COLORADO
EMISSIONS ANALYSIS

CONSUMER ENERGY ALLIANCE
THE VOICE OF THE ENERGY CONSUMER

COLORADO EMISSIONS ARE DECLINING, LEADING TO AN IMPROVED ENVIRONMENT

While the nation's increased energy production has received a great deal of media focus in recent years, little notice has been paid to the significant emission reductions and overall environmental improvements that were set in motion back in 2014, when then Colorado Governor John Hickenlooper, the Environmental Defense Fund (EDF) and three of the state's largest producers adopted what the group lauded as "landmark regulations" in air quality in Colorado, which has been used as a standard across the nation and around the world. Even as emissions have continued to decrease, Colorado lawmakers adopted additional oversight in early 2019 in the name of public health as a way to further solidify additional decreases in emissions, specifically in the Denver Metropolitan area.

The World Health Organization identifies outdoor air emissions as "a major cause of death and disease globally" and attributes emissions such as particulate matter (PM), ozone (formed by volatile organic compounds (VOCs), nitrogen oxides (NOx) and sulfur dioxide (SO2) to lung cancer, respiratory infection, heart disease and stroke. The economic impacts of these air emissions include increased health care costs, decreased labor productivity, and declining agricultural crop yields.

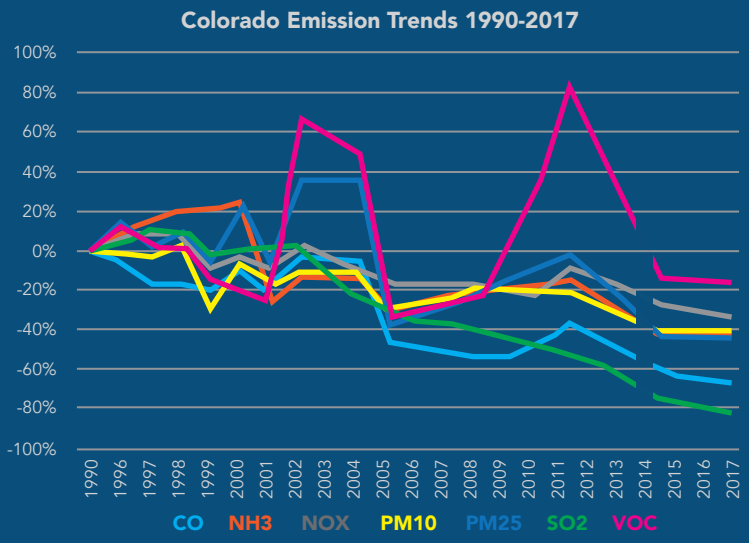

Figure 1. Colorado Emission Trends 1990-2017 (Source: U.S. Environmental Protection Agency) NOTE - 2014 EPA emissions data omitted due to reporting error

Emissions of key air pollutants and greenhouse gases have declined significantly across the state, even though Colorado remains a large energy consumer:

From 1990 to 2017, Colorado's emissions of key pollutants have decreased across the board:

- 35 percent reduction in nitrogen oxides (NOx)
- 17 percent reduction in volatile organic compounds (VOCs)
- 81 percent reduction in sulfur dioxide (SO2)
- 66 percent reduction in carbon monoxide (CO)
- 43 percent reduction in fine particulate matter (PM2.5)
- 41 percent reduction in coarse particulate matter (PM10)
- 43 percent reduction in ammonia (NH3)

Additionally, from 2007 to 2016, Colorado's carbon dioxide (CO2) emissions declined 10 percent. These emissions reductions are remarkable in light of Colorado's growth from 1990 to 2017, including:

- A 364 percent increase in the state's gross domestic product (GDP)
- A 16 percent increase in vehicle miles traveled per capita
- A 70 percent increase in population

Colorado's cleaner air means that the state's wildlife and natural assets will be protected. This ensures that tourism, a $22.3 billion industry for the state, will continue to thrive. Not only that, Colorado's families and children can enjoy all their state has to offer more healthily, from winter skiing to spring hiking trips.

Additionally, improved air quality means that Colorado's 36,000 farms and ranches spread across 66 million acres will keep generating almost $7.7 billion annually in crops and livestock for the state's economy. This means that Colorado cattle, wheat and dairy will continue to be distributed to families and businesses across the state and the nation.

COLORADO ECONOMIC GROWTH

With a young and rapidly growing workforce, Colorado is set to outperform U.S. economic growth again in 2020, as it has in previous years. Colorado can boast that it is ranked third in the nation for its concentration of high-tech workers, fourth for start-up activity and the second-largest aerospace economy in the U.S. Colorado's manufacturing sector is also a significant driver of the state's economy and is responsible for an expansive range of products across a broad range of businesses including energy, biomedical research and food and beverage. Colorado is also home to more than 400 aerospace companies researching space exploration and travel.

COLORADO ENERGY CONSUMPTION

Almost 80 percent of Colorado's energy needs are met by oil and natural gas. Colorado's transportation sector utilizes more than 80 percent of the petroleum consumed within the state, and the state's high demand for petroleum outpaces its production capacity. Several pipelines, along with rail and truck transport, are needed to supply the Colorado market with petroleum products from Wyoming, Kansas and Texas.

The state's residential sector is the largest natural gas user – accounting for almost one-third of the state's consumption, with seven out of ten Colorado households relying on natural gas as their primary heating source. Additionally, Colorado's electric utilities have increased their use of natural gas by 16 percent since 2001.

COLORADO ENERGY PRODUCTION

Colorado holds 4 percent of the nation's oil reserves and produces about 4 percent of U.S. crude oil. New, efficient technologies have enabled Colorado to quadruple production of crude oil during the last decade. The state is currently home to one oil refinery. Due to increased production rates, more interstate pipelines are necessary to move Colorado crude oil to out-of-state refineries.

Colorado has the sixth-largest reserve of natural gas in the U.S. and is among the top five gas-producing states in the nation. Colorado delivers natural gas supplies to almost a dozen states, spanning from California to West Virginia via several major interstate pipeline systems.

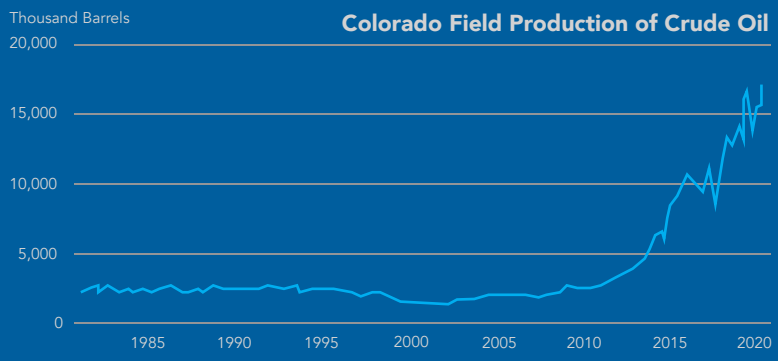

Figure 2. Colorado Field Production of Crude Oil (Source: U.S. Energy Information Administration)

U.S. EMISSIONS ARE DECLINING TOO

Rigorous environmental standards and energy production can and do coexist. U.S. oil and gas companies banded together to form The Environmental Partnership to improve environmental performance and further reduce emissions of methane and volatile organic compounds. These improvements are occurring at a time when our country has catapulted forward to become the world's leading producer of oil and natural gas.

Worldwide energy-related CO2 emissions increased 1.7 percent in 2018. The U.S. stands in stark contrast to global trends, leading the world in reductions by lowering energy-related CO2 emissions by 2.1 percent in 2019. The Energy Information Administration forecasts these emissions will decrease by 2 percent in 2020 and 1.5 percent in 2021. These reductions are in large part due to U.S. usage of natural gas.

Consumer Energy Alliance (CEA) works to support and advocate for the continued development of a balanced energy portfolio, including oil and natural gas as well as other traditional and renewable energy sources. CEA also recognizes the vital role that transportation infrastructure like pipelines and transmission lines serve, as they are critical for moving energy throughout Colorado and the rest of the country.

With the emission reductions that have occurred recently, Colorado policymakers, regulators and leaders must come together in support of access to reliable energy resources and infrastructure development that will keep the state thriving, and ensure that hard-working families, seniors, households and small businesses can continue to enjoy the benefits of American energy.

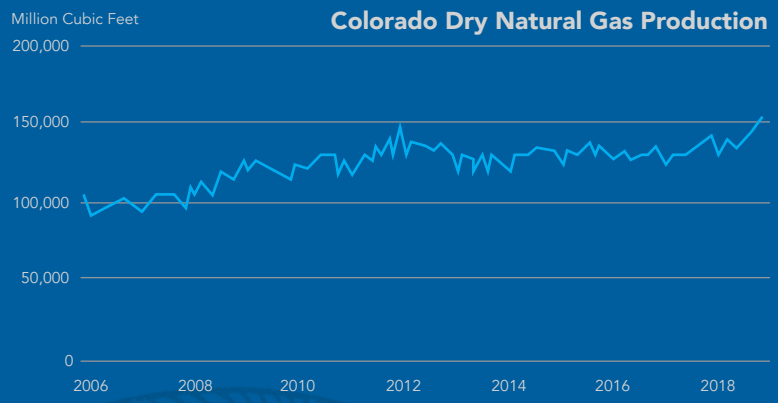

Figure 3. Colorado Dry Natural Gas Production (Source: U.S. Energy Information Administration)

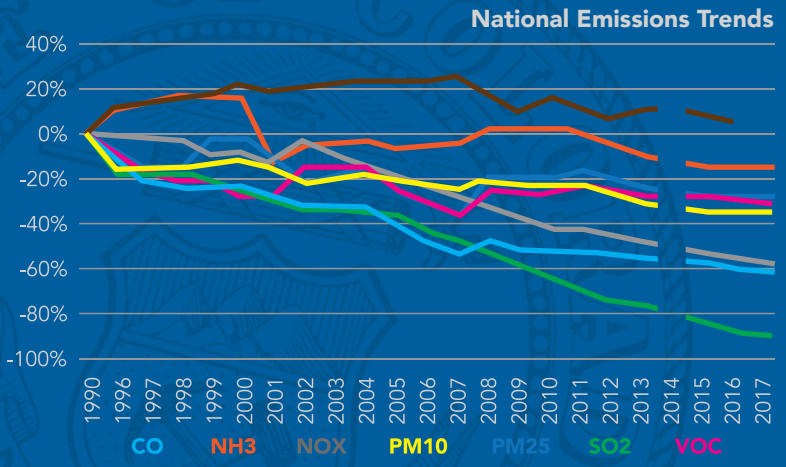

Figure 4. National Emission Trends 1990-2017. (Sources: U.S. Environmental Protection Agency and Energy Information Administration) NOTE - 2014 EPA emissions data omitted due to reporting error.

World Health Organization, https://www.who.int/airpollution/ambient/health-impacts/en/
OECD, The Consequences of Outdoor Air Pollution, https://www.oecd.org/environment/indicators-modelling-out-looks/Policy-Highlights-Economic-consequences-of-outdoor-air-pollution-web.pdf
EPA State Annual Emissions Trend. https://www.epa.gov/sites/production/files/2018-07/state_tier1_caps.xlsx
EIA, State Carbon Dioxide Emissions Data. https://www.eia.gov/environment/emissions/state/
Bureau of Economic Analysis, Regional Data – GDP and Personal Income, https://apps.bea.gov/itable/iTable.cfm?ReqID=70&step=1
U.S. VMT Per Capita by State, 1981-2017. https://www.enotrans.org/wp-content/uploads/2019/06/VMT-per-capita-by-state-1981-2017-1.pdf
U.S. Census Bureau., https://www.census.gov/
Colorado Tourism at a Glance. https://industry.colorado.com/sites/default/files/CTO-infographic_PRINT.pdf
Colorado Agriculture By the Numbers https://www.farmflavor.com/colorado-agriculture/
Fifty-Fifth Annual Colorado Business Outlook 2020. https://coloradosun.com/wp-content/uploads/sites/15/2019/12/2020-BEOF-Book-FINAL-Printable-Full-Book.pdf
Colorado Office of Economic Development and International Trade – Industries. https://choosecolorado.com/key-industries/
Colorado End-use energy consumption 2017, estimates. https://www.eia.gov/beta/states/states/co/overview
Colorado Energy Analysis. https://www.eia.gov/beta/states/states/co/analysis
Id.
Id.
International Energy Agency Global Energy & CO2 Status Report 2019, https://www.iea.org/reports/global-energy-and-co2-status-report-2019/emissions
EIA Short Term Energy Outlook, January 2020 https://www.eia.gov/outlooks/steo/archives/jan20.pdf

CONSUMER ENERGY ALLIANCE
THE VOICE OF THE ENERGY CONSUMER