Future of Fuels and Vehicles Testimony

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Chairman Shimkus, Ranking Member Tonko, and members of the subcommittee, thank you for the opportunity to testify in front of this subcommittee today. The Union of Concerned Scientists puts rigorous, independent science to work to solve our planet's most pressing problems.

It is an exciting time to work in transportation. Experts agree that we are entering a period of change more profound than any since the automobile era began a century ago. But while autonomous vehicles are currently getting the most attention, changes in our fuels and vehicles also have important implications for our economy and environment, so thank you for holding this timely hearing, and for inviting me to share my views.

My recent report, Fueling a Clean Transportation Future, found that the fuels of the future will be cleaner and more diverse, and the transition to these fuels is already underway.

Any examination of transportation fuels must start with oil. Petroleum-based transportation fuels are the dominant source of global warming pollution in the transportation sector, which has recently surpassed the electricity sector to become the leading source of U.S. carbon dioxide emissions. There is no path to climate stability that does not involve drastically cutting our oil use.

The Union of Concerned Scientists has developed a plan to cut projected oil use in half in 20 years through improvements in efficiency and innovative clean fuels, including electricity and advanced biofuels. The largest near-term opportunity to cut oil use comes from efficiency improvements, which are not only important to the climate, but also protect consumers from oil price volatility at the pump.

Oil price volatility remains a major risk. Despite recent low oil prices, Energy Information Administration (EIA) projected that a decade from now gasoline could cost anywhere from $2.19 to $5.21 a gallon in 2017 dollars, depending on the price of oil. This price risk is mitigated by the improving fuel efficiency of our fleet. No matter what the price of gas, consumers save because of cost-effective vehicle efficiency standards. EIA forecasted that ten years from now, thanks to these standards, the average driver will use 100 gallons less to drive 10,000 miles than they do today. Using less oil is the best insurance against oil price volatility, so protecting vehicle efficiency standards is critically important.

But while oil is the largest part of the fuel mix today, this is starting to change. For 50 years, from 1958 to 2008, oil supplied at least 95% of U.S. transportation energy. Oil's hegemony began as the last coal-fired steam locomotives were replaced with diesels, and ended when refineries and gasoline distributors adopted a 10% ethanol blend as the main source of gasoline. Ethanol used as a high-octane blending component of gasoline is less expensive and less polluting than the fossil fuel alternative. But the rapid scale up of corn ethanol to supply this fuel also had negative consequences, putting pressure on agricultural commodity markets, exacerbating water pollution associated with corn farming, and land conversion as corn acreage expanded to meet the new demand.

More recently the growth of biofuels has come mostly from biodiesel, produced from soybean oil and other lower value fats and oils, such as animal fat, inedible corn oil extracted from distillers' grains, or used cooking oil. Biomethane is also a growing waste-based transportation fuel, captured at landfills, waste-water treatment plants, and diaries, it displaces fossil fuel while supporting the capture and destruction of methane, a potent climate pollutant. Cellulosic ethanol from corn-kernel fiber and corn stalks is also growing, albeit more slowly than originally hoped. The agriculture sector has a major stake in a low-carbon future that goes beyond ethanol, to other advanced biofuels and biomaterials, to bioenergy with carbon capture and storage. Landscapes that integrate existing crops with perennial

grasses and trees can increase carbon storage in soils and plants while enhancing profitability and protecting water quality and soil health.

Looking to the future, the importance of electricity as a transportation fuel is no longer a matter of dispute, although how quickly this transition occurs remains uncertain. The transition to electric vehicles (EVs) goes hand in hand with a transition to renewable power. Properly managed, EVs bring significant energy storage and demand flexibility to the power sector, providing grid services that save money not just for EV drivers, but also for other users of the grid. Today, U.S. companies are leading the way on electric vehicle technology, and, with supportive policy, the U.S. can continue to lead. Without supportive policies, the U.S. will cede the field to economic competitors, but will not stop the inevitable transition to electric vehicles.

But the transition to electrification will take time, and will proceed at different rates in different parts of the transportation sector. Petroleum and biofuels will remain important parts of our fuel mix for decades to come, so it is important to use them wisely.

Smart deployment of biofuels can support the progress of vehicle efficiency. The success of E10 demonstrates that ethanol is most valuable when used for its high-octane properties, and the Co-Optima project shows the potential to build on this success. Automakers, motivated by rising vehicle efficiency standards, are currently putting engine technologies in the market – such as turbocharging – that would benefit from the deployment of high-octane fuels. However, until cost-effective high-octane fuel is reliably available, automakers won't sell cars with the higher compression and downsized engines required to realize the benefits of the Co-Optimized system. There is no feasible deployment of optimized cars and appropriate fueling infrastructure sooner than 2026. Moreover, phasing in a new fuel gradually for use by optimized vehicles will avoid shocks to agricultural commodity markets, extend

the useful life of investments in ethanol production, and make even deeper cuts in oil use than would be possible if we remain stuck at the E10 blend wall.

Policies to support fuels and vehicles of the future should focus on cutting oil use and supporting growth and innovation in the cleanest vehicles and fuels. This work is far from done.

References

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