



To: Colorado Senate, Transportation & Energy Committee

From: Mike Hennen, RMI

Date: April 28, 2021

Subject: Testimony in support of SB21-246

SB21-246 is an important bill for advancing Colorado's path forward to meeting the climate goals laid out in HB19-1261. It will jumpstart critical market development for new clean energy technologies that will replace fossil fuels in Colorado's homes and businesses with clean electricity. These technologies – modern heat pumps, advanced water heaters, and others – are a critical piece of the successful scenarios for 50% emissions cuts by 2030 and 90% by 2050 laid out in the Colorado GHG Emissions Reduction Roadmap. These technologies also improve indoor air quality and increase the safety of Colorado homes. Provisions in this bill also support development of high quality jobs installing new technologies. SB21-246 presents an important opportunity to advance Colorado's leadership in climate action and set an example for others to follow.

The role of beneficial electrification of buildings in the Colorado GHG Pollution Reduction Roadmap

Colorado's Greenhouse Gas Pollution Reduction Roadmap laid out a path toward achieving the state's goals of a 50 percent reduction in carbon emissions by 2030 and 90 percent by 2050. The roadmap takes stock of Colorado's emissions across sectors, such as transportation, electricity, and buildings. It then identifies a series of policy actions needed to meet the state's climate targets while minimizing the social, economic, and health impact on communities.

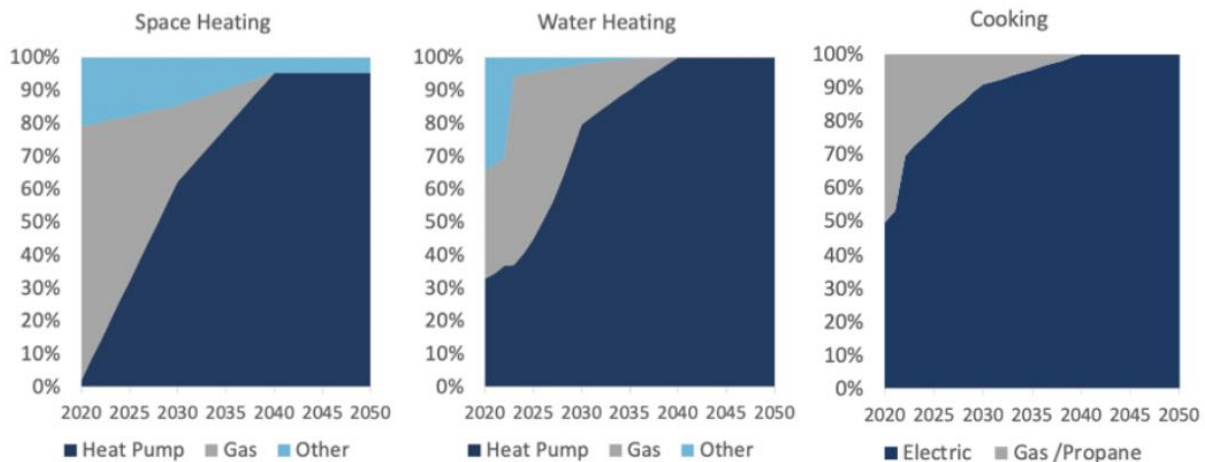
While transportation and electricity are the state's two largest contributors to climate change, the roadmap recognizes the importance of decarbonizing the state's building sector. Buildings are responsible for [28 percent](#) of the state's carbon emissions, with 9 percent stemming from burning fossil fuels to heat space and water and the remainder from electricity. The roadmap is clear that current policies do not put the state on track to meet its 2025 and 2030 emissions reduction goals and that more action will be needed across all sectors.

The roadmap proposes dramatic changes in the buildings sector. The detailed analysis underlying the roadmap portrays a primary scenario complying with HB19-1261 that relies on almost a full phase-out of gas for space and water heating as well as ambitious market development strategies. Heat pumps (including hybrid systems that retain a small amount of gas usage) would comprise over 60 percent of residential heating equipment sales by 2030 and over 95 percent by 2040, up from 2 percent today. This will require a major market transformation. Sales of gas furnaces and boilers would peak in 2021 before starting a steep decline to zero. Commercial heating equipment sales would transform even more quickly. By 2050, more than 90 percent of space and water heating would be electric across Colorado's buildings.



The figure below illustrates the rate of market transformation for clean heating and cooking products envisioned in the modeled scenario underlying the roadmap.

Equipment sales shares in single family residential buildings



However, today’s market for these important technologies is not well developed in Colorado, and support through new utilities programs is vital to successful market development. Homeowners and businesses do not yet have clear programs supporting their adoption of these technologies, and awareness of their benefits is low even among many contractors.

Benefits of modern electrification technologies

Affordability

Today, heat pumps can already offer cost savings in several situations. The customers and buildings which represent the greatest opportunity for cost savings include those that heat with propane or older electric heating technologies, as well as new construction. Programs aimed at upgrading existing electric heating customers to modern heat pumps can be highly valuable to heating sector decarbonization even though they do not displace direct fossil fuel use, as they reduce electricity demands and grid impacts and help develop local markets for new heat pump technologies. Customers currently using natural gas for heating have less access today to attractive options for converting their homes and businesses to new electric technologies, which is why market development programs like those offered through SB21-246 are important to make more cost-effective options available to consumers across Colorado.

Health

As part of a broader transition away from natural gas and other fossil fuels in buildings, efficient electric technologies can improve the health and safety of homes across Colorado. Natural gas combustion produces nitrogen dioxide (NO₂) and other pollutants which are harmful to human health. Indoor cooking with gas is particularly problematic as these pollutants are often not vented outdoors and contribute to elevated pollution levels indoors which can exceed the safe standards set by the EPA for outdoor



exposure.¹ According to an MIT study on air pollution, in 2018 the emissions from the combustion of fossil fuels in buildings were the number one cause of premature deaths and lead to almost 28,000 deaths annually across the US.

The majority of Coloradoans live in communities where it is regularly unsafe to breathe,² and the burning of fossil fuels in buildings is a major contributor to this problem. The EPA recently downgraded Denver and eight other Front Range countries from “moderate” to “serious” demonstrating the lack of compliance with agency standards. Emissions of nitrogen oxides (“NOx”)—including nitrogen dioxide (“NO₂”)—from burning fossil fuels in buildings are a significant contributor to Colorado’s air pollution problems. The burning of gas produces NO₂ pollution, and NOx is also a precursor to other dangerous pollutants, including both ozone and fine particulates (“PM_{2.5}”).³

Living in a home with a gas stove increases the risk of asthma in children, relative to those children who live in homes with electric stoves. A gas stove in the home increases the risk of experiencing asthma symptoms by 42%.⁴ Meanwhile, having a gas stove increases the risk of being diagnosed with asthma by a doctor by 24%.⁵

In sum, new technologies like heat pumps and induction cooktops present a valuable opportunity to advance Colorado’s climate goals and improve Coloradans’ health. Realizing the full benefits of these technologies will require market development and new programs, and SB21-246 provides those. This bill will be an important step forward toward a safe climate future for all Coloradans.

Respectfully,

Mike Hennen
Principal, RMI

¹ <https://rmi.org/insight/gas-stoves-pollution-health/>

² <https://www.cpr.org/2019/08/09/front-range-fails-to-meet-epa-air-quality-rulesagain/#:~:text=Denver%20and%20Northern%20Colorado's%20urban,was%20expected%20after%20Democratic%20Gov.>

³ California Air Resources Board, Nitrogen Dioxide & Health (2020), available at <https://ww2.arb.ca.gov/resources/nitrogendioxide-and-health>

⁴ Weiwei Lin et al., Meta-Analysis of the Effects of Indoor Nitrogen Dioxide and Gas Cooking on Asthma and Wheeze in Children, 42 INTERNATIONAL JOURNAL OF EPIDEMIOLOGY 1724 (2013), available at <https://doi.org/10.1093/ije/dyt150>.

⁵ Ibid.

Oppose SB21-264 | Adopt Programs Reduce Greenhouse Gas Emissions Utilities

Dear Colorado Senate Transportation and Energy committee members. My name is Ron Bennett and I reside in Boulder. I'm an architect who's focused on decarbonizing the building sector. I'm submitting this written testimony on behalf of 350 Colorado and it's 20,000 members statewide.

350 Colorado opposes senate bill 264 as it is incompatible with 350's call to quickly decarbonize both the energy and building sectors. Regardless of its source, we are deeply concerned about the negative climate and health effects from the continued use of methane as fuel.

CO2 from the combustion of methane is only half the story. Fugitive emissions from leaky gas processing and transmission infrastructure has ton-for-ton 84 times more global warming potential than CO2. Just this month the United Nations Environment Programme published its Global Methane Assessment. The assessment shows the importance of methane mitigation in limiting global warming to 1-1/2 deg. C. This quote from the report sums it up...

Lower methane concentrations would rapidly reduce the rate of warming, making methane mitigation one of the best ways of limiting warming in this and subsequent decades. Doing so would also help limit dangerous climate feedback loops, while simultaneously delivering important health and economic benefits from reducing ground-level ozone.

<https://www.ccacoalition.org/en/resources/global-methane-assessment-full-report>

In May of 2020 Rocky Mountain Institute published a report in collaboration with Physicians for Social Responsibility and others studying the health effects of indoor air pollution caused by gas stoves. They reference decades of research indicating that gas-fired appliances can elevate indoor levels of nitrous oxides, carbon monoxide, particulates and formaldehyde. These pollutants are associated with childhood asthma and other ailments with disproportionate impacts to communities of color and children from low-income households. <https://rmi.org/insight/gas-stoves-pollution-health>

It is for these reasons that I've joined a growing number of building professionals that will no longer design or construct homes with a gas connection. Architects design the future, and the future is efficiency and renewable energy. Bloomberg and Forbes report that the transition to renewables is likely to add about a million jobs and a trillion dollars in capital invested in the US over the next decade. Colorado needs to take part in the innovation and opportunities this transition offers.

Mixing a small amount of renewable gas with fracked gas will serve as a marketing tool for public utilities with little to no effect on greenhouse gas emissions. A program that promotes the construction of more gas infrastructure at ratepayer expense only delays the inevitable and urgent transition to 100% renewable energy. I respectfully urge you to please oppose senate bill 264. Thank you.

Ron Bennett, AIA
Decarbonization Advocate
350Colorado.org

SB21-264 Adopt Programs Reduce Greenhouse Gas Emissions Utilities
Tuesday, May 25, 2021
Senate Transportation & Energy
Support Testimony from Dorothy Jones, Denver Metro Chamber of Commerce

Thank you, Madame Chair and members of the committee, for the opportunity to provide this written testify. My name is Dorothy Jones and I'm the director of public affairs at the Denver Metro Chamber of Commerce. I write today on behalf of the Chamber, our 3,000 members and their 400,000 employees, to express our support for Senate Bill 264.

Greenhouse gases and, similarly, policies aimed at addressing emissions and climate change impact all Coloradans. We support efforts to reduce the emission of greenhouse gases that are achievable, backed by science and offer the flexibility necessary to avoid unintended consequences. This bill offers the flexibility utilities need to be able to successfully implement changes that will reduce the emission of these gases.

We encourage you to support Senate Bill 264. Thank you for your consideration.

SB21-264 Adopt Programs Reduce Greenhouse Gas Emissions Utilities
Tuesday, May 25, 2021
Senate Transportation & Energy
Support Testimony from Dorothy Jones, Denver Metro Chamber of Commerce

Thank you, Madame Chair and members of the committee, for the opportunity to provide this written testify. My name is Dorothy Jones and I'm the director of public affairs at the Denver Metro Chamber of Commerce. I write today on behalf of the Chamber, our 3,000 members and their 400,000 employees, to express our support for Senate Bill 264.

Greenhouse gases and, similarly, policies aimed at addressing emissions and climate change impact all Coloradans. We support efforts to reduce the emission of greenhouse gases that are achievable, backed by science and offer the flexibility necessary to avoid unintended consequences. This bill offers the flexibility utilities need to be able to successfully implement changes that will reduce the emission of these gases.

We encourage you to support Senate Bill 264. Thank you for your consideration.

Support SB21-264 Adopt Programs to Reduce Greenhouse Gas Emissions Utilities

May 25, 2021

Dear Colorado Legislature,

My name is Pat Mestas, owner of the Morning Glory Ranch in Las Animas County, along with my wife Connie and brother Rudy Mestas. We are all of Native American, Navajo and Apache, and also of Spanish descent. Our ranch has been established by family members since the 1880's. The land is sacred to us.

I have four generations of coal miners in my family, having worked in almost all of the 300+ abandoned mines including the sample mines that dot our landscape. I can tell you by personal experience about the volatility of coal bed methane having been an underground miner for years. I am 65 years old and during my childhood I saw many methane seeps throughout the area. One in particular on our ranch has been leaking methane in the creek bed for as long as I can remember. That area was approximately 100 yards long, and now has shrunk to around 30 yards long. I have always been concerned that lightning or any other ignition source could light this seepage and cause a major fire. I also know that there are seeps around the Primero School area. That bothers me thinking that it could be a hazard to our school, children, and citizens.

The air quality has improved in our community due to captured methane reducing the amount of naturally occurring seeps. As a matter of fact, the methane production in our area is one of the cleanest in the whole country. Only sulfur, the identifying smell, is added.

My family has worked in the coal mines and gas fields for decades. These sources have been the lifeline of employment and funding for our community and school district. As I drive through the area, I see many Primero graduates working in the gas fields. It is comforting to see that they didn't have to leave our community.

We are well owners and I would have never let them capture methane on my property without knowing that they would not do it in an environmentally safe way. The majority of water that is produced is probably cleaner than the bottled water that you are drinking right now. This produced water has been a source for cattle, wildlife, and also for firefighters to draw water in the hills to fight fires without having to drive miles to fill their tenders. Benefits to the area also include the establishment of riparian areas that were nonexistent before, slowing the sediment that eventually ended up in Trinidad Lake, a federal irrigation and recreational facility.

Please feel free to reach out and contact me with any questions, (719)859-4319, pat_mestas@yahoo.com.

Respectfully,

Pat Mestas



5-19-2021

Primer School District is a small, rural educational institution located in the mountains of Las Animas County, Colorado. We are home to approximately 220 students, Pre K through 12th Grade, providing Title One resources and a curriculum that develops students from Head-start to college preparation. Historically, Primero has serviced a blue-collar, working class citizenry, with strong connections to mining, timber harvesting, and earning a living from the land in general. Multiple generations of Hispanic families have attended and graduated from Primero. The blending of racial and social backgrounds has produced a plethora of benefits to the community at large, and is representative in all aspects of Primero's culture. In recent years, Primero has become a school of choice in the county and has experienced an insurgence of out-of-district students looking for a quality education provided by excellent teachers and staff.

Geographically speaking, Primero's entire district lies within the Raton Basin. According to the USGS, there are well over 300 abandoned/closed coal mines located in this region—many located a short distance from the school itself. A unique property of the coalfields located in the Raton Basin is the high occurrence of natural seeps. Like Artesian Springs, these natural seeps create free flowing processes, in this case, methane gas that escapes into the atmosphere instead of building up to dangerous subterranean levels. In fact, methane can often be seen bubbling up in stream beds throughout the basin.

Primer School supports Senate Bill 21-264—"Adopting Programs to Reduce Greenhouse Gas Emissions Utilities". This pending legislation would allow the State of Colorado to incentivize reductions in greenhouse gases, like methane. The bill creates opportunities to demonstrate the benefits of reducing or eliminating the naturally occurring methane seeps from the aforementioned coal mines and seams. Any reduction in this naturally occurring methane increases the air quality in our area, including land directly adjacent to the school.

Further incentives associated with this legislation involve the direct benefits of harnessing the escaped methane and providing this energy resource to customers without the need of refining. Raton Basin methane is exceptionally pure (99%)—producing 1000 BTU's per cubic foot. When captured, this gas is ready to use in homes and businesses. Employment opportunities in the form of new, high paying jobs are automatically created. The effect on our school and community is obvious.

Additionally, any water captured from these same seeps and seams will be put to use in ways that are critical to the quality of life in Las Animas County. Like much of Colorado, our

entire county is suffering from historic drought. The water, like the methane itself, is of very high quality. Our citizens desperately need this commodity for wildfire mitigation, wildlife enhancement, livestock utilization, recreational purposes, and many other uses.

Primero graduates will have more options when they hit the work force. Fewer families will need to look for employment in other parts of the state, or different states altogether. The economic impact to an area in constant search of stability cannot be overstated. As a strong supporter of Primero School, Evergreen Natural Resources has proven to be a valuable partner and responsible neighbor. Developments that are good for this company are invariably positive for Primero's best interests. That is certainly the case with SB21-264.

From the school's perspective, what's not to like? Cleaner air, an abundant source of high quality water and instant energy, new high paying jobs, and a reduction in explosive gas buildups, are the immediate returns. So much of the legislation coming from the state capitol in the last few years has negatively affected those living and working in Las Animas County. This bill would go a long way to reversing that trend and giving all of those in the Primero Community something to look forward to.

Sincerely,

Blake Byall—Primero School District RE-2 Principal

Oppose SB21-264 | Adopt Programs Reduce Greenhouse Gas Emissions Utilities

Dear Colorado Senate Transportation and Energy committee members. My name is Ron Bennett and I reside in Boulder. I'm an architect who's focused on decarbonizing the building sector. I'm submitting this written testimony on behalf of 350 Colorado and it's 20,000 members statewide.

350 Colorado opposes senate bill 264 as it is incompatible with 350's call to quickly decarbonize both the energy and building sectors. Regardless of its source, we are deeply concerned about the negative climate and health effects from the continued use of methane as fuel.

CO2 from the combustion of methane is only half the story. Fugitive emissions from leaky gas processing and transmission infrastructure has ton-for-ton 84 times more global warming potential than CO2. Just this month the United Nations Environment Programme published its Global Methane Assessment. The assessment shows the importance of methane mitigation in limiting global warming to 1-1/2 deg. C. This quote from the report sums it up...

Lower methane concentrations would rapidly reduce the rate of warming, making methane mitigation one of the best ways of limiting warming in this and subsequent decades. Doing so would also help limit dangerous climate feedback loops, while simultaneously delivering important health and economic benefits from reducing ground-level ozone.

<https://www.ccacoalition.org/en/resources/global-methane-assessment-full-report>

In May of 2020 Rocky Mountain Institute published a report in collaboration with Physicians for Social Responsibility and others studying the health effects of indoor air pollution caused by gas stoves. They reference decades of research indicating that gas-fired appliances can elevate indoor levels of nitrous oxides, carbon monoxide, particulates and formaldehyde. These pollutants are associated with childhood asthma and other ailments with disproportionate impacts to communities of color and children from low-income households. <https://rmi.org/insight/gas-stoves-pollution-health>

It is for these reasons that I've joined a growing number of building professionals that will no longer design or construct homes with a gas connection. Architects design the future, and the future is efficiency and renewable energy. Bloomberg and Forbes report that the transition to renewables is likely to add about a million jobs and a trillion dollars in capital invested in the US over the next decade. Colorado needs to take part in the innovation and opportunities this transition offers.

Mixing a small amount of renewable gas with fracked gas will serve as a marketing tool for public utilities with little to no effect on greenhouse gas emissions. A program that promotes the construction of more gas infrastructure at ratepayer expense only delays the inevitable and urgent transition to 100% renewable energy. I respectfully urge you to please oppose senate bill 264. Thank you.

Ron Bennett, AIA
Decarbonization Advocate
350Colorado.org