Written Testimony

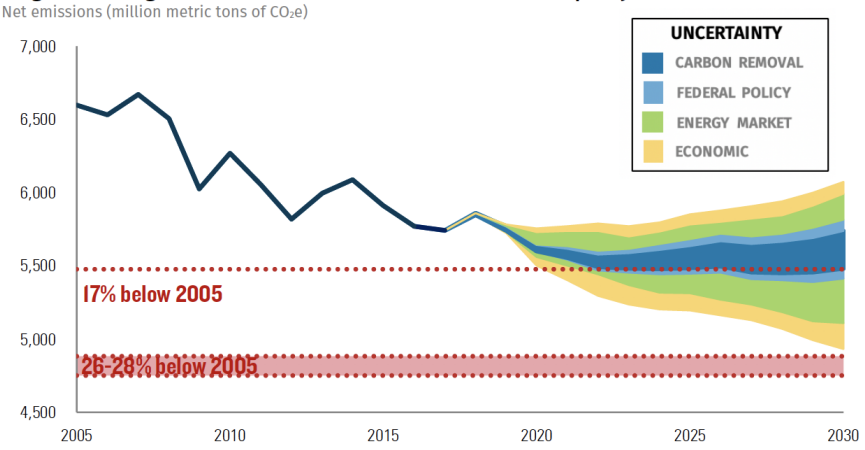
Emily Wimberger, PhD
Climate Economist, Rhodium Group
Subcommittee on the Environment and Climate Change
Building a 100 Percent Clean Economy: Solutions for Planes, Trains, and Everything Beyond Automobiles
Rayburn House Office Building Room 2322
Wednesday, October 23, 2019

Thank you Chair, Ranking Member, and distinguished members of the subcommittee. My name is Emily Wimberger, and I am a climate economist at Rhodium Group, an independent research firm whose research supports decision-makers in the public, financial services, corporate, philanthropic and non-profit sectors. Prior to joining Rhodium, I was the Chief Economist at the California Air Resources Board. On behalf of Rhodium Group, I want to thank you for convening this hearing today to examine opportunities to reduce emissions from the US transportation sector.

Taking Stock of US emissions

In our annual Taking Stock report, Rhodium provides an independent assessment of US greenhouse gas emissions and progress towards achieving the country's climate goals. In July of this year, Rhodium released Taking Stock 2019 which found that by 2025, the US is on track to reduce emissions anywhere from 12% to 19% below 2005 levels absent major policy changes – a far cry from the US Paris Agreement Pledge to reduce emissions 26% to 28%. Taking into account additional uncertainty in the direction and pace of US economic growth, we project 2025 emissions reductions as small as 11% below 2005 levels, or as great as 21% (Figure 1).

FIGURE 1
US greenhouse gas emissions under current federal and state policy
Net emissions (million metric tons of CO_2e)

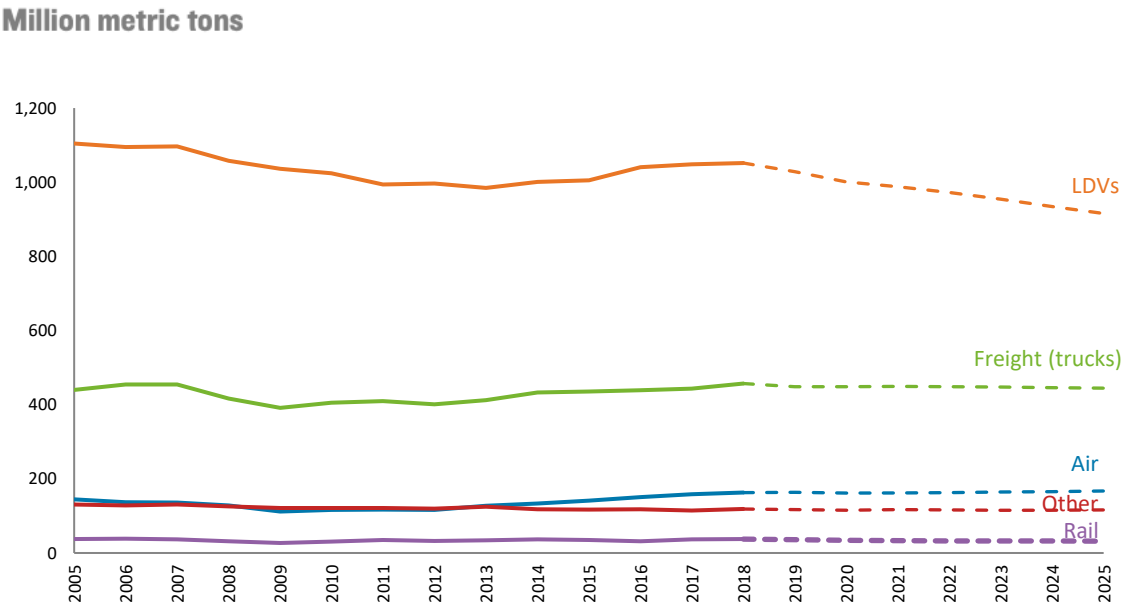


Source: Rhodium US Climate Service. Carbon Removal refers to emissions and removals from land use, land use change and forestry as well as carbon capture and sequestration.

Even more alarming, Rhodium's emissions estimates for 2018 show that greenhouse gas emissions rose last year after three years of decline. Rhodium estimates that carbon emissions from fossil fuel combustion increased by 2.7% in 2018 – the second largest annual increase since 2000. The transportation sector remained the largest source of emissions on the back of stronger economic growth and demand for diesel and jet fuel. This highlights the challenges in decarbonizing the transportation sector beyond light-duty vehicles. Efficiency improvements and electrification in non-light-duty applications are beginning to reduce emissions – but not nearly enough for deep decarbonization. In 2018, US economy wide greenhouse gas emissions likely rose by between 1.5% and 2.5%.

Looking to 2025, Rhodium's projections show that non-light-duty transportation emissions will remain mostly static baring a significant change in policy (Figure 2). Based on the state of current technology, Rhodium projects that transportation will remain the largest source of greenhouse gas emissions in the US through 2030. While these trends put the US farther from achieving long-term climate goals, they present a tremendous opportunity for policy leadership at the federal level.

Figure 2: Transport emissions by mode



Source: Rhodium US Climate Service

Comprehensive Policy Approach

Decarbonizing non-light-duty transportation presents tremendous opportunities for American innovation and global economic leadership. To meaningfully reduce emissions in the transportation sector, we must reduce our dependence on fossil fuels. Federal policies focused on electrification, low carbon fuels, and efficiency can create markets for advanced technologies that will reduce emissions and create opportunities for growth across the US economy. Transportation policies that promote markets for electric vehicles and equipment, increase the use of clean, low carbon fuels and prioritize efficiency and clean mobility can successfully decouple carbon emissions and economic growth.

Electrification

Since 2010, the cost of lithium-ion batteries has declined by 85%. That has made electric vehicles increasingly competitive in a wide range of applications. Over that period of time annual sales of electric passenger vehicles in the US has grown from under 10,000 a year to more than 360,000. However, electrification in non-light-duty applications has been slow. In the US, electric buses have only been recently introduced in very low volumes and electric trucks have yet to hit the market.

There are, however, examples of policies that drive electrification in non-light-duty applications. Globally, 99% of all electric buses are in China where national mandates have led to widespread electrification. China is also requiring the use of shore power for marine vessels built on or after 2020. In California, regulations are driving electrification of buses, marine

vessels, off-road equipment, and trucks as the state works to achieve legislatively mandated climate targets and air quality standards. California's policies have created markets for energy efficient products, low carbon fuels, and zero-emissions vehicles. The state is home to nearly half of zero-emission vehicles in the US, 40% of North American clean fuels investments, and the world's best-known electric car manufacturer.

Low Carbon Fuels

There are important opportunities for low carbon fuels to complement electrification in non-light-duty transportation. There are high barriers to electrification in some aviation and maritime applications where deployment of advanced biofuels and electrofuels created with clean power will be critical for decarbonization. Through effective federal policy design, the US can create markets for advanced low carbon fuels for applications where electrification is not feasible. Clean fuel policies can drive long-term deployment of the lowest carbon fuels as they provide certainty to businesses making capital investments in fuel development and deployment. Policies promoting low carbon fuels can also benefit sectors outside of transportation including agriculture, forestry, and waste by creating markets for feedstocks. New policies to drive innovation and investment, will reduce costs, and reduce dependence on foreign oil.

Biofuels derived from plants and waste make up just 5% of current US liquid-fuel demand and synthetic fuels made with captured carbon, hydrogen and other inputs are in the demonstration phase. Advanced biofuels have struggled to penetrate the fuel market — current levels are less than 1% of total US liquid-fuel demand. Federal policies that drive research and investment of advanced biofuels can expedite the deployment of the lowest carbon fuels especially in applications where electrification may not be feasible.

The Federal Renewable Fuel Standard and California's Low Carbon Fuel Standard have been critical in developing technologies and driving innovation in low carbon fuels. However, advanced biofuel deployment is nowhere near the scale required for deep decarbonization. Strengthening federal clean fuel standards and providing a strong price signal for the lowest carbon fuels is critical to achieving emission reductions across the transportation sector.

Efficiency

Efficiency is the third tenant of decarbonizing the transportation sector. In non-light-duty applications, efficiency means moving more people and goods with fewer emissions. Since 2004, carbon emissions from light-duty vehicles have decreased 23% and fuel economy has increased 29%. These tremendous gains have yet to be realized in other transportation applications including medium- and heavy-duty vehicles, rail, marine vessels, and off-road equipment.

Federal policies targeting engine standards, more stringent locomotive and ocean-going vessel standards, and deployment of cleaner technologies for aircrafts will result in cost savings to

consumers and American businesses. These policies also create markets for new technologies that can be exported around the world, increasing American competitiveness in the global market.

In addition, policies that increase efficient mobility and transit options can expedite near-term decarbonization while also providing health and community benefits. Technologies that increase fuel economy and reduce the weight of vehicles and equipment can also amplify carbon reductions achieved through electrification and the use of low-carbon fuels.

In closing, reducing emissions in non-light-duty transportation applications presents a tremendous opportunity to drive American innovation and create markets for advanced technologies while putting the US on a path to deep decarbonization. There are examples of comprehensive transportation policies in states, cities, and regions around the globe that have achieved deep emission reductions while promoting economic growth. Thank you again for the opportunity to testify today on such a critically important topic.