissions, but can serve as a starting point for cleaner freight-wide planning. Ports in **Baltimore, Los Angeles, Long Beach, Georgia,** and **New York–New Jersey** all have clean truck programs to improve air quality through truck replacement and/or reduced idling.[78]

74 http://smartscale.org/about/default.asp

75 http://transitcenter.org/wp-content/uploads/2018/07/Inclusive-1.pdf

76 https://www.whitehouse.gov/omb/briefing-room/2021/07/20/the-path-to-achieving-justice40/

77 https://www.epa.gov/ports-initiative/best-clean-air-practices-port-operations

78 https://www.epa.gov/ports-initiative/drayage-truck-best-practices-improve-air-quality

3.5 Adopt California vehicle fuel efficiency standards. Fuel standards mandate how far one can travel on a tank of gas, thus increasing efficiency and reducing GHG emissions. While there is a national **Corporate Average Fuel Economy (CAFE) vehicle standard**, which sets minimum vehicle performance levels, California adopted more strict standards established by the **California Air Resources Board (CARB)**, and states are allowed to adopt the California standards if they choose. Currently, 13 other states and the District of Columbia follow the CARB standards, representing nearly 40 percent of new vehicles sold in the United States. In 2012, President Obama issued revised and strengthened standards, which would have doubled the average fuel economy of passenger vehicles to the equivalent of 54.5 miles per gallon by 2025, but the Trump administration halted the implementation of these standards.[79] The Biden administration is now in the process of restoring states' rights to re-establish the standards.

3.6 Ban or restrict the sale or use of internal combustion engines. These policies reduce the amount of gas-powered vehicles on the road by banning or restricting the sale of internal combustion engines (ICEs). Sixteen countries have taken action to phase out the sale of ICE vehicles on various timelines, but these goals have all been non-binding.[80] Policies can also restrict the registration of new or used internal combustion engines. For example, **Tokyo** has banned vehicles that do not meet emission standards that reduce smog.[81] Some cities are restricting the areas where ICE vehicles can be driven through the creation of "low emission zones," placing limits on diesel vehicles in particular. In **Paris**, older diesel cars are gradually being banned from the city, and by 2030, only low-emission vehicles will be allowed in the center city area.[82]

3.7 Create a low-carbon fuel standard. A fuel standard entails a standard on the carbon intensity of all fuels sold by a distributor for transportation use. Fuel standards generally allow the regulated companies to purchase credits for fuels with lower carbon intensity (blended fuels, electricity as fuel) to balance their higher-intensity products. In doing so, they can spur markets for alternative fuels, but this trade does not create a transition off gasoline by itself. The alternatives often include fuels such as renewable natural gas or biomethane that are not fully renewable or have other negative environmental impacts. A fuel standard focuses on lowering per vehicle pollution and is therefore relative. If the number of vehicles continues to increase, it does not necessarily lead to lower fuel consumption overall. Both **Oregon** and **California** have laws that put a limit on the lifecycle carbon intensity of oil distributors.

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80 https://climateprotection.org/wp-content/uploads/2018/10/Survey-on-Global-Activities-to-Phase-Out-ICE-Vehicles-FINAL-Oct-3-2018.pdf

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