# LINKED FATES

## How California's Oil Imports Affect the Future of the Amazon Rainforest

State and Corporate Leaders can Chart a New Path

AMAZON WATCH

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# EXECUTIVE SUMMARY

## Our Linked Fates

This groundbreaking investigative report tracks crude oil from the Western Amazon to the U.S. – revealing that California refineries, businesses, and consumers are playing an outsized role in consuming oil from one of the most biodiverse regions in the Amazon Basin. Despite its progressive image and leadership, there is no other region in the world consuming more oil from the Amazon than California. 50% of all the oil drilled and exported from the Amazon goes to California; half of this goes to 3 refineries in the Greater Los Angeles area alone. Through this supply chain, several corporations with major markets in California are connected to oil drilling in the Amazon – including American Airlines, COSTCO, Amazon.com, Fedex, UPS, Pepsi, Albertsons, Kroger, and many others.

As California is beginning to address its domestic oil industry and the impacts on fenceline communities and spills along its coasts, Indigenous communities in Ecuador, Peru, and Colombia, who have also endured the oil industry's toxic legacy, are calling for an end to the expansion of the oil industry into their territories. The experiences of these impacted communities presage our larger linked fate – that fossil fuel expansion leads to climate disaster that affects all our communities. California has an imperative to act to protect the Amazon by eliminating its dependency on Amazon oil as part of a climate smart strategy to wind-down demand for fuel production and create a just transition away from fossil fuels. Oil expansion is not compatible with the scientific mandate to limit global warming to 1.5º C under the Paris Climate Agreement; nor is it aligned with the IEAs recommendation to halt global oil and gas expansion by the end of 2021. State and corporate leaders must chart a path away from fossil fuels, including oil extracted in the Amazon, towards a just transition that is good for the global community.

**50% of all the oil drilled and exported from the Amazon goes to California; half of this goes to 3 refineries in the Greater Los Angeles area alone.**


Photo - An Achuar community in Peru marches in protest of PetroPeru's operations, 2013. ©Amazon Watch

## The Oil Flow

The U.S. is the largest global consumer of oil extracted from the Amazon Rainforest. 89% of the crude oil exported from the Amazon comes from Ecuador and 66% goes to the U.S. In California, where the majority of this oil is refined, an average of **1 in 9 gallons of gasoline, jet fuel, and diesel pumped in the state comes from the Amazon Rainforest.** In Southern California, the volume goes up to 1 in 7 gallons.[2]

Marathon, Chevron, and Valero are the top 3 refiners of oil from the Amazon, all in California. Of the Amazon crude that goes to the U.S., 27% goes to Marathon, 22% goes to Valero, and 17% goes to Chevron.

Los Angeles International Airport consumes more oil from the Amazon than any other airport in the world – an average of 1 in 6 gallons of jet fuel pumped at LAX comes from the Amazon.


123 MILLION GALLONS of jet fuel from the Amazon Rainforest was consumed by major airlines at LAX and SFO in 2020. The top airlines are American Airlines, Delta, United, Southwest, Alaska Airlines.


13 MILLION GALLONS of diesel from the Amazon Rainforest was consumed by food and beverage delivery services in 2020. The top companies are Pepsi, Sysco, U.S. Foods, Reyes Holdings, and UNFI.


39 MILLION GALLONS of diesel from the Amazon Rainforest was consumed by parcel delivery services in 2020. The top companies are Amazon.com, UPS, and FedEx.


43 MILLION GALLONS of diesel and gasoline from the Amazon Rainforest was consumed by major supermarkets for their fleets and retail fuel stations in 2020. The top supermarkets are Walmart, Costco, Kroger, and Albertsons/Safeway.


1.9 BILLION GALLONS of gas and diesel from the Amazon Rainforest was sold by major oil companies in California in 2019. The top retailers include Arco, Chevron, Shell, 76 (Phillips 66), and Valero. Unbranded gas is the largest share of gas sold in the state, illustrating that real change will require state action to reduce gasoline consumption, not just actions by brands.



## The Flying River

The Amazon Rainforest, like all forests, takes up water and releases it into the atmosphere in such volume that the flow of moisture in the air is called a flying river. Up to 70% of this water comes from plants.[1]

Like rivers, the flying river transports water locally and regionally, and even to other continents through prevailing winds.[2] Deforestation and climate change are drying up these important conduits. As the flow of water from plants into the air declines, rainfall is reduced. Some models have shown the impact of this reduction as far north as the Sierra Nevadas, suggesting that Amazon forest destruction could expose California to more severe droughts and fires.

As the Amazon is logged, burned, and converted to other land uses, the biome is reaching a tipping point, causing the tropical forest to transition to grassland. Leading scientists have found that in order to avert crossing this point, 75-80% of the biome must remain intact.

This is why Indigenous leaders are calling for protecting 80% of Amazonia by 2025. They led the successful effort to pass and adopt Amazon Tipping Point Motion 129 at the IUCN World Conservation Congress in September 2021 and it will now shape global policy on the Amazon. Indigenous federations and allies are calling for a range of solutions including the creation of Amazon Biome Emergency Action plans, support for territorial land titling and defense and co-management of protected areas, and a moratoria on the expansion of industrial extraction including fossil fuels, mining, and deforestation driver commodities.

Photo - The Capahuari river runs through Achuar Indigenous territory in the Ecuadorian Amazon. ©Amazon Watch/Caroline Bennett

**“The Amazonian territories and ecosystems that we have lived in harmony with for millenia are under dire threat. We are at a tipping point. It’s now or never. We need to ensure protection of 80% of the Amazon rainforest before 2025 or we risk planetary peril. No one knows how to better protect these forests than we do, and the world should support and follow our lead.”**

– **Gregorio Mirabal,** Executive Coordinator of the Coordinating Body of Indigenous Organizations of the Amazon Basin (COICA)

### The Last Place on Earth for Oil Extraction

Millions of hectares in the Western Amazon are now under imminent threat due to the expansion of fossil fuel production into this largely intact rainforest. With 90% of Amazonian oil exports coming out of Ecuador, this region is a critical hotspot. In hopes of boosting its economy and meeting demand by consumers like California, the Ecuadorian government has announced plans to double oil production – putting millions of hectares of primarily roadless, intact rainforest at risk.

Oil drilling requires roads and infrastructure that fragment the rainforest. Deforestation along roadsides is a well-documented driver of forest loss and there is a strong positive correlation between oil drilling and deforestation in the Ecuadorian Amazon.[3,4] Ecuador has one of the highest road densities of the Amazon basin and the deforestation and colonization threatens Indigenous ways of life and food sovereignty security, as well as cultural and spiritual practices.[5] Land-use change from agriculture is the number one cause of deforestation in Ecuador and the greatest concentration of forest loss due to these practices overlaps with the three most active oil blocks in the country.[6]

## The Threat to Indigenous Peoples' Lands and Cultures [4]

The rainforests of the Western Amazon hold the headwaters of the Amazon river and are home to over 600,000 Indigenous people, including those living in voluntary isolation. Oil extraction and deforestation lead to violations of Indigenous peoples' rights and are existential threats to their survival. Many Indigneous peoples have explicitly and repeatedly voiced their opposition to the expansion of oil and other industrial activities in their territories. The oil industry is pushing deeper and deeper into Indigenous territories and frontier rainforests. In Yasuní National Park in Ecuador, the traditional territory of the Waorani Indigenous peoples, a UNESCO Biosphere Reserve, and one of the most biodiverse places on the planet, there are eight oil blocks, and plans to drill over 600 new wells. Construction on a road inside the park to open new wells is now less than 1300 feet (400 meters) away from the "no-go" zone designed to protect Indigenous peoples' territories. The road development and the oil expansion represent a genocidal threat for the Tagaeri and Taromenane, Ecuador's last Indigenous peoples living in isolation. Ecuador's national and Amazonian Indigenous confederations CONAIE and CONFENIAE respectively, with the Waorani, and civil society organizations recently filed suit against the government, calling the expansion a "policy of death".

Photo -
©INREDH Foundation

**"Our basic right to Free, Prior and Informed Consent (FPIC) continues to be violated by oil drilling projects, as is our right to a healthy environment, Indigenous autonomy, and the rights of nature, all of which are guaranteed by our constitution. There is no current drilling that complies with UN standards on the Rights of Indigenous Peoples. We are adamantly opposed to new oil extraction. And when we raise our voices and exert our rights, we are criminalized, persecuted, and are threatened."**

**– Marlon Vargas,** President of the Confederation of Indigenous Nationalities of the Ecuadorian Amazon (CONFENIAE)



## The Ongoing Toxic Legacy

Oil extraction in the Western Amazon is a significant source of soil, water, and air pollution, especially for local and Indigenous communities. For example, Chevron is connected to some of the oil industry's worst impacts in the Amazon and has spent nearly $2 billion fighting its court-ordered mandate to pay $9 billion in clean-up and community reparations costs that it is responsible for in Ecuador. Hundreds of open oil pits still drain into the water supply, impacting surrounding communities and the health of the forest and rivers.[5]

Pipelines carry crude oil hundreds of miles from the Amazon, up over the Andes, to the Pacific Coast. These pipelines have a long history of ruptures and spills that contaminate rivers and disrupt the life, health, and food sovereignty of Indigenous communities.

An April 2020 pipeline rupture contaminated hundreds of miles of two major rivers in the Ecuadorian Amazon and impacted tens of thousands of Indigenous peoples who depend on these rivers to survive. The Indigenous movement is calling for an end to all new extraction, planned expansion, and new exploration, as well as a moratorium on current crude production until remediation of contaminated sites occurs and future spill risk is assessed and mitigated, and there is a commitment to phase out fossil fuels.

Photo -
©Amazon Watch

Flaring from oil wells pollutes the air and has led to a spike in respiratory illnesses. Pollution is also harming the fish and animal life that are staples in culture and local diets, leading to food insecurity and bioaccumulation of heavy metals in animals and humans alike, which also contribute to cancer rates and other illnesses.

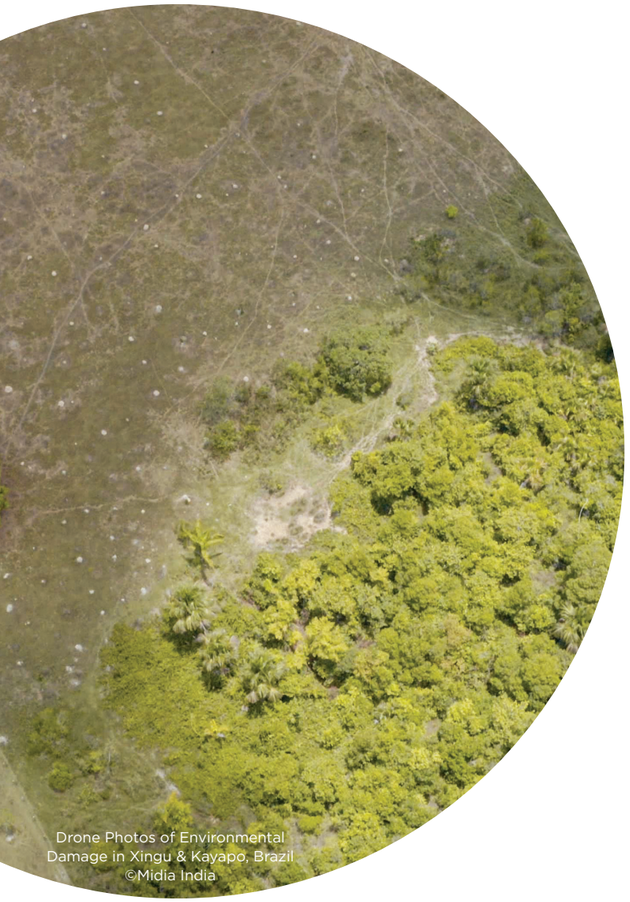
**"Oil drilling in our Amazon has brought contamination, disease, deforestation, destruction of our cultures, and the colonization of our territories. It is an existential threat for us and violates our fundamental rights as Indigenous peoples. We are calling for an end to all new extraction on our lands, and as our ancestors and science now affirm, we must keep fossil fuels in the ground, in accordance with the commitments of the Paris Agreement and at COP 26 in Glasgow."**

**– Nemo Andy Guiquita**, Waorani Indigenous leader and Director of Women and Health for the Confederation of Indigenous Nationalities of the Ecuadorian Amazon (CONFENIAE)

## The Solutions

Companies using Amazon oil are responsible for eliminating fossil fuels, including those destroying the Amazon Rainforest. Corporate leaders need to:

- **Call for no new oil expansion in the Amazon**
- **Develop fuel sourcing policies that are transparent and traceable**
- **Set aggressive goals for electric vehicle use and other strategies designed to reduce fossil fuel consumption**[6]



Drone Photos of Environmental Damage in Xingu & Kayapo, Brazil ©Midia India

**Government Leaders Need to be a Force for Change**, with new policies, regulations, and commitments:

- **Commit California to a policy/regulatory agenda that ensures that California is not contributing to the expansion of oil drilling in the Amazon.**
- **Create a multi-agency commission to map out how the state can achieve this goal (without any increase of domestic Californian production)**
- **Present a plan for California to reduce and/or eliminate its consumption of crude from the Amazon.**
- **California commits to new fuel efficiency standards, push for electrification of fleets that consume the most Amazon oil, expansion of EVs broadly, and public transportation goals to reduce domestic consumption equivalent to Amazon oil import totals.**
- **No new domestic production or within 3200 feet of buffer areas**

This is a critical moment in California. Will state and corporate leaders take bold and tangible steps to ensure that the state doesn't continue to drive oil expansion in the Amazon? These leaders need to make eliminating Amazon oil a key climate action and support the offset of fuel demand in the state. The fates of California and the Amazon are intertwined, and the future of hundreds of thousands of Indigenous peoples and millions of acres of Amazonian rainforests hangs in the balance.



## TABLE OF CONTENTS

# INTRODUCTION

## California: A Paradox of Progressive Climate Vision and Massive Oil Consumption

California is the largest destination for oil exports from the Amazon Rainforest, receiving (on average) 50% of the crude oil extracted from the Amazonian regions of Ecuador, Colombia, and Peru each year.[7] In 2020, Ecuador surpassed Saudi Arabia as the largest foreign source of oil imported into California's oil refineries. This report, the result of a two-year research project tracking the flow of oil, its impacts on the Amazon, and its refining and consumption in the U.S., reveals that:

- The U.S. is the largest global consumer of oil extracted from the Amazon Rainforest;
- California alone accounts for approx. 50% of the global exports of Amazon oil and in 2020 half of that went to 3 refineries in the Greater LA area: Chevron El Segundo, Marathon Los Angeles, and Valero Wilmington.
- In 2020, 1 in every 9 tanks of gas, diesel, or jet fuel pumped in California came from the Amazon Rainforest, mostly for retail gasoline;
- In Southern California, the figure is approximately 1 in 7 gallons;
- At Los Angeles International Airport, 1 in every 6 gallons of jet fuel is Amazon rainforest derived, making the airport and its top airlines some of the biggest users of Amazon oil in the World.

California consumes more crude oil annually than the United Kingdom. If it were a country, it would be the 13th largest consumer of crude, just behind Iran. Californians also travel by car more than any other state. In 2019 (the last year tallied) they logged more than 340 billion miles.[8] Based on the Californian fleet fuel consumption average of 22.6 miles per gallon (mpg), they consumed approximately 15 billion gallons of gasoline.[9] To give some perspective, it would take 2 billion tree seedlings planted today 10 years to sequester the carbon from these 2019 emissions alone.[10] 1.6 billion gallons of the gasoline consumed in the state in 2019 was derived from crude oil extracted in the Amazon Rainforest, where almost 1 billion barrels of oil have been exported since 2014.[11] On average, 89% of this oil is exported from Ecuador.[12]



Photo - San Carlos, Ecuador, a community based around petroleum production and facing one of the highest cancer rates in Ecuador. ©Amazon Watch

**One in every 9 tanks of gasoline, diesel, or jet fuel pumped in California comes from the Amazon.**

Each refinery's utilization of Amazon oil is different, but across the state Amazon crude oil is around 10.8% of all crude oil inputs to California refineries. These refineries predominantly produce gasoline, diesel, and jet fuel. Using common conversion factors for crude oil to refined petroleum products, this translates to an Amazon-derived refined product production rate of 11.6% across the state. That means that, on average, one in every 9 tanks of gasoline, diesel, or jet fuel pumped in California comes from the Amazon, a rainforest with cultural and biological diversity of such largess that it has routinely been cited as the richest natural region on the planet.[13]

California's out-sized role in the consumption of oil from the Amazon means that the state has an imperative to act to protect the Amazon by eliminating its dependency on Amazon oil as part of a climate smart strategy to wind-down demand for fuel production and create a just transition away from fossil fuels. Oil expansion in the Amazon causes deforestation, pollution, biodiversity loss, infringement of Indigenous peoples rights, and corruption. It is also not compatible with the scientific mandate to limit global warming to 1.5º C under the Paris Climate Agreement; nor is expansion aligned with the International Energy Agency's recommendation to halt global oil and gas expansion by the end of 2021.

**Californian and Amazonian Communities Intertwined**

Burning Amazon oil releases millions of metric tons of carbon dioxide into the air, contributing to the warming of the earth's atmosphere, which in turn increases the chances of devastating forest fires both in California and in the Amazon. Some models even predict that the complete deforestation of the Amazon rainforest could change rainfall patterns in the Sierra Nevada, reducing rainfall by up to 20% and markedly reducing snowpack.[14] These climate models suggest a relationship between the Amazon and California – a feedback loop where forests in the two localities may be inextricably linked.

The risk that Amazon destruction could compound the forest fire risk for Californians suggests a connectedness, or linked fate, through the global impacts of climate change. But Amazonian communities and Californian communities are also linked through similar struggles to address pollution and rights related to oil infrastructure. Communities close to oil and gas infrastructure are more negatively impacted by oil extraction, refining, transportation, and storage and these communities are most often black, Indigenous, and peoples of color. They are also lower-income and less able to move away from sources of pollution and avoid impacts on their health and well-being.

**The Amazon is the Last Place in the World Oil Drilling Should be Expanding**

The Amazon Rainforest takes up water and releases it into the atmosphere in such volume that the flow of moisture in the air is called a flying river. Like rivers, the flying river transports water locally and regionally, and even to other continents through prevailing winds.[15] Up to 70% of this water comes from plants, and so forest loss from deforestation and climate change are drying up these important conduits.[16] As the flow of water from plants into the air declines, rainfall is reduced. As the Amazon is logged, burned, and converted to other land uses, the biome is reaching a tipping point, causing the tropical forest to transition to grassland. Leading scientists have found that in order to avert crossing this point, 75-80% of the biome must remain intact.

This is why Indigenous leaders are calling for protecting 80% of Amazonia by 2025. They led the successful effort to pass and adopt **Amazon Tipping Point Motion 129** at the IUCN World Conservation Congress in September 2021 and it will now shape global policy on the Amazon. Indigenous federations and allies are calling for a range of solutions including the creation of Amazon Biome Emergency Action plans, support for territorial land and defense and co-management of protected areas, and a moratoria on the expansion of industrial extraction including fossil fuels, mining, and deforestation driver commodities.

The Amazon rainforest's immense bio-cultural diversity and importance for global climate stability make this region a critical global priority area that must be safeguarded. Unfortunately, in the Western Amazon and Ecuador in particular, the exact opposite is happening. Ecuador is reeling from decades of cycles of colonial-style oil development that has enriched foreign companies, created an industry rife with corruption, and left the country hugely in debt. In an effort to use the poison as a cure, Ecuador's new president Guillermo Lasso plans to double oil production.[17] Approximately 7.5 million acres (3 million ha) of intact forests are slated to be auctioned off in 2022. In Yasuní National Park, the traditional territory of the Waorani Indigenous peoples, a UNESCO Biosphere Reserve, and one of the most biodiverse places on the planet, there are eight oil blocks and plans to drill over 600 new wells.

The construction of a road inside the park to open new wells is now less than 1300 feet (400 meters) away from the "no-go" zone designed to protect Indigenous peoples' territories. The road development and the oil expansion represent a genocidal threat for the Tagaeri and Taromenane, Ecuador's last Indigenous peoples living in isolation.

Aging infrastructure and lack of enforcement of environmental regulations contribute to frequent oil spills, including a major spill in 2020 that left thousands of Indigenous and local peoples without clean drinking water, which has yet to be remediated. The human rights violations of oil and extractive industries operating in the region is a toxic legacy affecting millions of Indigenous peoples in the Amazon basin whose cultural survival depends on intact forests and rivers.

Indigenous peoples' rights, food security, and health are under major threat from the industry's forest fragmentation, oil spills, flaring, dumping of toxic waste and the many cultural impacts that these threats represent. Oil exploration and production contribute to deforestation, threaten the unparalleled biodiversity of the Amazon, and cause pollution. Forest loss and degradation has pushed portions of the Amazon from a net carbon sink to a carbon source, a reversal that has major implications for global warming.[18] Meanwhile burning the crude oil that is extracted releases even more carbon into the atmosphere – 134 million metric tons in 2019. That is the equivalent of the annual carbon emissions from 33 coal-fired power plants.[19]

A reduction in the Californian demand for Amazon oil could be a positive part of a just transition for Amazon communities and Californian communities alike, as long as changes to California's consumption of Amazon oil does not result in more domestic crude extraction or extraction from other localities such as the Alberta tar sands or the Arctic, which would shift the environmental justice problems instead of solving them. By replacing the demand for fossil fuels in the state with electric vehicles (EVs), more energy-efficient transportation, and alternative fuels, Californians could be protecting the Amazon while safeguarding their forests and their communities as well.



# Ecuador's new president Guillermo Lasso plans to double oil production.

**A new approach**

Our research on the supply chains for oil from the Amazon has already shown the urgent need to protect the Amazon from oil expansion. A range of EU banks that were exposed in August 2020 as financing the trade of oil from the Amazon Rainforest (primarily Ecuador to California) have now committed to stop financing those oil flows as these loans violated their Environmental and Social Risk policy frameworks. By extension, a scorecard of the top foreign banks financing and/or investing in the oil industry in Amazon was released in July 2021, leading to the campaign for financiers to Exit Amazon Oil and Gas.

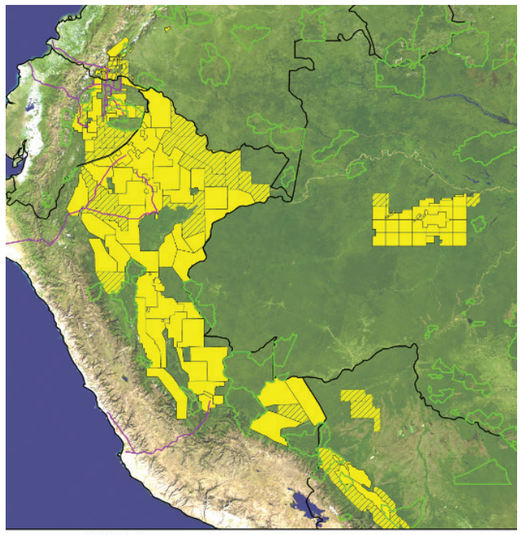
Now this report, the first of its kind, tracks the flow of crude oil from the Amazon Rainforest as it is extracted, transported to port, and exported around the world. It follows the majority of the crude volumes as they flow into U.S. refineries and traces the distribution of the refined product outputs via pipelines and bulk fuel terminals to the sale and consumption of gasoline, jet fuel, and diesel by major corporations. An 'Amazon Rating' based on the proportion of all jet fuel, gasoline, and diesel fuels produced at each refinery that comes from the rainforest is calculated as a means of assessing how much of these corporations' annual fuel consumption totals are linked to rainforest destruction. The study also takes into account the nascent efforts by corporations to decarbonize their businesses, as well as the steps that California and the U.S. governments can take to create a just transition away from Amazon oil.

The result is an analysis that reveals the connection of Amazon crude supply to California and its environmental and social impacts, in hopes of catalyzing new leadership efforts in the U.S. and Ecuador to protect the Amazon, its inhabitants, and our climate.

Drone Photos of Environmental Damage in Xingu & Kayapo, Brazil
©Midia India

# OIL EXTRACTION AND ITS IMPACTS

The study includes four South American countries containing rainforests that are part of the Amazon basin: Ecuador, Brazil, Colombia, and Peru. In each of these countries, there are state oil companies and ministries controlling the allocation of oil resources to block operators, typically through the auction of oil blocks and the provision of service provider contracts where each party is allocated a share of the oil extracted from the block.




Oil blocks are mapped by the government, with the blocks under exploration and those under development clearly marked and the oil block's operator identified. Oil block operators range from recognizable oil majors such as Repsol and BP to smaller exploration and production companies like Gran Tierra, Fronterra, and Geopark. Block operators can also be companies set up uniquely for the block. These are usually indicated as 'consortia' with the partners and their share of the business.

All of the Amazon crude oil exports identified in this study are extracted from the Western Amazon: from Ecuador, Colombia, and Peru. Brazil's oil exports focus on the offshore oil production in the Santos and Campos basins off the southeast coast of Brazil, in the 'Pre-salt' region. While that is the current trend, across the Amazon biome 9.4% of the landbase is in delineated oil blocks, including blocks throughout the Brazilian Amazon[20] that have been up for bid, and blocks that are in development and under exploration in the Solimoes and the Amazonia basins. Rosneft is a major block operator and their Solimões Gas Project, which includes new wells, the construction of a pipeline system and a thermoelectric plant in Manaus, is heralded as a key opportunity to increase oil and gas expansion in the Solimões and Amazonas basins for future bidding rounds.[21] Gas production for national use is prevalent, and while there are a handful of operational blocks in the Brazilian Amazon that produce small quantities of crude oil, there was no evidence of export from these areas in the analysis.

Oil extraction in the Western Amazon is concentrated in the Oriente Basin in the Ecuadorian Amazon, in the Putumayo region of Colombia, and in the Loreto Basin in Peru. These areas include lowland rainforest and forests that transition from lowland to the foothills of the Andes. The region has some of the highest concentrations of biodiversity on the planet.



## Pollution

Oil extraction in the Western Amazon is a significant source of soil, water, and air pollution, especially for local and Indigenous communities who rely on the rivers for food and drinking water. Blood lead levels in such communities are far above acceptable levels for human health and are associated with various illnesses, including cancer.[22]

Oil extraction has already caused irreparable harm. Decades of drill and dump practices by companies such as Chevron and Occidental Petroleum have created widespread environmental damage and a public health crisis in the region that has left communities in dire need of remediation, potable water, and health care. In some areas, cancer rates are five times the national average.[23] In addition, flaring from oil wells pollutes the air and has led to a spike in respiratory illnesses.[24] Pollution is also harming the fish and animal life that are staples in culture and local diets, leading to food insecurity and bioaccumulation of heavy metals in animals and humans alike, which also contribute to cancer rates and other illnesses.[25]

The cause of this contamination is a long history of negligence by block operators and poor oversight over the industry by government actors. Uncontrolled waste water, oil spills, chemical dumping, flaring, run-off and sedimentation are examples of the bad practices that oil companies get away with in the Amazon. Starting in the 1960s, commercial oil extraction in Ecuador operated with very little oversight.

From 1972 to 1993, more than 30 billion gallons of toxic waste and crude oil were discharged into the land and waterways of the Ecuadorian Amazon, about 140 times the amount spilled by BP in the Gulf of Mexico in 2010. There are still 1785 pools and 704 open pits of toxic waste officially registered in the region that have yet to be remediated and continue to be a source of contamination for communities who drink, bathe, and fish from rivers and creeks.

But the problems faced by local communities are not just from legacy contamination. Between 2005 and 2015, according to government data, reported oil spills in Ecuador top more than 350,000 barrels from 1,169 separate spills – the equivalent of more than 4,000 gallons a day – of which 82% occurred in the Amazon.[26] But too often spills in remote parts of the Amazon are not reported or intentionally kept off the record books – and the majority are never fully remediated.

Photo - Cacao fields in Ecuador share the same stretch of rainforest where Donald Moncayo spends many of his days giving tours of toxic oil waste.
©Amazon Watch

The country's two major pipelines that bring crude from the Amazon over the Andes to the Pacific for export continue to face major issues. The 500 mile (800 km) route crosses 94 seismic fault lines and several volcanoes. All this seismic activity contributes to the risk of ruptures. But the major threat now to the integrity of the pipelines and surrounding infrastructure is severe regressive land erosion related to the construction of the Coca-Coda Sinclair hydroelectric dam along the Coca River. Both pipelines ruptured in April 2020, spilling 15,800 barrels of crude into the river, contaminating drinking water and ruining crops for tens of thousands Indigenous peoples, who were already reeling from the affects of the COVID-19 pandemic. More than a year later, they continue to await a full remediation and redress while the erosion continues unabated.

Gas flaring is another major source of contamination affecting communities and the fragile ecosystem of Ecuador's Amazon. A by-product of the oil extraction process considered too uneconomical to collect and sell, natural gas flaring releases a cocktail of hazardous compounds and chemicals like benzene, formaldehyde, polycyclic aromatic hydrocarbons (PAHs, including naphthalene), among others, contribute to the creation of acid rain, as well as CO2 emissions. There are 447 gas flares in Ecuador's Amazon, which burn 24 hours a day, 7 days a week at 400° Celsius (750° Fahrenheit) and many have been doing so for decades. Communities have long pointed to the flares as a source of respiratory ailments. A 2017 study found higher than average cancer rates near flaring sites and other oil facilities.[27] A court ruled in 2021 in favor of a suit brought by nine Amazonian girls demanding the flares be shut down because they violate the right to live in a healthy environment.

Photo - Maria Aguinda, the lead plaintiff in the Aguinda v. Chevron lawsuit, and her daughter Lydia Aguinda, use a makeshift wooden boom to corral crude oil 35 years after it was spilled by Chevron/Texaco. ©Amazon Watch



## Indigenous rights violations

**Oil extraction in the western Amazon goes hand in hand with violations of Indigenous rights. Virtually all current extraction, expansion, and exploration plans are occurring on ancestral Indigenous territories and most on titled territories without Indigenous consultation or consent. The lack of Free, Prior, and Informed Consent (FPIC), a pillar of Indigenous peoples' right to autonomy, self determination, and participation in any governmental decisions that affect them, not only occurs around a specific planned project, it also occurs at the national level regarding legislation.**

In October 2021, Ecuador's national and regional Amazon Indigenous organizations filed suit against Executive Decrees 95 and 151, which usher in sweeping reforms of Ecuador's oil and mining policies. The reforms are aimed at expanding extraction and attracting foreign investment under President Lasso's pledge to double oil output. Both decrees violate Indigenous rights to Free, Prior, and Informed consultation and Consent in the face of any decision (normative or administrative) that is recognized in ILO Convention 169, the United Nations and American Declaration on rights of the Indigenous Peoples and in the Constitution of 2008, article 57 numerals 7 and 17; and ratified by the Constitutional Court of Ecuador.

The government is also bound by decisions and precedent set from its own judiciary and that of international courts. In multiple cases, lower courts, the Constitutional Court, as well as the Inter-American Court of Human Rights have found the government responsible for violating FPIC. The decrees also undermine other rights and protections guaranteed by the constitution like the right to live in a healthy environment and the rights of nature.

While Ecuador's constitution includes the right to Free, Prior and Informed Consultation, it does not include consent and therefore misses the international standard. Ecuador also currently has no FPIC law – making it impossible for Indigenous people to properly exercise their constitutional right. Previous administrations have attempted to get around this by issuing executive decrees on the right to FPIC, which were thrown out in the courts for not having consulted Indigenous peoples. Understanding that the lack of FPIC was delaying projects in the courts and undermining investor confidence, the extractive industries tried to advance favorable legislation, again without consulting or obtaining the consent of the very people the legislation is meant to provide these rights to.

"It is our right, our territory, our decision. We, as Indigenous nations and communities in Ecuador, are the holders of inalienable rights, recognized by our constitution. Ecuador is a plurinational state and is obligated to incorporate our interests in the interests of the nation. We reject the ongoing violation of this right and any attempt to undermine it," CONFENIAE statement.

But the rights violations are not just limited to the lack of FPIC. According to Global Witness, 227 environmental and land defenders were killed in 2020, an average of 4 per week.[28] One third of these lethal attacks were against Indigenous peoples, and with 30% linked to extractive resource projects. Colombia continues to be the most dangerous place, with 65 killings, and 6 were killed in Peru, the majority in the Amazon region. A 2020 study by the Alliance for Human Rights in Ecuador found multiple cases of rights violations against Indigenous land defenders in recent years.[29] Three have been murdered in Ecuador's Amazon, and death threats and intimidation are commonplace against Indigenous leaders who have spoken out against the oil industry, as are criminalization and persecution.

# Deforestation

**During oil exploration and production, the rainforest is fragmented by an expanding network of roads and pipelines that link oil wells to export terminals. Then the roadsides are colonized and deforested in cycles of shifting agriculture that denude forest soils and cause erosion. Slowly, the forest is subjected to a 'death by a thousand cuts' and the Indigenous inhabitants are transitioned to the poverty of landlessness as lack of food security, safe water, and the increasing risk of pollution-related illness drives them from their ancestral homes.**

## Case Study 1: Yasuní National Park

In Yasuní National Park, traditional territory of the Waorani Indigenous peoples, a UNESCO Biosphere Reserve and one of the most biodiverse places on the planet, there are eight oil blocks, and plans to drill over 600 new wells. The most productive is Block 43, or Ishpingo-Tambococha-Tiputini (ITT) as it is known by its oilfields. Production began in July 2017 and in a few short years it has become one of the most productive blocks in Ecuador. Petroecuador has produced 67.7 million barrels from the block so far, with a large proportion of the country's probable, possible, and contingent reserves located there.

Petroecuador states that the ITT has reserves of more than 1,672 million barrels, making it the largest project in the history of oil exploration in the country [30] – a much different fate for the park than the one envisioned in 2013 when the Ecuadorian government petitioned the international community to help them pay to keep the oil in the ground.[31]

Petroecuador subcontracts drilling to Chuanqing Drilling Engineering Company (CCDC), a subsidiary of the Chinese National Petroleum Company (CNPC), who is also a block operator in Ecuador and a major creditor in oil-backed loans to the Ecuadorian government. Petroecuador and the CCDC announced on March 6, 2020 that they would begin a new drilling campaign in the Tambococha region of Block 43, with 24 new wells. While several of the Tiputini wells are outside of Yasuní National Park, the Tambococha and Ishpingo fields are within the park boundaries and must be accessed via roads through intact forests. Petroecuador announced on June 3, 2020 that 26.6 ha of forest in Block 43 had been cleared for the new wells, including ~ 2.4 km of new forest road connecting the Tambococha B field to the Ishpingo A field, deeper in the park. [32,33] Petroecuador employs a restricted 'ecological access' design for their roads in the park, limited only to oil personnel.[34] But road construction continues, putting the Tagaeri and Taromenane Indigenous groups at grave risk. In September 2021, a 2.2 km road from Tambococha B to oil platforms Tambococha C, Ishpingo A and Ishpingo B was documented from satellite photos, putting it 0.5 km from the designated buffer zone and 10.5 km from the protected "no go" zone for the Tagaeri and Taromenane.[35] Petroecuador plans to drill Ishpingo C inside the buffer zone, Ishpingo D on the border of the "no go" zone, and Ishpingo E inside the "no go" zone.[36]

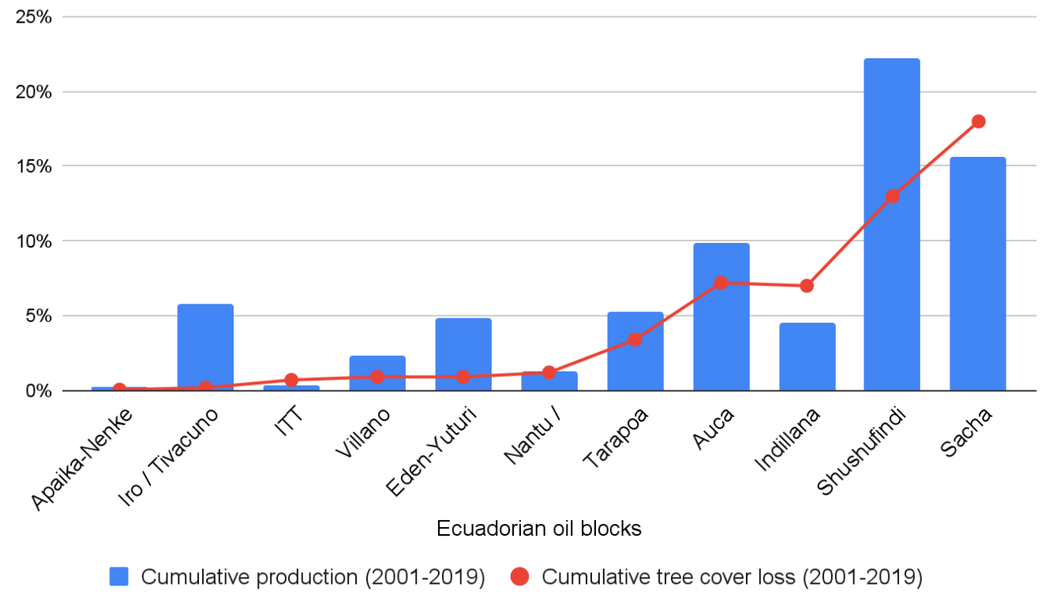
**The greatest concentration of forest loss due to these practices overlaps with the three most active oil blocks.**



Deforestation along roadsides is a well-documented driver of forest loss and there is a strong positive correlation between oil drilling and deforestation in the Ecuadorian Amazon.[37,38] Ecuador has one of the highest road densities of the Amazon basin.[39] Oil exploration and production opens roads in intact forests, leading to colonization. For example, by migrant workers and their families who clear land at the roadside, even in Indigenous ancestral territories.[40] They practice shifting agriculture, where small plots of land (0.5ha in size) are cleared in succession as the tropical forest soils are quickly exhausted.[41] The deforestation and colonization threatens Indigenous ways of life and food security, as well as their cultural and spiritual practices. Roads are conductors for economic, cultural, and environmental change. As the oil flows out, the negative impacts on Indigenous communities flow in.

Shifting agriculture is the number one cause of deforestation in Ecuador and the greatest concentration of forest loss due to these practices overlaps with the three most active oil blocks: Shushufindi, Auca, and Sacha.[42] These blocks have experienced 22%, 12%, and 35% forest loss respectively since 2001 according to Global Forest Watch, with the peak of deforestation in 2017. In comparison, Block 43 (ITT) has had forest loss of 1% since 2001. Given that Shushufindi, Auca, and Sacha have been in production for much longer, they may represent the potential fate of the ITT. Figure 1 below shows the trend (in red) in cumulative oil production for the top 3 public and top 3 private blocks in Ecuador as of 2017 (shown as a percent of the total cumulative production – 6,057,000,000 barrels).[43] It also shows the forest loss in 2019 as a percent of forest extent in 2001.[44] The rationale for taking 2017 production data and 2019 forest loss data is to take into account the delay between the installation of oil infrastructure (well pads, roads) and the impact of the roads on the forest. The correlation between the two is indicative of the threat of deforestation posed by increasing oil production.[45]

Figure 1. Cumulative Oil Production as of 2017 and Cumulative Tree Cover Loss as of 2019: The relationship between oil production and tree cover loss, with a two year time lag between production and impact on tree cover signifying the time taken for roadside colonization after new roads and infrastructure are installed. The blocks with the most development are also the blocks with the most tree cover loss.



**Road modelling completed for the Ecuadorian Amazon in 2017 predicted that forest cover in the region could drop to 48% by 2030.**

This threat may increase with proximity of the oil block to urban centers, meaning that the ITT's remoteness may help decrease the threat, at least in the short-term. However, given the strong relationship between oil expansion, road expansion, colonization, and deforestation, these areas of Yasuní National Park exploited for oil are under serious long-term threat of deforestation. Road modelling completed for the Ecuadorian Amazon in 2017 predicted that forest cover in the region could drop to 48% by 2030.[46] In addition, the prediction is essentially maintaining the trajectory of forest loss due to oil exploration and production that occurred between 1990 - 2008, but deforestation rates in 2017 were the highest ever, suggesting that the model is conservative and worse losses are possible.

Even the controlled 'ecological access' described by Petroecuador in their press release threatens Yasuní National Park. Roads built in other areas of the park to facilitate oil extraction were also under strict control, but they had a negative impact on the subsistence systems of some Waorani and Kichwa communities.[47]

## Case Study 2: Proposed Napo - Tigre Indigenous Reserve

An effort to create an Indigenous reserve around the Napo and Tigre Rivers and their tributaries was officially presented to the Peruvian government in 2005. In 2006, Law No. 28736, known as the PIACI Law or Law for the Protection of Indigenous or Native Peoples in Situation of Isolation and in Situation of Initial Contact, and its Regulations were approved by Supreme Decree. However, 15 years have passed since these laws and regulations were established and the request to create the Napo, Tigre and tributaries Indigenous Reserve was formally presented, but the Reserve has not yet been created nor is there recognition of the uncontacted Indigenous Peoples who live there.

The proposed Napo – Tigre Indigenous Reserve is affected by oil production blocks 67 and 39. Block 67, which affects the territory of the Indigenous Peoples in Isolation of the Curaray river and Arabela river basin, was awarded to the French company Perenco in cooperation with PVEP, the Vietnamese state oil company. Block 39, which also affects the Indigenous Peoples in Isolation of the Curaray river basin was initially granted to Barrett Resources Co and then to the Spanish company Repsol. While comparatively small, the volumes of oil produced from these areas are a significant threat to uncontacted peoples and the intact landscapes that make up their spiritual and physical nourishment. Additionally, the proposed Napo – Tigre Reserve could be connected via a nature corridor to Yasuní National Park, strengthening the resilience of both protected areas by maintaining a flow of genetic and biological diversity. This corridor would include the portion of Block 43 in Yasuní National Park, in order to allow for the flow of isolated communities through the intact forests of both protected areas.

Block 67 has been the most productive block of the past few years in the proposed Napo – Tigre Reserve. Perenco pumps a crude oil stream called 'Piraña' that is transported through the aging North Peruvian Pipeline to the port of Bayovar for shipment to the U.S.. Wells in the Piraña field in Block 67 are also underneath Peru's Pucacuro National Park. The oil operations pump about 2000 barrels of oil per day from 200 wells on 18 platforms.[48] The platforms are connected via road originating at the bank of the Rio Curaray and snaking through the rainforest towards Pucacuro. The current level of deforestation in the oil block is low, according to Global Forest Watch, which may be due to the remoteness of the location. Efforts to thwart all roadside colonization and illegal logging and clearing activities will be paramount to ensuring deforestation does not increase.

Chevron El Segundo purchased 100% of the U.S. imports of Piraña in the past four years. The volumes they buy are extremely low compared to the millions of barrels coming from the Ecuadorian Amazon each year. It would therefore be relatively easy for Chevron to commit to stopping sourcing from the Napo – Tigre, although there is no sign that Chevron is aware or concerned about the issue. Trade flows



# TRADE FLOWS

## Crude streams

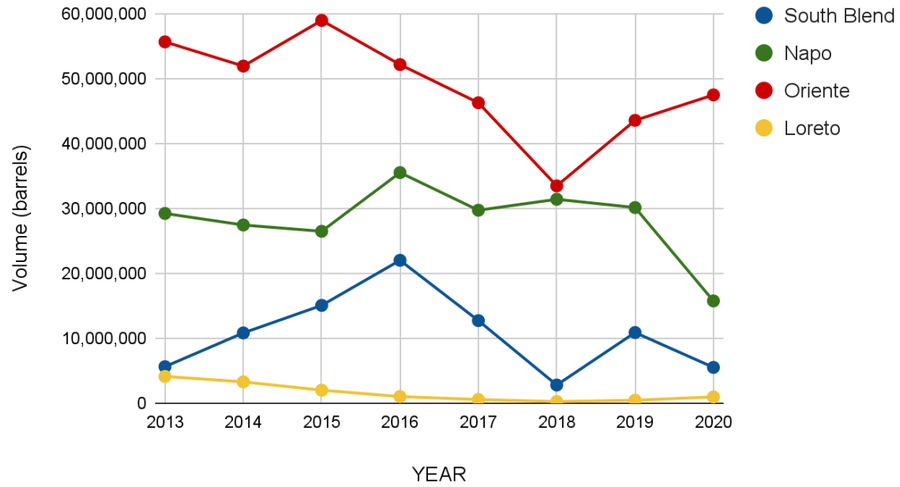
Table 1. Crude streams and connected oil blocks and regions in the Amazon Rainforest

| COUNTRY | CRUDE STREAM | API RANGE | SULFUR RANGE | OIL BLOCK # | REGION |
|---|---|---|---|---|---|
| Colombia | Chaza | +/- 27 | 0.6 - 1.09 | 84 | Putumayo |
| | South Blend | 28.4 - 28.6 | 0.6 - 1.09 | 49, 77, 84, 97, 104, 113, 118, 133, 134, 145, 146, 157, 172, 175, 176, 184, 198, 207, 209, 222, 233, 236, 237, 238, 256, 257, 261, 266, 280, 283, 286, 287, 288, 289, 290, 291, 296, 305, 326, 335, 337, 342, 345, 352, 369, 591, 763, 787 | Putumayo, Caqueta |
| Ecuador | Napo | 19.0 - 19.2 | 1.50 - 2.01 | 10, 12, 15, 17, 18, 20, 22, 28, 29, 31, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 57, 58, 59, 60, 62, 64, 65, 66, 67, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 11 (+56), 14 (& 17), 16 (& 67), 21 (+7), 55 (+61), 56 (+11), 61 (& 55), 7 (+21) | Orellana, Napo, Pastaza, Sucumbios, Morona |
| | Oriente | 23.7 - 24.1 | 1.40 - 1.51 | | |
| Peru | Bretana | 18-19.2 | +/- 0.5 | 95 | Loreto |
| | Loreto | +/- 18.0 | +/- 1.3 | 39, 64, 103, 116, 135, 192, 123/129 | Loreto |
| | Mayna | 20.0 - 24.5 | +/- 0.05 | 8 | Loreto |
| | Pirana | 20 - 20.7 | 1.53 - 2.6 | 67 | Loreto |

There are several crude streams, or types of crude oil, that come from the Amazon (see Table 1). Napo and Oriente come from the Ecuadorian Amazon while Loreto (including sub-streams Bretana, Mayna, and Pirana) come from Peru. In addition, South Blend and Chaza (a sub-stream of South Blend) are crude streams from the Colombian Amazon that are sometimes carried through Ecuadorian pipelines.

Crude streams are characterized by their API density and sulfur content. The major crude stream is Oriente from Ecuador, accounting for 55% of all Amazon oil imported to the U.S. annually on average.[49] Napo is 32%, while Colombian South Blend is 12% and all of the Peruvian crude streams account for only 2% (see Fig. 2).

Figure 2. Trend in U.S. imports by Amazon crude stream, 2013 – 2020.




## Global exports of Amazon oil

**The global trade in Amazon oil is dominated by exports from Ecuador, who account for almost 89% of the shipments on average from 2014 – 2019 (see Fig. 3).[50] While Brazil exports crude oil to the U.S. and other countries, 100% of the crude streams identified in Brazilian export data and U.S. import data came from the Pre-Salt regions (Santos and Campos Basins) off the southeast coast of Brazil.[51] While not within the Amazon basin or biome, the rapid expansion of oil extraction here and off the northeast coast of Brazil has major climate change implications that affect the Amazon Rainforest.**

Figure 3. Average proportion of global Amazon oil exports by shipment origin, 2014-2019

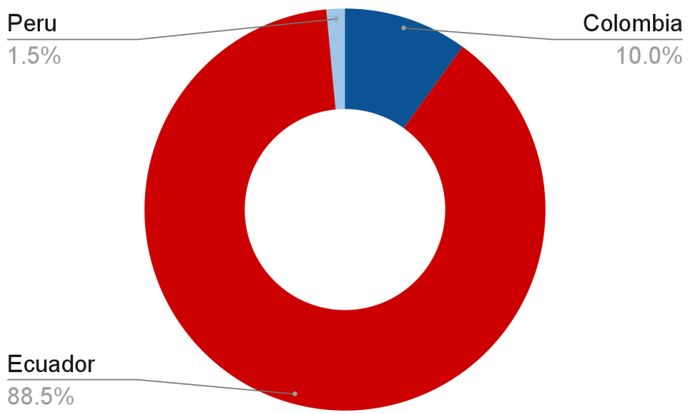
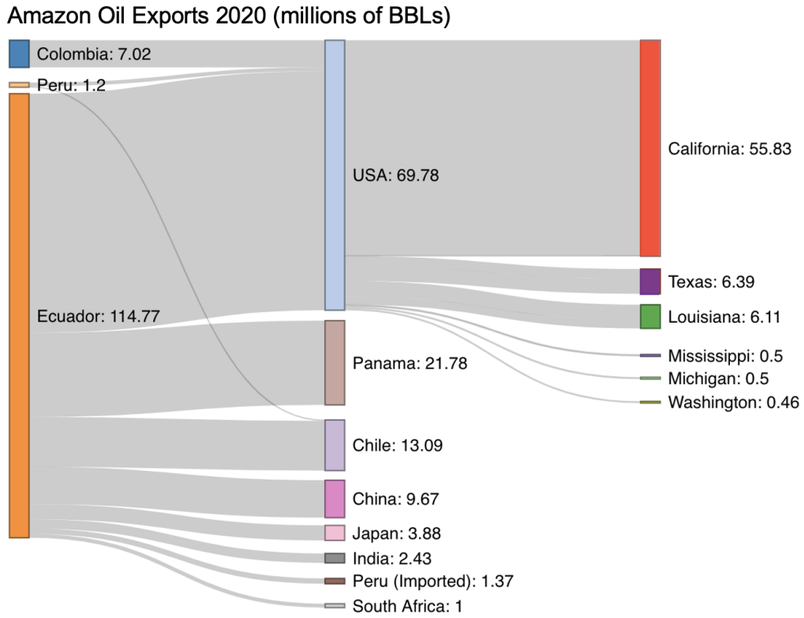



Figure 4. Trade flow of crude oil from the Amazon Rainforest, 2020 (in millions of barrels)

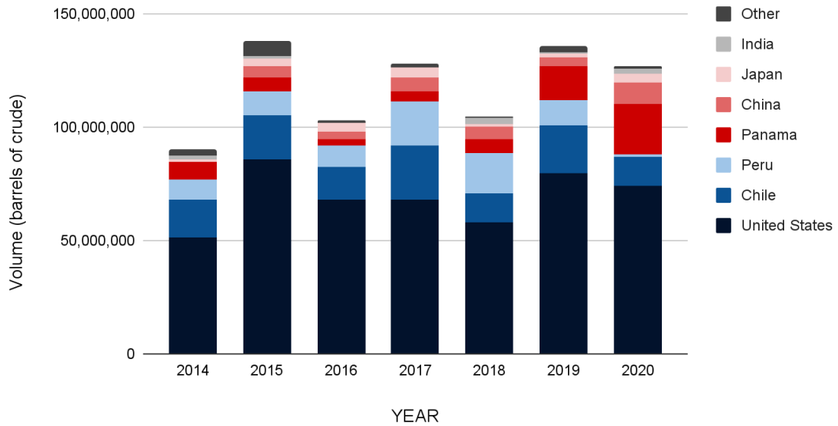



In 2020, Colombia and Peru made up about 7% of the total volume of Amazon oil exports. Ecuador is the major source of Amazon oil (93% in 2020), selling in North and South America predominantly (see Fig. 4). The major buyers of Amazon crude are in the U.S., which accounts for 66% of the global trade on average from 2014 – 2020. Over 624 million barrels of Amazon oil went to the U.S. in this period.[52]

Other countries make up about 35% of the global export, including Panama, Chile, China, Japan, India, and Peru. Chile and Peru are important regional destinations, where Amazon crude is refined to make diesel and gasoline for their domestic consumption. China and Japan have consistently imported minor volumes, and India purchases on occasion for the Jamnagar Refinery in Gujarat. Panama is also an important trading partner, but as a major transiting point for crude oil it is likely that this oil flows to other countries beyond Panama.

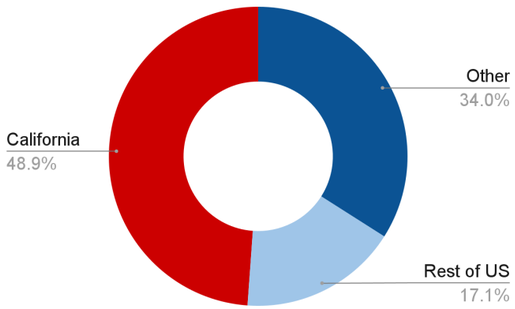
# U.S. imports of Amazon oil

Figure 5. Amazon oil exports from Ecuador, 2014 -2020. Since export data for Colombia and Peru does not indicate the destination country and Ecuador is 89% of exports, Ecuador export data is used as a proxy.




Overall, the U.S. dominance as the destination for Amazon oil is a fairly steady trend (see Fig. 5). While other countries' volumes have changed (e.g. Peru, who used to be a major regional buyer until 2020), the U.S. is consistently sourcing crude oil from the Amazon Rainforest.[53] Refineries on the West and Gulf coasts buy the heavy sour Amazon crude and refine it for diesel, gas, and jet fuel.

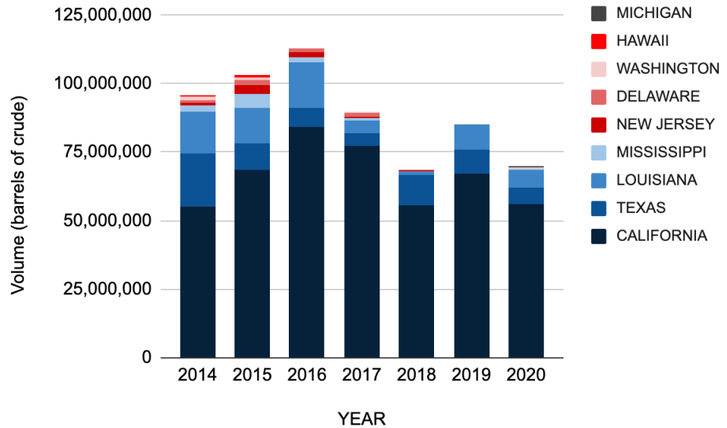
Figure 6 . Average share of the global export in Amazon crude by destination, 2014 – 2020.




Staggeringly, California buys almost 50% of the global export in Amazon crude, making it the number one global destination for crude oil extracted in the Amazon Rainforest (see Fig. 6).[54] The flow of Amazon crude is uncharacteristically concentrated, suggesting that Californian refineries have a preference for the heavy sour crude from the Amazon.

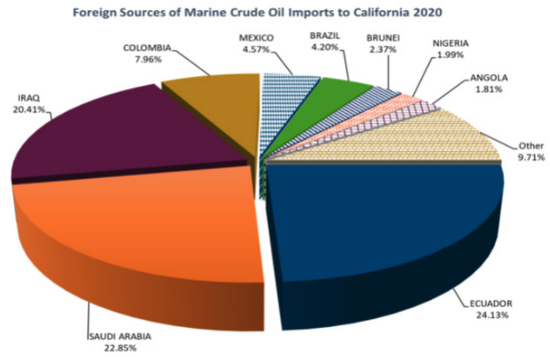


Figure 7. California's major share of U.S. imports of Amazon oil is a consistent trend.




California's import of Amazon oil is also a steady trend. Their take is 74% of U.S. imports, on average (2014 – 2020) (see Fig. 7).[55] Texas and Louisiana buy smaller volumes consistently, while Washington, Delaware, Michigan, Mississippi, Hawaii, and New Jersey intermittently buy small volumes.

Figure 8. Foreign sources of marine crude oil imports to California, 2020. From California Energy Commission. April 6, 2021.



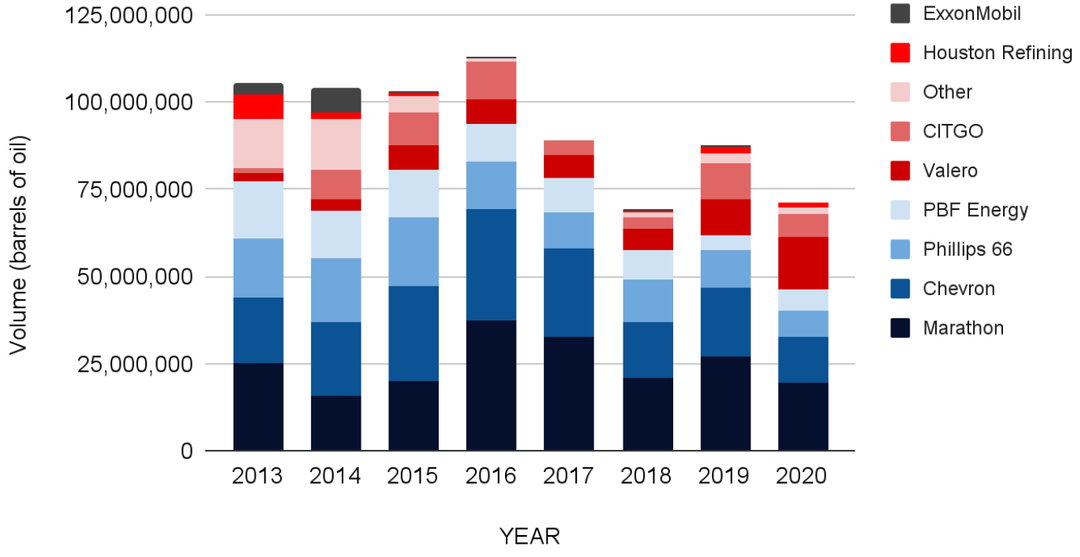

Ecuador is currently the largest source of foreign crude oil imports for the state, accounting for approximately 24% of California's total annual crude imports in 2020 (see Fig. 8).[56] Saudi Arabia has consistently been the number one source of foreign crude oil for California, but in 2020 they were replaced by Ecuador, who jumped from 18% to 24% of California's supply. Importantly, in 2020 the total volume of foreign crude imports decreased by 33% over 2019, with a 40% reduction in imports of Saudi crude but only an 11% reduction in Ecuadorian crude. This suggests that Ecuador's relative gain is actually a reflection of changes in sourcing from Saudi Arabia, and not an increase in oil from Ecuador.

# REFINING AND DISTRIBUTION IN THE U.S

## Refineries using Amazon oil

Chevron El Segundo, Marathon Martinez, and Marathon Los Angeles refineries account for 47% of all U.S. imports of Amazon oil (2013 – 2020) making Chevron and Marathon the biggest buyers of Amazon oil in the world.[57] In terms of total volume to a single refinery, Chevron El Segundo has purchased the most, but the combined volume of both Marathon refineries makes Marathon Petroleum the biggest buyer of Amazon oil up until 2020, when Marathon announced first a temporary and then a permanent closure of its Martinez refinery. In 2020, Valero increased their share of Amazon oil, outpacing Chevron to become the 2nd largest consumer of Amazon oil that year behind Marathon (see Fig. 9).

Figure 9. Volumes of Amazon crude oil purchased by U.S. refineries 2013 – 2020.






## Amazon oil utilization rates

The volumes of Amazon oil going to U.S. refineries can be calculated as an input or utilization rate; a relative rate of Amazon oil inputs to other inputs based on the capacity and utilization of the refinery. This rate reflects the proportion of Amazon crude going into production and allows for a comparison between refineries. Table 2 shows the top refineries in the U.S. by their Amazon oil utilization rate (see Annex 1 for full list).[58] All of the top refineries are in California. Their average rates from 2013 – 2019 are consistent; whereas in 2020 the closure of the Marathon Martinez refinery abruptly changed the order.

In past years Chevron El Segundo had routinely topped the list, followed by Marathon Martinez, in 2020 Chevron El Segundo's rate declined and Marathon LA's rate increased. The utilization rates at Valero's two California refineries also more than doubled, suggesting that the Amazon crude no longer purchased by Martinez was (at least partly) going to Valero (see Fig. 10). In terms of absolute share, Marathon LA and Chevron El Segundo, being larger refineries, still processed more Amazon crude than Valero.

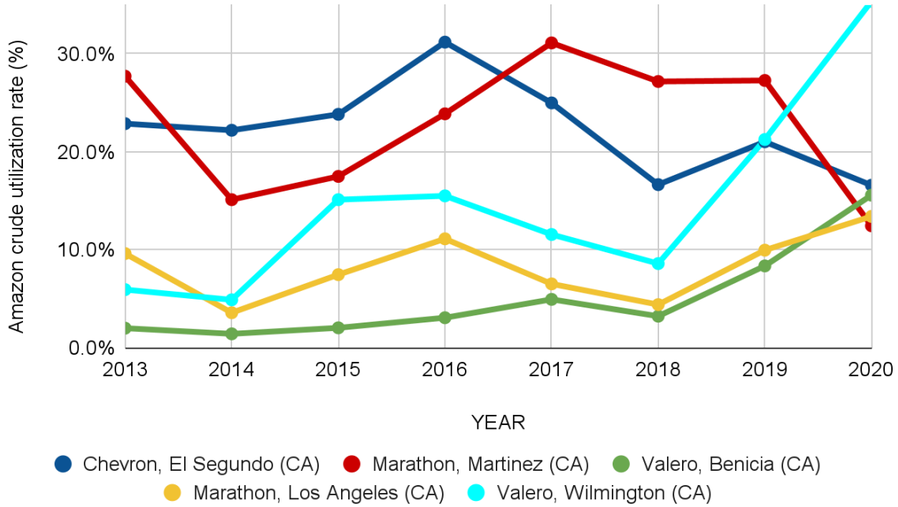
Table 2. The top refineries in the U.S. by their relative Amazon utilization rates (average and 2020) and by their absolute proportions of U.S. imports of Amazon crude oil.

| REFINERY | AMAZON UTILIZATION RATE (average 2013-2019) | AMAZON UTILIZATION RATE (2020) | % OF U.S. AMAZON CRUDE | LOCATION |
|---|---|---|---|---|
| **Valero, Wilmington** | **14.8%** | **35.3%** | **12.5%** | Los Angeles |
| **Chevron, El Segundo** | **22.4%** | **16.6%** | **17.3%** | Los Angeles |
| **Valero, Benicia** | **5.1%** | **15.6%** | **8.8%** | San Francisco |
| **Marathon, Los Angeles** | **8.2%** | **13.4%** | **18.9%** | Los Angeles |
| **Marathon, Martinez** (CLOSED MAY 2020) | **22.8%** | **12.4%** | **7.8%** | San Francisco |

Photo - Dimitry Anikin
Unsplash.com

Another trend with the closure of Marathon Martinez was the decrease in utilization of Amazon oil in the San Francisco area, and an increase in the Greater LA area. This is significant because it means that in 2020, Southern California became the world's biggest consumer of Amazon oil. While collectively the top 5 refineries buying Amazon oil account for 65% of all of the Amazon oil imported to the U.S. in 2020, the three largest, all in Los Angeles, account for 49% of U.S. imports, or 25% of the global export of Amazon oil.[59]

Figure 10. Trend over time in the relative Amazon utilization rates of top U.S. refineries.




## Impacts of the Pandemic

Since the onset of the global pandemic, gasoline consumption worldwide is estimated to have declined 11 % over 2019 while jet fuel consumption worldwide is estimated to have declined 26%.[60] This dramatic decline is directly attributable to the shut down of air travel due to the pandemic. Global aviation declined 60% by the end of Q1 2020, reducing world oil demand by 10.8 million barrels per day over 2019.

Diesel consumption in 2020 is estimated to have declined 7% over 2019 levels, or about 2 million barrels/ day. The drop is not as dramatic as for jet fuel, since the share of diesel demand for transport is high, and truck fleets were still transporting goods during the spring, albeit at a reduced level due to business closures.[61] The California Energy Commision report that fuel production for July 4 - July 31, 2020, relative to the 5 year average, was down 18% for gas, 60% for jet fuel, and 25% for diesel.[62]

The reduction in demand devastated oil exports for Ecuador. The landed cost value of Oriente averaged $10.48 USD per barrel (BBL) in April 2020, down from $65 USD per barrel in April 2019. Oriente is benchmarked on West Texas Intermediate (WTI), which dipped into negative values in April for May deliveries.

Consequently, May 2020 saw the lowest level of U.S. imports of Ecuadorian oriente and napo crude streams. Only 1,806,000 barrels were traded, the lowest level since 1999.[63] By August 2020, the price had rebounded to $39.31 USD/ BBL.

Close on the heels of the onset of the pandemic, Marathon's Martinez refinery announced a temporary closure of the facility, citing weak demand due to the pandemic. By August 2020, the closure became permanent, citing plans to use it as an oil storage facility or possibly transition it to renewable diesel production.[64] In October 2020, Marathon began seeking the permits to conduct this conversion, anticipating a 2023 opening of a renewable fuels facility creating predominantly diesel from feedstocks such as animal fat, soybean oil, and corn oil.[65] Also in August, Phillips 66 announced their intention to convert their Rodeo refinery in San Francisco to the World's largest producer of renewable fuels. They also plan to use feedstocks from used cooking oil, fats, greases, and soybean oils.[66] While the conversion of two oil refineries to renewable fuels seems promising, there is considerable risk that the focus on plant-based oils would continue to put tropical forests at risk of deforestation, as oil crops such as soybeans, corn, and palm are major drivers of tropical deforestation.



# AMAZON RATINGS

To understand how much Amazon oil is in gasoline, jet fuel, and diesel produced in the U.S. and particularly in California, the utilization rate for the crude oil inputs is multiplied by the processing gain.[67] Refined products are less dense than crude oil, resulting in an increase or gain in volume per gallon from inputs to outputs. The result of this formula is the Amazon rating for any refined product. For example, if Valero Wilmington's utilization rate is 35.3% and the processing gain is 6.7% then the Amazon rating for gas, diesel, and jet fuel from the refinery is 37.9%.

Also, per barrel of crude, fairly consistent proportions of gasoline, jet fuel, and diesel are extracted and the average ratios are used to estimate how many gallons of each major fuel type come from Amazon oil. Once the ratio is applied, the total volumes of gas, diesel, and jet fuel produced by the refinery from Amazon oil can be estimated and traced through the supply chain. See Annex 1 for Amazon Ratings and total Amazon-derived production for all U.S. Refineries in 2020.

Common carrier pipelines owned by Kinder Morgan make up the largest proportion of the refined product distribution network. Kinder Morgan batches gasoline, diesel, and jet fuel products from refineries concentrated in the Greater LA and the San Francisco Bay areas to more efficiently utilize pipeline capacity.[68] Batching refers to sending refined petroleum products via the pipeline to a bulk fuel terminal by product specification rather than brand. That means that what is delivered may not necessarily be the exact fuel that was shipped (e.g. Chevron gas), but it will meet the same specifications for the product.

This creates a 'com mingled' or generic product from the refineries' outputs of gasoline, diesel, and jet fuel feedstock.[69]At the receiving pipeline terminal, or at a nearby proprietary marketing terminal, the generic feedstock is blended (e.g. with ethanol) and specific fuel additives (e.g. detergents) are injected to create branded products such as 'Chevron gas.' In California, ethanol makes up about 10% of finished gasoline.[70] This process of genericization and re-branding is an important aspect of the distribution of Amazon-derived gas, diesel, and jet fuel, since it means that essentially all product not distributed directly from the refinery can be calculated using the average of the Amazon ratings of all of the refineries' in the distribution system, creating a consumer market where all fuels produced in the state are about 11% derived from the Amazon Rainforest, on average.[71]

Photo - Remnants of "remediation" mark a recent oil spill site near Cuninico, a Kukama Indigenous community on the Marañon River in the northern Peruvian Amazon. Within a span of 6 months in 2013, five separate spills have resulted from breaks in Petroperu's North Peruvian pipeline.
©Amazon Watch

However, the nature of pipeline distribution in California means that refineries in Southern California distribute through Southern California, Southern Nevada (Las Vegas), and Arizona (Phoenix) while refineries in the San Francisco Bay area distribute throughout Northern California and to Northern Nevada (Reno), allowing for regional calculations of Amazon fuel based on refineries serving these 'distribution basins' (see Table 3). Approximately 75% – 85% of all refined petroleum products are distributed via Kinder Morgan pipelines, through discrete networks in Northern and Southern California (see Figure 11).[72] The remaining 15% – 25% percent is transported by maritime, truck or rail e.g. from loading racks at the refineries or by local proprietary pipelines in major cities. Along the routes, bulk fuel terminals act as distribution points for products going to retail gas stations and commercial trucking fleets while dedicated pipelines run jet fuel to airports and military bases.

Table 3 shows the average Amazon utilization rate (refinery input) and Amazon ratings (refinery outputs) for 2020 across the basins.[73] It also calculates the ratio of Amazon-derived fuels versus fuels from other crude sources. Across California, one in every nine tanks of jet fuel, gasoline, or diesel pumped in the state comes from the Amazon Rainforest. In Northern California, the ratio jumps up to one in every thirteen, reflecting the lower utilization of Amazon oil in Bay Area refineries due to the Martinez closure. In Southern California, a staggering one in every seven tanks of fuel pumped comes from the Amazon Rainforest.

Figure 11. Refining centres in California and their distribution networks. Figure from U.S. EIA website.

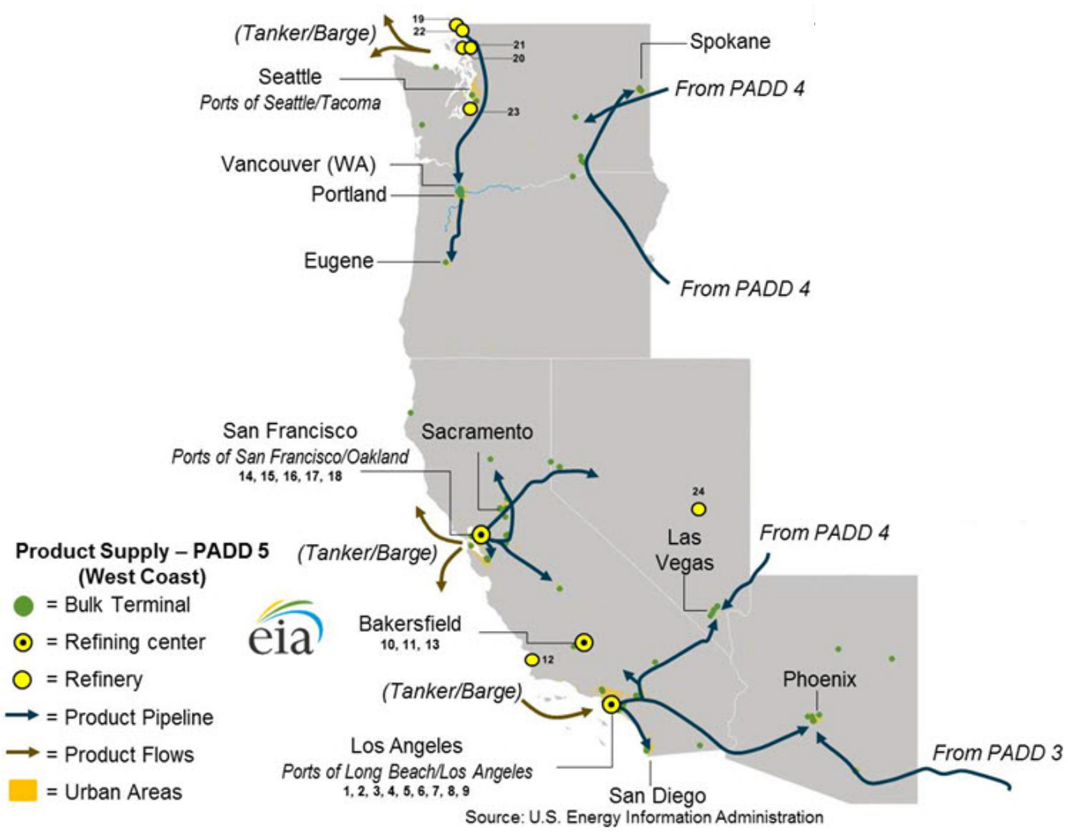





Table 3. The average proportion of crude inputs and refined outputs that come from the Amazon Rainforest, by 'distribution basin' in California. For central California, where there is no pipeline distribution from the Greater LA or Bay areas, the Amazon rate is assumed to be 0%.

| CA REGIONS | AMAZON CRUDE INPUT RATE | AMAZON-DERIVED REFINED PRODUCT OUTPUT RATE | ONE IN... |
|---|---|---|---|
| California | 10.8% | 11.6% | 9 |
| - Northern California | 7.5% | 8.1% | 12 |
| - Central California | 0.0% | - | - |
| - Southern California | 13.9% | 14.9% | 7 |

All bulk terminals in California were mapped and assigned Amazon ratings based on the location of the terminal and how it receives finished petroleum products. Bulk fuel terminals at refineries, and the terminals connected to refineries via their own pipeline systems received the Amazon rating calculated at the refinery, rather than an average rating for the basin. This is especially important in the Greater LA area, where several refineries have their own pipelines, allowing consumers in those areas the chance to choose between higher and lower Amazon rated gas, diesel, and jet fuel.

That means that LAX, for example, could choose between jet fuel from Chevron El Segundo, with a 2020 Amazon rating of 17.8% and jet fuel from PBF Energy Torrance, with an Amazon rating of 3.7%. Both refineries are close to the airport and supply LAX with jet fuel (see Fig. 12). Likewise, this rating system offers the 88 municipalities in Los Angeles County the opportunity to shape public procurement strategies that exclude Amazon oil by preferring lower-rated refineries, as well as alternative fuels and electric vehicles.

Figure 12. Proprietary pipelines in the Greater LA area serving the Los Angeles International Airport (LAX) and the refineries that own them or are on route.

## Airports and airlines

**California is the largest consumer of jet fuel in the U.S**. and accounted for 17% of the nation's jet fuel consumption in 2019 (the latest statistics on record).[74] That is almost double the consumption in Texas, the second state on the list. Airports in California are serviced by, among others, Chevron Aviation, Vitol Aviation, Shell Aviation, and Air BP.[75] Chevron El Segundo provides approximately 40% of the jet fuel consumed in Southern California.[76] In 2020, U.S. airlines consumed more than 10.2 billion gallons of jet fuel. See Annex 2 for detailed methodology for calculating airline fuel consumption estimates.

**LOS ANGELES INTERNATIONAL AIRPORT (LAX)**
LAX has pipeline delivery from all of the Greater LA refineries. The bulk fuel terminal at LAX, LAXfuels, has an Amazon rating of 16.9% – **meaning 1 in 6 gallons pumped is derived from the Amazon rainforest.** The sheer size of the airport, with an annual estimated jet fuel consumption of approximately 1 billion gallons per year, **means that LAX is the number airport globally for the consumption of jet fuel from the Amazon rainforest.**[77] LAX's rating reflects the proportion delivered via proprietary pipeline from Chevron El Segundo (40%) at El Segundo's Amazon rating, and the proportion coming from other refineries (60%), as an average of those refineries ratings.

A typical flight between LAX and JFK in New York will burn 12230 gallons of jet fuel, 2000 of which would come from the Amazon.[78] That is an entire fueling trucks' worth of Amazon jet fuel every time a plane takes off on LAX's most common route. Airlines with hubs at LAX include American, Delta, United, Southwest, and Alaska Airlines. These are the top airlines at LAX by market share (based on revenue passengers per year weighted for international vs. domestic travel). American, Delta and United consume about 30 million gallons each of Amazon-derived jet fuel every year across the U.S., based on their annual fuel consumption (see Table 4).[79] On average, about half of this consumption could be attributed to the airlines' hubs at LAX, based on their market share at LAX and LAX's estimated total fuel consumption of 1 billion gallons in 2020. This makes these airlines the biggest global consumers of jet fuel from the Amazon Rainforest.

Table 4. Estimated consumption of jet fuel from the Amazon Rainforest for the top 5 airlines by market share at LAX.

| RANK | AIRLINE | MARKET SHARE AT LAX | EST. JET FUEL CONSUMPTION (GAL) AT LAX | EST. AMAZON JET FUEL CONSUMPTION (GAL) AT LAX | U.S. TOTAL JET FUEL CONSUMPTION (GAL) | EST. U.S. TOTAL AMAZON JET FUEL CONSUMPTION (GAL) | % AT LAX |
|---|---|---|---|---|---|---|---|
| 1 | **American Airlines** | 18 % | 177,301,900 | 14,303,088 | 1,643,144,000 | 31,208,945 | 46% |
| 2 | **Delta Air Lines** | 17 % | 168,239,738 | 13,572,036 | 1,579,508,000 | 30,000,279 | 45% |
| 3 | **United Air Lines Inc** | 12 % | 122,545,400 | 9,885,837 | 1,582,187,000 | 30,051,163 | 33% |
| 4 | **Southwest Airlines** | 9 % | 91,593,781 | 7,388,945 | 1,273,126,000 | 24,181,033 | 31% |
| 5 | **Alaska Airlines** | 6 % | 62,709,637 | 5,058,837 | 356,135,000 | 6,764,226 | 75% |

Other Southern California airports also have a 16.9% Amazon rating, where one in every six tanks of jet fuel pumped is from the Amazon Rainforest. These airports include:

- Hollywood/ Burbank Airport (BUR)
- Ontario International Airport (ONT)
- Long Beach Airport (LGB)
- San Diego International Airport (SAN)
- John Wayne Airport (SNA)
- San Bernardino Airport International Airport (SBD)
- Palm Springs International Airport (PSP)



**LAX is the number one airport globally for the consumption of jet fuel from the Amazon rainforest.**

**SAN FRANCISCO INTERNATIONAL AIRPORT (SFO)**
SFO is the second busiest airport in California, after LAX. The pipeline connection to SFO is a batched common carrier (Kinder Morgan) so the Amazon rating for the airport is an average of the local refineries: 8.1% in 2020.[80] That means that one in every 12 tanks of jet fuel filled at the airport is from the Amazon Rainforest. United Airlines and American Airlines both hub at SFO, with 37% and 7% of the market share by revenue passengers respectively (see Table 5).

Several Northern California airports share this rating, due to their distribution via Kinder Morgan's Northern Pipeline, where one in every twelve tanks of jet fuel pumped is from the Amazon Rainforest. These airports include:

- San Jose International Airport (SJC)
- Oakland International Airport (OAK)
- Sacramento International Airport (SMF)
- Fresno Yosemite International Airport (FAT)

The analysis of Amazon jet fuel consumption at LAX and SFO suggest that a large proportion of the Amazon oil that these airlines are consuming is connected to their hubs in California, suggesting that these airlines have a responsibility to respond to the urgent need to reduce reliance on petroleum products that come from the Amazon.

Table 5. Estimated consumption of jet fuel from the Amazon Rainforest for the top 5 airlines by market share at SFO.

| RANK | AIRLINE | MARKET SHARE AT SFO | EST. JET FUEL CONSUMPTION (GAL) AT SFO | EST. AMAZON JET FUEL CONSUMPTION (GAL) AT SFO | U.S. TOTAL JET FUEL CONSUMPTION (GAL) | EST. U.S. TOTAL AMAZON JET FUEL CONSUMPTION (GAL) | % AT SFO |
|---|---|---|---|---|---|---|---|
| 1 | **United Air Lines Inc** | 37% | 206,696,453 | 16,674,371 | 1,582,187,000 | 30,051,163 | 55% |
| 2 | **SkyWest Airlines** | 11% | 63,988,540 | 5,162,008 | 75,257,000 | 6,071,043 | 85% |
| 3 | **American Airlines** | 7% | 38,652,153 | 3,118,101 | 1,643,144,000 | 31,208,945 | 10% |
| 4 | **Alaska Airlines** | 6% | 35,192,559 | 2,839,012 | 356,135,000 | 6,764,226 | 42% |
| 5 | **Delta Air Lines** | 6% | 34,399,553 | 2,775,040 | 1,579,508,000 | 30,000,279 | 9% |

**AMAZON AIR**

Amazon Air is a growing part of the Amazon.com distribution network. The airline leases and contracts delivery to other airlines such as Southern Air, Sun Country Air, Atlas Air, and Air Transport International, as well as owning and operating their aircraft outright. They have a fleet of 80-90 aircraft, including 22 Boeing 737-800 and 62 Boeing 767-300.[81] There are seven airports in California that Amazon Air or an affiliate operates from, including San Bernardino, which opened in 2021 as the regional hub.

From each airport, the average daily flights per aircraft type were identified and the fuel consumption for each type of aircraft for a medium-haul flight calculated, to estimate the total jet fuel consumption for Amazon Air at each airport.[82] Based on the Amazon rating already determined for each airport, the proportion of Amazon Air's jet fuel that comes from the Amazon Rainforest is approximately 13 million gallons per year (see Table 6).

Table 6. Airport hubs for Amazon Air in California and their estimated fuel consumption

| AMAZON AIR AIRPORTS | AMAZON RAINFOREST RATING | AVERAGE DAILY FLIGHTS[83] | DOMESTIC FLIGHTS | BOEING 767 | BOEING 737 | EST. FUEL CONSUMPTION | EST. AMAZON RAINFOREST PROPORTION |
|---|---|---|---|---|---|---|---|
| March Airfield Base | 16.9% | 9 | 9 | - | 9 | 10,938,951 | 1,853,019 |
| Ontario International Airport | 16.9% | 2 | 2 | 2 | - | 4,746,453 | 804,032 |
| Sacramento International Airport | 8.1% | 8 | 8 | 8 | - | 18,985,811 | 1,531,601 |
| San Bernardino International Airport | 16.9% | 12 | 12 | 12 | - | 28,478,716 | 4,824,191 |
| Stockton Metropolitan Airport | 8.1% | 6 | 6 | 6 | - | 14,239,358 | 1,148,701 |
| Los Angeles International Airport | 16.9% | 4 | 4 | 4 | - | 9,492,905 | 1,608,064 |
| San Francisco International Airport | 8.1% | 6 | 6 | 6 | - | 14,239,358 | 1,148,701 |
| Total | | 47 | 47 | 38 | 9 | 101,121,553 | 12,918,307 |



# Medium-and long-haul Fleets

Medium- and long- haul fleets make up about 5% of the road fleet in the U.S., yet contribute more than 20% of the emissions from the freight industry.[84] They predominantly burn diesel. Given that fleets operate across the country, the Amazon rating for refined product outputs from refineries using Amazon crude across the country was used to calculate the estimated proportion of diesel consumption that comes from the Amazon Rainforest for each fleet.[85] Diesel consumption was estimated on each fleet's total number of tractors multiplied by the average annual diesel consumption per tractor.[86] See Annex 2 for detailed methodology on calculating fleet fuel consumption estimates.

In California, trucking fleets typically buy CARB ultra-low sulfur diesel from common carriers, who fuel up at bulk fuel terminals and refineries. As explained before, most diesel is 'generic' – the product is CARB standard but indistinguishable by brand until the additives and detergents are blended into it. Once the product is delivered as a blended diesel or gas product, it is branded for marketing (e.g. Chevron diesel), but it still carries an Amazon rating associated with distribution in northern, central, or southern California. That means that no fleet operating in California is free of Amazon oil and the larger the fleet, the more Amazon oil they are consuming.

**PRIVATE FLEETS**

The top 100 private medium- and long-haul fleets used over 31 million gallons of Amazon-derived diesel in 2020.[87] **Almost 60% of these companies are in the food and drink business**, followed by 19% in oil and gas, 9% in construction, and 6% in chemicals (see Table 7).

The impact that private food and beverage trucking fleets have on the protection of the Amazon cannot be overstated. Several companies are piloting electric vehicles in their fleets, and the conversion from diesel to EV is a necessity for these companies to do their part in combating climate change. The issue is that bringing the new technology online, especially for heavy-duty trucking, is a long process. Currently, it is not happening fast enough or at a scale large enough to support the protection of the Amazon and keep global warming below 1.5 °C. However, EV technology for trucking is becoming more readily available at a commercial scale, bringing hope that private fleets can convert their diesel consumption into greener technology and reduce their reliance on oil from the Amazon Rainforest in the process – as long as the companies are willing to step up and make bold commitments to absolute reductions in carbon emissions and investment in electrifying their fleets.

Table 7. Types of private fleets and their consumption of diesel from the Amazon rainforest.

| TYPE | EST. DIESEL CONSUMPTION (GAL) FROM AMAZON OIL | % AMAZON OIL |
|---|---|---|
| **Food and beverage Company** | 31,537,000 | 58.7% |
| **Oil and Gas** | 10,045,000 | 18.7% |
| **Construction** | 4,866,000 | 9.1% |
| **Chemicals** | 3,013,000 | 5.6% |
| **Rental Trucks** | 1,717,000 | 3.2% |
| **Parcel delivery** | 428,000 | 0.8% |
| **Automotive** | 381,000 | 0.7% |
| **Furniture** | 378,000 | 0.7% |
| **Medical supplies** | 308,000 | 0.6% |
| **Paper and Packaging** | 257,000 | 0.5% |
| **Medical Waste** | 244,132 | 0.5% |
| **Other** | 545,000 | 0.4% |
| **Total** | **53,719,000** | |

Photo - The canopy of the Ecuadorian Amazon. ©Amazon Watch

**PepsiCo, the largest private fleet in the U.S.,consumed an estimated 4.4 million gallons of diesel from the Amazon Rainforest in 2020.**

**PepsiCo, the largest private fleet in the U.S.,** consumed an estimated 4.4 million gallons of diesel from the Amazon Rainforest in 2020. Most of this was for their California operations, which includes its distribution center in Modesto, where **FritoLay** is converting its fleet to zero-emissions or near-zero-emissions vehicles as a pilot test for scaling up electric vehicles.[88] 15 tractors at the FritoLay plant are slated to be converted to EVs. PepsiCo's goal is to be carbon neutral by 2040 and achieve a 75% reduction in absolute greenhouse gas emissions by 2030.[89]



**The Sysco Corp.** private fleet is the second largest in the U.S. and consumed an estimated 3.5 million gallons of diesel from the Amazon Rainforests in 2020. Their California operations are an area of high growth for the company and include nine distribution centers in Southern California and seven in Northern California. Globally, 62% of their sales are to restaurants, including major fast food chains such as **Burger King** and **Wendy's.**[90] In their 2020 CSR Report, they briefly mention purchasing renewable Liquified Natural Gas (LNG) tractors for their fleets in California, but this was more than a decade ago.[91] Sysco is piloting Daimler electric tractors in San Francisco as an effort to supplement their fleet with EVs, but their operations in Southern California use the most diesel from the Amazon rainforest, suggesting that they need to look at their operations there in order for their EV conversions to have an impact on their reliance on Amazon oil.[92]

**US Foods** consumed an estimated 2.3 million gallons of diesel from the Amazon Rainforests in 2020. The company has six distribution centers in California – two in the north and four in the south. Restaurants makeup 54% of their customer mix, including major fast food outlets. They participated in a pilot for electric trucks as a customer for Penske Truck Leasing.[93] However, it is unclear from their CSR report if the intention is to scale up EVs in their private fleet, which is the fifth largest in the U.S.[94]

**Reyes Holdings'** fleet consumed an estimated 2 million gallons of diesel from the Amazon Rainforests in 2020. The company runs **Coca-Cola** bottling in California, delivering brands such as **Coca-Cola, Sprite, Smart Water, Honest T, and Minute Maid.** Reyes Holdings has a major footprint in California and is the sixth largest private fleet in the country, but they are far behind other private fleets in terms of decarbonization. The company has a fleet of 5,019 tractors, of which 8% are hybrids and only 0.6% are electric.[95] Reyes is also the main delivery fleet for **McDonalds** via their subsidiary, Martin-Brower. Martin-Brower has a goal of achieving a 40% carbon reduction target per ton delivered, by 2030. This intensity target includes having 90% of their fleet 'alternative fuel capable', including biodiesel, natural gas, and electricity. But in the U.S. this capacity is limited to biodiesel blended diesel and does not include EVs.[96] The Reyes Beer Division, including brands such as **Heineken, Corona, and Coors Light**, recently expanded their facilities to 24 in California, one of their biggest markets. However, their fleet of over 1,500 trucks does not include any electric vehicles.[97]

**United Natural Foods Inc.** (UNFI), the main supplier for **Whole Foods,** consumed 568 thousand gallons of diesel from the Amazon Rainforest in 2020. California has the highest concentration of Whole Foods locations, with 92 locations accounting for 18% of the Whole Foods network in the U.S., suggesting that UNFI's activity in the state is considerable. While the company has set climate targets and reports on their Scope 1 emissions, they are behind their competitors when it comes to piloting pathways to electrifying their fleet of trucks, with a focus in 2021 on refrigeration trailers only.[98]

Photo - An Indigenous man navigates his boat through the Ecuadorian Amazon. ©Amazon Watch/ Caroline Bennett

**LEASER FLEETS**
Leaser fleets include parcel delivery services such as UPS, as well as general freight, refrigerated freight, heavy hauling, tank trucks, etc. By far, general freight is the segment consuming the most diesel from the Amazon, with over 156 million gallons consumed in 2020 (see Table 8). Parcel delivery, by comparison, consumed an estimated 27 million gallons although it is the second largest segment after general freight.

Table 8. U.S. consumption of diesel from the Amazon in 2020 by leaser fleet market segment. UPS and Fedex are highlighted as the top leaser fleets by fleet size.

| TYPE | COMPANY | EST. AMAZON DIESEL CONSUMED (GALLONS) |
|---|---|---|
| **Package** | **UPS** | 13,177,847 |
| | **FedEx Corp.** | 12,185,436 |
| | **Other** | 733,539 |
| **Package Total** | | 26,096,821 |
| **General Freight** | **Knight-Swift Transport** | 8,535,758 |
| | **Penske** | 7,888,380 |
| | **Other** | 135,689,764 |
| **General Freight Total** | | 152,113,901 |
| **Refrigerated Solids Total** | | 9,552,451 |
| **Heavy Hauling Total** | | 9,396,187 |
| **Tank Truck Total** | | 9,220,342 |
| **Bulk Commodities Total** | | 5,531,892 |
| **Household Goods Total** | | 4,740,782 |
| **Motor Vehicle Total** | | 3,623,438 |
| **Building Materials Total** | | 2,882,458 |
| **Other** | | 4,195,622 |
| **Grand Total** | | **227,353,894** |



**UPS** is the largest leaser fleet in the U.S. Their fleet of over 33,000 long-haul tractors consumed an estimated 13.5 million gallons of diesel from the Amazon Rainforest in 2020. The package delivery giant includes around 9,300 alternative fuel vehicles and 6,000 natural gas powered trucks ordered in 2019.[99] They have also made a commitment to purchase up to 10,000 EVs but the company has over 130,000 vehicles on the road in the U.S.[100] UPS still has a long way to go to decarbonize their fleet, despite the fact that greenhouse gas emissions (GHG) and energy use is the most important issue for the business and its stakeholders.[101]

**FedEx Corp.** is the second largest long-haul fleet, with an estimated consumption of 12.5 million gallons of diesel from the Amazon in 2020 for over 31,000 tractors. While FedEx has also worked to deploy electric vans and light trucks for last mile transport as part of their roadmap to carbon neutrality by 2040, the plan does not include specific targets for their long-haul fleet.[102] While their 2021 ESG Report mentions replacing some trucking routes with rail and support for R&D for zero-emissions technology for Class 8 trucks, it seems FedEx long-haul trucking will continue to burn diesel for the foreseeable future.

There are also **289 general freight companies** listed in the top leaser fleets, consuming an estimated 152 million gallons of diesel from the Amazon for long-haul trucking in 2020. While very few are recognizable brands, the movement to decarbonize these truck fleets is vital to reducing demand for Amazon oil. **Penske,** which is the fourth largest leaser fleet in the U.S. and consumed an estimated 7.8 million gallons of diesel from the Amazon in 2020, has been piloting electric heavy-duty trucks in California on short-haul and day routes.[103] While industry public relations is putting emphasis on decarbonization, it is unclear if there are plans and commitments to scale up pilots such as these in a timeframe meaningful to have a positive impact.

**The movement to decarbonize these truck fleets is vital to reducing demand for Amazon oil.**

Photo - An oil barge that says "Danger, Combustible, No smoking" outside a PetroPeru operation site in the Peruvian Amazon. ©Amazon Watch


Photo - Vidal Masadhi, 56, has suffered numerous health problems living in close proximity to the Sur-Oeste Station in the Ecuadorian Amazon. ©Amazon Watch

**AMAZON.COM**
2020 was a booming year for Amazon.com. The profits from populations stuck at home and shopping online helped the company increase their sales by 38% during the first year of the COVID-19 pandemic.[104] At the same time, the company committed to spending over 30 billion USD to expand their parcel delivery and shipping fleets, adding more planes, trucks, and shipping capacity to enhance their fulfillment by Amazon (FBA) offerings.[105] The company was projected to handle shipping for over two-thirds of its package deliveries in the U.S. by the end of 2020, compared to 2015 when UPS, FedEx, and the USPS handled more than 97% of Amazon.com packages.[106]

While Amazon.com's plan is to reach net zero by 2040, they will have to contend with the impact that this swift growth will have on their ability to achieve their climate goals. In the near-term, this growth means more fossil fuel consumption, and more Amazon oil consumption given their growth in Southern California especially. Most of the added shipping capacity brings more goods from China to the twin ports of Los Angeles and Long beach, meaning that Amazon.com's diesel consumption in Southern California is increasing as they truck their shipments from port to warehouses, fulfillment centers, and airport hubs such as the new 700,000 foot warehouse and Amazon Air hub at San Bernardino Airport.[107] An estimated 57% of Amazon.com fulfillment centers in California are in Southern California.

Amazon Air has also expanded during this growth spree. The airline flies out of seven airports, four in Southern California and three in Northern California. An average of 47 domestic flights operate daily using Boeing 767 (~38 daily flights) and 737 planes (~9 daily flights). By calculating the estimated fuel consumption for an average medium-haul flight per plane type, Amazon Air uses approximately 13 million gallons of jet fuel from the Amazon Rainforest annually.

**It remains to be seen if Amazon.com's will outstrip these efforts and lead to increasing use of oil from the Amazon Rainforest.**

Amazon.com also owns over 10,000 truck trailers, but only about 1,100 medium and long-haul trucks. The private Amazon.com trucking fleet uses an estimated 428,000 gallons of diesel from the Amazon Rainforest annually.[108] While they have a small private fleet focused on maximum 400 mile journeys, their leaser fleet is expanding rapidly through the Delivery Service Partner program, which has more than 1,200 linehaul service providers employing over 13,000 drivers.[109] Fuel consumption estimates for service providers are not available, but the number of companies and drivers suggests a large fleet of operators working closely and possibly exclusively for Amazon.com.

Amazon.com has ordered 700 compressed natural gas (CNG) class 6 and class 8 trucks (emitting approx. 27% less CO2 than diesel) to run goods from warehouses to distribution centres.[110] The company has also invested in 100,000 electric vans from Rivian for last mile delivery to consumers, and the first ones rolled out in LA in Feb 2021. These are early signs of the decarbonization necessary for Amazon.com to meet their climate targets, but it remains to be seen if their growth will outstrip these efforts and lead to increasing use of oil from the Amazon Rainforest and increasing carbon emissions.

Photo - Thick crude oozes from Shushufindi 61, abandoned by Chevron/Texaco and never remediated.
©Amazon Watch



## Supermarket chains

Supermarket chains consume oil from the Amazon Rainforest in a number of ways. They own their own private fleets, they are customers of leaser fleets, and they sell retail gas and diesel. They also sell a variety of products that are linked to Amazon deforestation including soy and palm oil products, beef, leather, cocoa, and a range of other deforestation-linked commodities.

**Walmart** is the largest supermarket brand, with the third largest private fleet in the U.S. The fleet consumed an estimated 3 million gallons of diesel from the Amazon Rainforests in 2020. The Walmart brand covers 310 locations across California including 30 **Sam's Club** stores with fueling stations carrying gas and diesel.[111] Walmart sold an estimated 4 million gallons of finished gasoline and 487,000 gallons of diesel from the Amazon Rainforest at these locations. Walmart also opened its first Walmart-branded fueling station in California in July 2021 in Kerman, with two more stations in Fresno under construction and dozens more planned.[112]

The fleet owned by **Kroger Co,** the largest supermarket chain in California, consumed an estimated 369 thousand gallons of diesel from the Amazon Rainforest in 2020. Kroger has nine manufacturing and distribution facilities, as well as 302 food stores (Ralphs, Foodsco, Food4Less, Ralphs Fresh Fare), including 29 new locations in 2020.[113] Kroger sold an estimated 9.5 million gallons of finished gasoline and 1.1 million gallons of diesel fuel from the Amazon Rainforest at these locations. 7.2% of their revenue in 2020 was from fuel sales.[114]

Photo - Maria Aguinda, the lead plaintiff in the Aguinda v. Chevron lawsuit, shows some of the crude oil that is still contaminating the Ecuadorian Amazon, 35 years after it was spilled.
©Amazon Watch

**Albertsons,** owner of 128 Albertsons and 240 Safeway stores across California, is the second largest grocery store chain after Kroger.[115] The company's fleet consumed an estimated 399 thousand gallons of diesel from the Amazon Rainforest in 2020, largely in distribution across California. That is on top of the retail gas and diesel sold at 48 of their Safeway locations, all in Northern California. An estimated 4.3 million gallons of gasoline and diesel from the Amazon Rainforest was pumped at these locations in 2019 based on average retail gas and diesel sales in California.[116]

**Costco's fueling stations sold an estimated 17 million gallons of gas and 2 million gallons of diesel from the Amazon.**

There are 128 **Costco** locations in California, comprising 29% of Costco's net sales in the U.S. in 2020.[117] 116 of these locations have gas stations. Costco is highly dependent on their California operations, which are 9% of the total net sales for the company in 2020. Costco's private fleet consumed an estimated 189 thousand gallons of diesel from the Amazon in 2020. While Costco's fueling stations sold an estimated 17 million gallons of gas and 2 million gallons of diesel from the Amazon. These figures are for 2019, the last available data set on California retail gas sales.

Supermarket chains without their own fleets and smaller supermarket chains such as Trader Joe's are not included in this study. Other non-grocery yet sizable fleet owners such as Walgreens were calculated and their consumption is reported in Annex 3.

## Major gasoline brands

Retail gas and diesel sales by major brands is by far the biggest source of demand for Amazon oil. There are over 10,000 gas stations in California, with total retail gas **sales topping 15 billion USD in 2019 and sales of gas and diesel from the Amazon estimated at more than 1.9 billion gallons** (see Table 9).[118]

Based on the gasoline market share by fuel brand, Marathon is the largest major gasoline brand in the state, followed by Chevron then Shell, Phillips 66, Valero, and Exxon (see Table 9). While most branded gasoline is sold by major refiners, Shell maintains a presence as an key importer of Amazon oil and as a gas retailer, despite no longer owning refineries in California. In 2020, Shell signed a deal with Ecuador to buy 20.2 million barrels of Oriente crude oil over the next 4 years. It is likely that the oil that Shell is buying from Ecuador is coming from new expansion by Petroecuador in Yasuní National Park, where increased production is creating oil stocks that Petroecuador can sell on the spot market.

However, unbranded gasoline sales are higher than any of the major brands, while the combined sales from supermarket fueling stations like Costco, Safeway, and Sam's Club are larger than Chevron. This suggests that a real decline in the reliance on oil from the Amazon Rainforest requires a decline in the demand for gasoline more generally, e.g. through the adoption of electric vehicles (EVs).

Table 9. Gasoline retailers and their market share and sales of gas from the Amazon rainforest

| COMPANY | MARKET SHARE BY FUEL BRAND | 2019 TOTAL CA RETAIL GAS SALES (GALLONS) | AMAZON GAS SALES (GALLONS) | 2019 TOTAL CA RETAIL DIESEL SALES (GALLONS) | AMAZON DIESEL SALES (GALLONS) |
|---|---|---|---|---|---|
| **Unbranded Gas** | 24.70% | 3,795,155,000 | 430,252,341 | 433,732,000 | 49,171,696 |
| **ARCO (Marathon)** | 17.50% | 2,688,875,000 | 304,834,655 | 307,300,000 | 34,838,246 |
| **CHEVRON** | 16.40% | 2,519,860,000 | 285,673,619 | 287,984,000 | 32,648,414 |
| **SHELL** | 10.80% | 1,659,420,000 | 188,126,530 | 189,648,000 | 21,500,175 |
| **76 (PHILLIPS 66)** | 8.20% | 1,259,930,000 | 142,836,810 | 143,992,000 | 16,324,207 |
| **VALERO** | 3% | 460,950,000 | 52,257,369 | 52,680,000 | 5,972,271 |
| **EXXON MOBIL** | 2.80% | 430,220,000 | 48,773,545 | 49,168,000 | 5,574,119 |
| **HYPERMARKETS** | 16.60% | 2,266,097,987 | 256,904,913 | 250,661,659 | 28,417,223 |
| **Costco Wholesale Corp.** | included above | 142,962,410 | 17,310,757 | 20,813,892 | 2,383,695 |
| **Albertsons (including Safeway)** | Included above | 45,330,663 | 3,656,861 | 8,216,035 | 662,794 |
| **The Kroger Co.** | Included above | 66,005,386 | 9,458,181 | 7,944,814 | 1,114,813 |
| **Walmart** | Included above | 30,193,554 | 4,030,007 | 3,859,600 | 487,405 |
| **TOTAL** | 100.00% | 15,268,801,060 | 1,730,627,401 | 1,744,195,586 | 197,492,840 |
| **Grand Total** | | | | | **1,928,120,241** |



Table 10. These top 26 companies selling or consuming Amazon oil represent 45% of the total production of Amazon oil in 2020.

| RANK | COMPANY | TOTAL EST. AMAZON CONSUMPTION (ALL FUEL TYPES) (GAL) | RANK | COMPANY | TOTAL EST. AMAZON CONSUMPTION (ALL FUEL TYPES) (GAL) |
|---|---|---|---|---|---|
| 1 | **UNBRANDED GAS** | 479,424,000 | 14 | amazon | 13,347,000 |
| 2 | Marathon Petroleum Corporation | 339,673,000 | 15 | ups | 13,101,000 |
| 3 | Chevron | 318,322,000 | 16 | FedEx | 12,115,000 |
| 4 | **HYPERMARKET RETAIL GAS** | 285,322,000 | 17 | Kroger | 10,940,000 |
| 5 | Shell | 209,627,000 | 18 | Alaska Airlines | 7,399,000 |
| 6 | Phillips 66 | 159,161,000 | 19 | Walmart | 6,764,000 |
| 7 | Valero | 58,230,000 | 20 | Albertsons Safeway | 4,717,000 |
| 8 | ExxonMobil | 54,348,000 | 21 | pepsi | 4,264,000 |
| 9 | American Airlines | 31,209,000 | 22 | Sysco | 3,405,000 |
| 10 | United Airlines | 30,051,000 | 23 | US. Foods | 2,266,000 |
| 11 | Delta | 30,000,000 | 24 | Reyes | 1,954,000 |
| 12 | Southwest | 24,181,000 | 25 | Coca-Cola | 560,000 |
| 13 | Costco Wholesale | 19,883,000 | 26 | unfi united natural foods | 551,000 |
| | **TOTAL EST. CONSUMPTION** | **2,120,812,000 GALLONS** | | | |

**BRANDS ARE 45% OF TOTAL EST. PRODUCTION OF FUEL FROM THE AMAZON RAINFOREST**

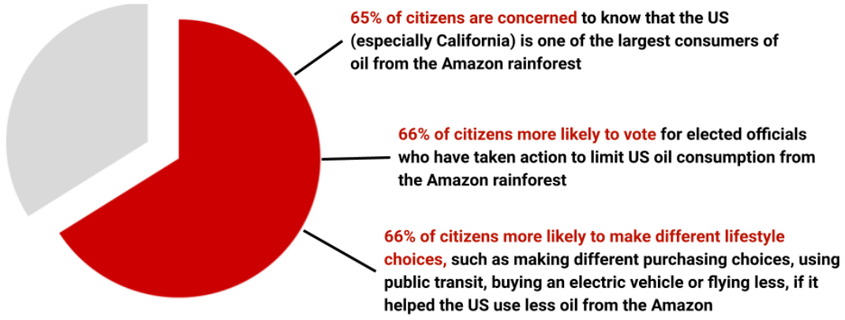
# RECOMMENDATIONS AND SOLUTIONS

## 1. Make eliminating Amazon oil a key climate action

The U.S. and California especially need to identify the consumption of Amazon oil not just as a threat to the future of the world's largest rainforest, but as a vital part of meeting their carbon reduction goals and climate change strategies. Net zero promises and commitments by 2050 do not go far enough to respond to the climate emergency facing the planet. In order to avoid the worst warming scenarios, government and corporate leaders must make concrete steps today for impacts that can be fully realized before the end of this decade. Oil expansion anywhere on the planet is incompatible with the scientific mandate to keep global warming under 1.5° C. The International Energy Agency (IEA) has called for an end to oil and gas expansion globally by the end of 2021, citing a lack of real necessity for new sources of fossil fuels.[119]

Yet plans to expand oil production in the southern blocks in the Ecuadorian Amazon are moving forward, and more oil wells are planned throughout the rainforests of Colombia, Ecuador, and Peru. Indigenous communities, calling for a just transition away from oil and gas, and impacted communities in California are leading the way by demanding environmental justice and the right to a clean environment. In fact, people across the U.S. want action and are willing to make changes to see real progress. A strong majority of concerned citizens in the U.S. want political leaders who will limit the consumption of oil from the Amazon. These citizens are also willing to make lifestyle choices that reduce the risk of destroying the rainforest (see Fig. 13).

Figure 13. Results of a national citizen poll conducted by Directions Research of over 1,000 individuals on Oct 11, 2021. Respondents represent a diverse demographic base across the US






Now, political, corporate, and agency leaders have an opportunity to ensure that California is committed to addressing its role in driving oil drilling and subsequent forest fragmentation and Indigenous rights violations in the Amazon.

**Companies using Amazon oil are responsible for eliminating fossil fuels, including those destroying the Amazon Rainforest. Corporate leaders need to:**

- Call for no new oil expansion in the Amazon
- Develop fuel sourcing policies that are transparent and traceable

**Government leaders need to be a force for change, with new policies, regulations, and commitments:**

- Commit California to a policy/regulatory agenda that ensures that California is not contributing to the expansion of oil drilling in the Amazon.
- Create a multi-agency commission to map out how the state can achieve this goal (without any increase of domestic Californian production)
- Present a plan for California to reduce and/or eliminate its consumption of crude from the Amazon.
- Provide funding and support to both the Ecuadorian government and Indigenous federations and nationalities to balance decades of impacts

## 2. Offset fuel demand with EVs and ramp-down refinery production

Using an average of 12,000 vehicle miles travelled (VMT) per year and an average mileage of 22.6 miles per gallon, it is estimated that a typical EV car could offset 531 gallons of gasoline per year. The total estimated amount of finished gasoline produced from Amazon oil in 2020, including the addition of 10% ethanol typical for gasoline produced in the state, is approximately 1.8 billion gallons. An additional 3.4 million EVs would need to be sold in California, above the total EV sales as of 2020 (approx. 800,000), to offset that amount today.[120] However, by modeling the uptake of EVs based on current demand, it is possible that if California added 200,000 new EVs per year, the reduction in demand would cancel out production of gas derived from the Amazon by mid-2026 (see Fig. 14).[121]

There are several caveats to this analysis, but the most important is that it assumes that the production of gasoline in the state will decrease with the EV offsets in response to declining domestic demand, and that refineries do not continue to produce similar volumes of refined fuels for export to other states and countries.[122] Communities for a Better Environment's 2019 analysis shows California's refineries could turn California into the "gas station of the Pacific" if exports of refined fuels are not restricted.[123] The effort to increase EVs on the road as a means of curbing California's demand for crude oil would have to be complemented by a major effort to ramp down refinery production in the state.

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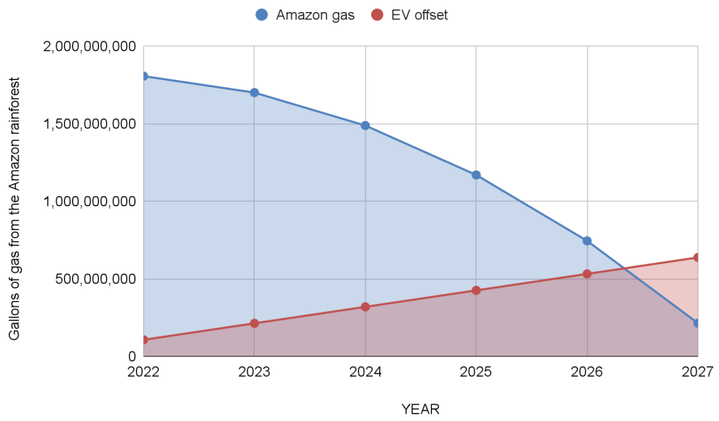
istock.com

Figure 14. A simplified model of EV uptake and possible decline in Amazon gasoline as EVs reduce gasoline production in the state over time.




While this might feel like wishful thinking, models of how refinery ramp-down could be engineered over a time scale suitable to minimize job loss and other economic disruptions have been developed. According to the CBE report "Decommissioning California's Refineries," California needs to reduce the amount of crude flowing through California refineries by 4.4% to 8.6% per year starting in 2021 in order to meet its climate commitments in the most just, least impactful way. [124] In approximately 10 years time, this gradual ramp down of refinery processing totals could level out at 10% to 20% of current throughput, while still allowing some capacity for refineries to continue to produce jet fuel as needed. If California committed to a 6% annual ramp down of refinery crude inputs, it could be entirely off of Amazon oil in two years even without the offsets from uptake of EVs described above. Additionally, less than one year later in a 6% ramp down scenario, California would no longer need the 10% of in-state oil production (less than 3% of the total oil California refines) from wells within close proximity of homes and areas of disproportionate pollution.[125]

**Corporate leaders who want to be part of the solution should:**

- Set aggressive goals for electric vehicle use and other strategies designed to reduce fossil fuel consumption
- Support government efforts to ramp down fossil fuel production in the state
- Support government efforts to gradually ramp down refinery processing amounts

**California's governments need to enact policies that include:**

- Refinery processing amount ramp - downs
- No new domestic production or within 3200 feet of buffer around homes, schools, and other sensitive receptors
- Commitment to push for electrification of fleets that consume the most Amazon oil, expansion of EVs broadly, and public transportation goals to reduce domestic consumption equivalent to Amazon oil import totals.

While California's historic connection to sustained demand for oil drilling in the Western Amazon is problematic, clear signaling and new commitments from state leaders can change this dynamic and have a critical influence on whether vast tracts of the Amazon are opened up for further oil drilling. It also presents an opportunity to accelerate a variety of decarbonization efforts already happening in California from EVs to Sustainable Aviation Fuels to fleet electrification, mass transit, high speed rail, and much more. Now is the time for clear and decisive leadership, our future and the fate of the Amazon depends on it.



# ANNEXES

## Annex 1. Amazon utilization rates and Amazon ratings

Utilization rates are the proportion of the total annual input of crude oil that comes from the Amazon Rainforest. Amazon ratings are the utilization rates multiplied by the production gain to estimate the proportion of annual outputs of refined products (gasoline, diesel, and jet fuel) that come from the Amazon.

| | 2020 | | 2019 | | 2018 | |
|---|---|---|---|---|---|---|
| | UTILIZATION RATE | AMAZON RATING | UTILIZATION RATE | AMAZON RATING | UTILIZATION RATE | AMAZON RATING |
| US | 1.8% | 1.9% | 1.8% | 1.96% | 1.4% | 1.5% |
| Michigan | 1.2% | 1.3% | 0.0% | 0.0% | 0.0% | 0.0% |
| Washington | 0.3% | 0.3% | 0.0% | 0.0% | 0.0% | 0.0% |
| Texas and Louisiana | 0.5% | 0.5% | 0.6% | 0.6% | 0.4% | 0.4% |
| California | 10.8% | 11.6% | 10.6% | 11.3% | 8.0% | 8.6% |
| - Northern California | 7.5% | 8.1% | 8.5% | 9.1% | 8.2% | 8.8% |
| - Central California | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| - Southern California | 13.9% | 14.9% | 12.7% | 13.6% | 8.2% | 8.8% |
| Chevron, El Segundo (CA) | 16.6% | 17.8% | 21.0% | 22.5% | 16.6% | 17.8% |
| Chevron, Richmond (CA) | 0.6% | 0.7% | 1.3% | 1.4% | 0.6% | 0.7% |
| Marathon, Martinez (CA) | 12.4% | 13.3% | 27.3% | 29.2% | 27.2% | 29.1% |
| PBF Energy, Martinez (CA) | 11.4% | 12.2% | 6.3% | 6.7% | 10.7% | 11.5% |
| PBF Energy, Torrance (CA) | 3.5% | 3.7% | 1.9% | 2.0% | 3.9% | 4.1% |
| Valero, Benicia (CA) | 15.6% | 16.7% | 8.3% | 8.9% | 3.2% | 3.4% |
| Phillips 66, Los Angeles (CA) | 9.0% | 9.7% | 12.0% | 12.9% | 7.2% | 7.7% |
| Phillips 66, San Francisco (CA) | 0.4% | 0.4% | 1.0% | 1.1% | 0.0% | 0.0% |
| Marathon, Los Angeles (CA) | 13.4% | 14.3% | 9.9% | 10.7% | 4.4% | 4.7% |
| Valero, Wilmington (CA) | 35.3% | 37.9% | 21.2% | 22.8% | 8.6% | 9.2% |
| Kern Oil, Bakersfield (CA) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| San Joaquin Refining, Bakersfield (CA) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Greka Energy, Santa Maria (CA) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| World Oil Corp., South Gate (CA) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| ExxonMobil, Baytown (TX) | 0.0% | 0.0% | 0.2% | 0.2% | 0.2% | 0.2% |
| Marathon, Galveston Bay (TX) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| ExxonMobil, Beaumont (TX) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Deer Park Refining, Deer Park (TX) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Flint Hills Resources, Corpus Christi (TX) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Valero, Port Arthur (TX) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Motiva, Port Arthur (TX) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Houston Refining, Houston (TX) | 1.7% | 1.8% | 2.4% | 2.6% | 0.4% | 0.4% |
| Phillips 66, Sweeny (TX) | 2.1% | 2.2% | 1.4% | 1.5% | 7.1% | 7.6% |
| Total SA, Port Arthur (TX) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Valero, Texas City (TX) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Valero, McKee (TX) | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| CITGO, Corpus Christi (TX) | 6.7% | 7.1% | 10.3% | 11.1% | 4.6% | 4.9% |
| CITGO, Lake Charles (LA) | 2.9% | 3.1% | 3.6% | 3.9% | 0.3% | 0.4% |
| Phillips 66, Lake Charles (LA) | 3.2% | 3.5% | 3.3% | 3.5% | 0.9% | 1.0% |
| Marathon, Detroit (MI) | 1.2% | 1.3% | | 0.0% | | 0.0% |
| Chevron, Pascagoula (MS) | 0.5% | 0.5% | | 0.0% | | 0.0% |

# Annex 2. Fuel consumption methodologies

The estimated volumes of refined product outputs from refineries are 'feedstocks' that are not yet blended. Amazon utilization rates and Amazon ratings calculate volumes of crude oil inputs and refined fuel feedstock outputs and do not account for blending. Blending may add 10% – 14% to the final volume of 'finished' gasoline.[126] However, since the ratio is not as clearly defined for jet fuel and diesel, it was not worked into the Amazon ratings. Fuel consumption estimates are calculated on the reported volumes of finished fuels, including additives and detergents, and all final Amazon fuel consumption estimates are inclusive of any additives and detergents.

**Airports and airlines**
The total annual consumption of jet fuel in 2020 was researched for both Los Angeles International (LAX) and San Francisco International (SFO). Recent reported figures for LAX's total jet fuel consumption are not available, so the jet fuel consumption estimate is extrapolated from reported consumption in 2000, 2012, and estimates reported for 2015 and calculated for 2020 based on the reduction in flights between 2019 and 2020, to account for the impact that COVID-19 restrictions had on air travel in 2020.[127] For SFO, the fuel consumption estimate was extracted from DataSF using their open data platform.[128] The top airlines for each airport were identified by their market share, which is based on total revenue passengers per airline for 2020 and weighted 2:1 for revenue passengers on international flights vs. domestic flights in order to account for each airline's ratio of international to domestic flights.[129] The total fuel consumption per airline at the airport was the airport's total consumption multiplied by the airline's market share. The proportion of this estimate that is derived from Amazon oil was calculated based on the airport's Amazon rating for 2020 (16.9% for LAX; 8.1% for SFO).

Additionally, BTS stats on airline fuel consumption were used to calculate each airline's total Amazon fuel consumption across the U.S., using the U.S. Amazon rating for 2020 of 1.9%.[130] The airline's Amazon jet fuel consumption at the airport was taken as a ratio of their total Amazon jet fuel consumption nationally in order to estimate the total Amazon jet fuel consumption that could be attributed to their hubs at LAX and SFO.

For Amazon Air, the methodology relied on statistics about the type of aircraft and flights per day from each of the seven airports used by Amazon Air in California.[131] Average fuel consumption per aircraft type was calculated using a basic fuel consumption rate per aircraft type over a standard medium-haul flight of 3000 km (1864 miles) and lasting about 4 hrs (e.g. a flight from LAX to Chicago).[132] This flight time was selected based on the typical journey times for the aircraft types used by Amazon Air in California. By multiplying the jet fuel consumption by the number of daily domestic flights and then by the Amazon rating at each airport (16.9% for Southern California airports; 8.1% for Northern), estimates for the use of jet fuel derived from the Amazon rainforest were created.

**Fleets**
An average of 20,500 gallons per year per tractor was applied to each company's total number of tractors reported for 2020 to get an estimate of diesel fuel consumption for their medium and heavy duty trucking fleets. The International Council on Clean Transportation (ICCT) and the American Transport Research Institute (ATRI) fuel economy estimates for medium to heavy duty tractors (40.4 L/100km and 6.5 mpg respectively) work out to between 22,000 – 25,000 gallons per tractor per year. More conservative estimates of 20,500 gallons per year are quoted in Fleet America and other sources. Given the differences in numbers and their effect on the estimates, the most conservative number was used.[133] The U.S. Amazon rating of 1.9% was applied to this estimate to get the proportion of diesel derived from crude oil extracted in the Amazon rainforest. The U.S. rating was used because the fleet estimates were not broken down by state.

**Retail gas**
The estimate of the volume of finished gasoline derived from the Amazon was calculated by taking the gasoline market share by fuel brand for California and multiplying it by the total sales reported on CEC-A15 results and then calculating the Amazon share using the average Amazon rating for California.[134] For supermarket retail gas (Costco, Safeway, Walmart, and Kroger) the total number of gas stations owned by each company in the state were mapped into the three distribution basins (north, central, south California) and given the average Amazon rating for that basin. The total fuel sales were based on multiplying the average volume of sales per gas station with the total number of stations. The average volume of sales per station is calculated using the California Retail Fuel Outlet Annual Reporting (CEC-A15) Results for 2020.[135] The estimated proportion of the finished gasoline that came from the Amazon rainforest is the total fuel sales multiplied by the Amazon rating.

# Annex 3. Top 100 companies included in the research, by Amazon fuel consumption

This is not an exhaustive list of companies that may be consuming Amazon oil, as not all companies and gallons of refined fuel were assessed. Out of a total estimated volume of refined fuel derived from the Amazon rainforest of 4.1 billion gallons per year, 59% (2.4 billion gallons) are accounted for in the fuel consumption analysis. Given the major undertaking to calculate fuel consumption, strategic focus was placed on airlines, supermarkets, retail gas and diesel, and medium to heavy duty fleets, especially their operations in California. Products other than gasoline, diesel, and jet fuel were also not assessed per company, although the estimated U.S. total and subset for California have been calculated. All figures are estimates, in gallons per year.

| | FINISHED GASOLINE | DIESEL | JET FUEL | OTHER PRODUCTS | TOTAL |
|---|---|---|---|---|---|
| **EST. TOTAL US PRODUCTION** | 2,503,000,000 | 862,000,000 | 657,000,000 | 82,000,000 | 4,104,000,000 |
| **EST. TOTAL CALIFORNIA PRODUCTION** | 1,637,000,000 | 564,000,000 | 429,000,000 | 54,000,000 | 2,684,000,000 |
| **EST. TOTAL GALLONS ASSESSED** | 1,744,000,000 | 535,000,000 | 135,000,000 | 0 | 2,414,000,000 |

*ALL FIGURES ARE ESTIMATES IN GALLONS PER YEAR*

| RANK | COMPANY | COMPANY TYPE | CATEGORY | FINISHED GASOLINE | DIESEL | JET FUEL | OTHER PRODUCTS | TOTAL |
|---|---|---|---|---|---|---|---|---|
| 1 | Unbranded Gas | - | Retail gas and diesel | 430,252,300 | 49,171,700 | - | - | 479,424,000 |
| 2 | ARCO (Marathon) | Major gas brand | Retail gas and diesel | 304,834,700 | 34,838,200 | - | - | 339,672,900 |
| 3 | Chevron | Major gas brand | Retail gas and diesel | 285,673,600 | 32,648,400 | - | - | 318,322,000 |
| 4 | *Hypermarkets* *(excluding those listed individually)* | Supermarket | Retail gas and diesel | 256,904,900 | 28,417,200 | - | - | 285,322,100 |
| 5 | Shell | Major gas brand | Retail gas and diesel | 188,126,500 | 21,500,200 | - | - | 209,626,700 |
| 6 | 76 (Phillips 66) | Major gas brand | Retail gas and diesel | 142,836,800 | 16,324,200 | - | - | 159,161,000 |
| 7 | Valero | Major gas brand | Retail gas and diesel | 52,257,400 | 5,972,300 | - | - | 58,229,600 |
| 8 | Exxon Mobil | Major gas brand | Retail gas and diesel | 48,773,500 | 5,574,100 | - | - | 54,347,700 |
| 9 | American Airlines | Airline | Airline | - | - | 31,208,900 | - | 31,208,900 |
| 10 | United Air Lines Inc | Airline | Airline | - | - | 30,051,200 | - | 30,051,200 |
| 11 | Delta Air Lines | Airline | Airline | - | - | 30,000,300 | - | 30,000,300 |
| 12 | Southwest Airlines | Airline | Airline | - | - | 24,181,000 | - | 24,181,000 |
| 13 | Costco Wholesale Corp. | Supermarket | Retail gas and diesel | 17,310,800 | 2,383,700 | - | - | 19,694,500 |
| 14 | UPS | Parcel Delivery | Leaser fleet | - | 13,101,400 | - | - | 13,101,400 |
| 15 | Amazon.com | Airline | Airline | - | - | 12,918,300 | - | 12,918,300 |
| 16 | FedEx Corp. | Parcel Delivery | Leaser fleet | - | 12,114,700 | - | - | 12,114,700 |
| 17 | The Kroger Co. | Supermarket | Retail gas and diesel | 9,458,200 | 1,114,800 | - | - | 10,573,000 |
| 18 | Knight-Swift Transportation Holdings | General Freight | Leaser fleet | - | 8,486,200 | - | - | 8,486,200 |
| 19 | Penske | General Freight | Leaser fleet | - | 7,842,600 | - | - | 7,842,600 |
| 20 | J B Hunt | General Freight | Leaser fleet | - | 6,810,000 | - | - | 6,810,000 |
| 21 | Alaska Airlines | Airline | Airline | - | - | 6,764,200 | - | 6,764,200 |
| 22 | YRC Worldwide Inc. | General Freight | Leaser fleet | - | 5,420,400 | - | - | 5,420,400 |
| 23 | Schneider National Carriers | General Freight | Leaser fleet | - | 5,391,900 | - | - | 5,391,900 |
| 24 | TransForce Inc. | General Freight | Leaser fleet | - | 4,571,100 | - | - | 4,571,100 |
| 25 | Walmart | Supermarket | Retail gas and diesel | 4,030,000 | 487,400 | - | - | 4,517,400 |
| 26 | R L Carriers | General Freight | Leaser fleet | - | 4,415,400 | - | - | 4,415,400 |
| 27 | Albertsons (including Safeway) | Supermarket | Retail gas and diesel | 3,656,900 | 662,800 | - | - | 4,319,700 |
| 28 | Pepsi | Food and beverage Company | Private fleet | - | 4,263,600 | - | - | 4,263,600 |
| 29 | Landstar System | General Freight | Leaser fleet | - | 4,087,600 | - | - | 4,087,600 |
| 30 | Werner Enterprises Inc. | General Freight | Leaser fleet | - | 3,774,900 | - | - | 3,774,900 |
| 31 | Old Dominion Freight Line Inc. | General Freight | Leaser fleet | - | 3,561,500 | - | - | 3,561,500 |
| 32 | Sysco | Food and beverage Company | Private fleet | - | 3,405,000 | - | - | 3,405,000 |
| 33 | Estes | General Freight | Leaser fleet | - | 3,102,100 | - | - | 3,102,100 |
| 34 | Walmart | Supermarket | Private fleet | - | 2,881,300 | - | - | 2,881,300 |



| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 36 | Evans Network of Companies | General Freight | Leaser fleet | - | 2,738,800 | - | - | 2,738,800 |
| 37 | Daseke Inc. | Heavy Hauling | Leaser fleet | - | 2,604,900 | - | - | 2,604,900 |
| 38 | US Xpress Enterprises Inc. | General Freight | Leaser fleet | - | 2,589,700 | - | - | 2,589,700 |
| 39 | Kenan Advantage Group | Tank Truck | Leaser fleet | - | 2,383,700 | - | - | 2,383,700 |
| 40 | Halliburton Co. | Oil and Gas | Private fleet | - | 2,375,500 | - | - | 2,375,500 |
| 41 | CRST International Inc. | General Freight | Leaser fleet | - | 2,284,400 | - | - | 2,284,400 |
| 42 | US Foods | Food and beverage Company | Private fleet | - | 2,266,500 | - | - | 2,266,500 |
| 43 | Crete Carrier Corp. Shaffer Trucking | General Freight | Leaser fleet | - | 2,187,500 | - | - | 2,187,500 |
| 44 | Ryder Integrated Logistics Inc. | General Freight | Leaser fleet | - | 1,965,500 | - | - | 1,965,500 |
| 45 | UniGroup Inc. | Household Goods | Leaser fleet | - | 1,955,800 | - | - | 1,955,800 |
| 46 | Reyes Holdings | Food and beverage Company | Private fleet | - | 1,954,200 | - | - | 1,954,200 |
| 47 | Averitt | General Freight | Leaser fleet | - | 1,947,600 | - | - | 1,947,600 |
| 48 | SAIA | General Freight | Leaser fleet | - | 1,942,900 | - | - | 1,942,900 |
| 49 | Performance Food Group | Food and beverage Company | Private fleet | - | 1,835,900 | - | - | 1,835,900 |
| 50 | Heartland Express | General Freight | Leaser fleet | - | 1,809,000 | - | - | 1,809,000 |
| 51 | C R England Inc. | Refrigerated Solids | Leaser fleet | - | 1,752,100 | - | - | 1,752,100 |
| 52 | ArcBest Corp. | General Freight | Leaser fleet | - | 1,621,700 | - | - | 1,621,700 |
| 53 | Hub Group Trucking | General Freight | Leaser fleet | - | 1,595,600 | - | - | 1,595,600 |
| 54 | McLane Co. | Food and beverage Company | Private fleet | - | 1,513,100 | - | - | 1,513,100 |
| 55 | Schlumberger Limited | Oil and Gas | Private fleet | - | 1,422,000 | - | - | 1,422,000 |
| 56 | NFI Transportation | General Freight | Leaser fleet | - | 1,412,600 | - | - | 1,412,600 |
| 57 | Covenant Transportation Group | General Freight | Leaser fleet | - | 1,398,600 | - | - | 1,398,600 |
| 58 | Southeastern Freight Lines | General Freight | Leaser fleet | - | 1,344,900 | - | - | 1,344,900 |
| 59 | Ruan | General Freight | Leaser fleet | - | 1,301,300 | - | - | 1,301,300 |
| 60 | PS Logistics | Heavy Hauling | Leaser fleet | - | 1,249,100 | - | - | 1,249,100 |
| 61 | Central Transport Inc. | General Freight | Leaser fleet | - | 1,238,200 | - | - | 1,238,200 |
| 62 | Cardinal Logistics Management Corp. | General Freight | Leaser fleet | - | 1,228,800 | - | - | 1,228,800 |
| 63 | Quality Carriers | Tank Truck | Leaser fleet | - | 1,186,400 | - | - | 1,186,400 |
| 64 | KLLM Transport Services LLC | General Freight | Leaser fleet | - | 1,181,300 | - | - | 1,181,300 |
| 65 | Forward Air Corp./FAF Inc. | General Freight | Leaser fleet | - | 1,153,300 | - | - | 1,153,300 |
| 66 | Universal Truckload Services Inc./UTSI | General Freight | Leaser fleet | - | 1,150,200 | - | - | 1,150,200 |
| 67 | USA Truck Inc. | General Freight | Leaser fleet | - | 1,149,400 | - | - | 1,149,400 |
| 68 | Marten Transport Ltd. | Refrigerated Solids | Leaser fleet | - | 1,138,100 | - | - | 1,138,100 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 70 | United Road and United Road Services Inc. | Motor Vehicle | Leaser fleet | - | 1,109,700 | - | - | 1,109,700 |
| 71 | FirstFleet Inc. | General Freight | Leaser fleet | - | 1,108,500 | - | - | 1,108,500 |
| 72 | NexTier Oilfield Solutions | Oil and Gas | Private fleet | - | 1,074,300 | - | - | 1,074,300 |
| 73 | TMC | Building Materials | Leaser fleet | - | 1,071,500 | - | - | 1,071,500 |
| 74 | XPO Logistics LLC | General Freight | Leaser fleet | - | 1,051,300 | - | - | 1,051,300 |
| 75 | Mercer Transportation Co. Inc. | General Freight | Leaser fleet | - | 1,034,500 | - | - | 1,034,500 |
| 76 | Tyson Foods | Food and beverage Company | Private fleet | - | 1,028,700 | - | - | 1,028,700 |
| 77 | AAA Cooper Transportation | General Freight | Leaser fleet | - | 1,016,200 | - | - | 1,016,200 |
| 78 | Hogan Group of Companies | General Freight | Leaser fleet | - | 952,000 | - | - | 952,000 |
| 79 | US 1 Industries | General Freight | Leaser fleet | - | 904,500 | - | - | 904,500 |
| 80 | Cowan Systems LLC | General Freight | Leaser fleet | - | 890,900 | - | - | 890,900 |
| 81 | United Rentals Inc. | Rental Trucks | Private fleet | - | 877,200 | - | - | 877,200 |
| 82 | RoadOne Intermodalogistics | General Freight | Leaser fleet | - | 869,500 | - | - | 869,500 |
| 83 | Canada Cartage System, LP | General Freight | Leaser fleet | - | 851,900 | - | - | 851,900 |
| 84 | Roehl Transport Inc. | General Freight | Leaser fleet | - | 846,100 | - | - | 846,100 |
| 85 | Basic Energy Services | Oil and Gas | Private fleet | - | 839,500 | - | - | 839,500 |
| 86 | Black Horse Carriers Inc. | Refrigerated Solids | Leaser fleet | - | 820,400 | - | - | 820,400 |
| 87 | Roadrunner Transportation Systems Inc. | General Freight | Leaser fleet | - | 814,600 | - | - | 814,600 |
| 88 | Pitt Ohio Transportation Group | General Freight | Leaser fleet | - | 813,800 | - | - | 813,800 |
| 89 | SIRVA Inc. | Household Goods | Leaser fleet | - | 812,600 | - | - | 812,600 |
| 90 | Dart Transit Co. | General Freight | Leaser fleet | - | 797,800 | - | - | 797,800 |
| 91 | Anderson Trucking Service Inc. | General Freight | Leaser fleet | - | 792,700 | - | - | 792,700 |
| 92 | Gordon Food Service | Food and beverage Company | Private fleet | - | 776,000 | - | - | 776,000 |
| 93 | Atlas Van Lines Inc. | Household Goods | Leaser fleet | - | 767,800 | - | - | 767,800 |
| 94 | Stevens Transport Inc. | Refrigerated Solids | Leaser fleet | - | 760,400 | - | - | 760,400 |
| 95 | Platinum Supply Chain Solutions | Refrigerated Solids | Leaser fleet | - | 733,200 | - | - | 733,200 |
| 96 | Eagle Express Lines Inc. | General Freight | Leaser fleet | - | 723,100 | - | - | 723,100 |
| 97 | Trimac Transportation Group Inc. | Bulk Commodities | Leaser fleet | - | 716,800 | - | - | 716,800 |
| 98 | Pam Transport Inc. | General Freight | Leaser fleet | - | 668,500 | - | - | 668,500 |
| 99 | CHS Inc. | Food and beverage Company | Private fleet | - | 644,800 | - | - | 644,800 |
| 100 | Maverick Transportation LLC | General Freight | Leaser fleet | - | 644,400 | - | - | 644,400 |



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Stand is an advocacy organization that brings
people together to demand that corporations and
governments put people and the environment first
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