Study Finds Ample Supply of Clean Fuels for Washington Clean Fuels Program

The Union of Concerned Scientists has commissioned independent research to evaluate the availability of clean fuels to meet the targets of a Washington Clean Fuels Program. The analysis, Washington's Clean Fuel Future (January 2019), evaluates the quantity and carbon intensity of fuels available to meet the requirements of the proposed program, and uses this information to calculate reductions in average carbon intensity of the Washington fuel supply through 2030, on a full lifecycle basis.

The analysis finds that available clean fuels could meet a 2028 target of 11.2 percent reduction in average carbon intensity by 2028. The largest fuel pathways used to meet these standards include electricity, lower carbon sources of ethanol blended into gasoline, biodiesel and renewable diesel. Other fuels including biomethane and renewable aviation fuel also contribute to the program. While the study projects fuel availability only as far as 2030, the results by 2030 are consistent with a carbon intensity of 20 percent by 2035.
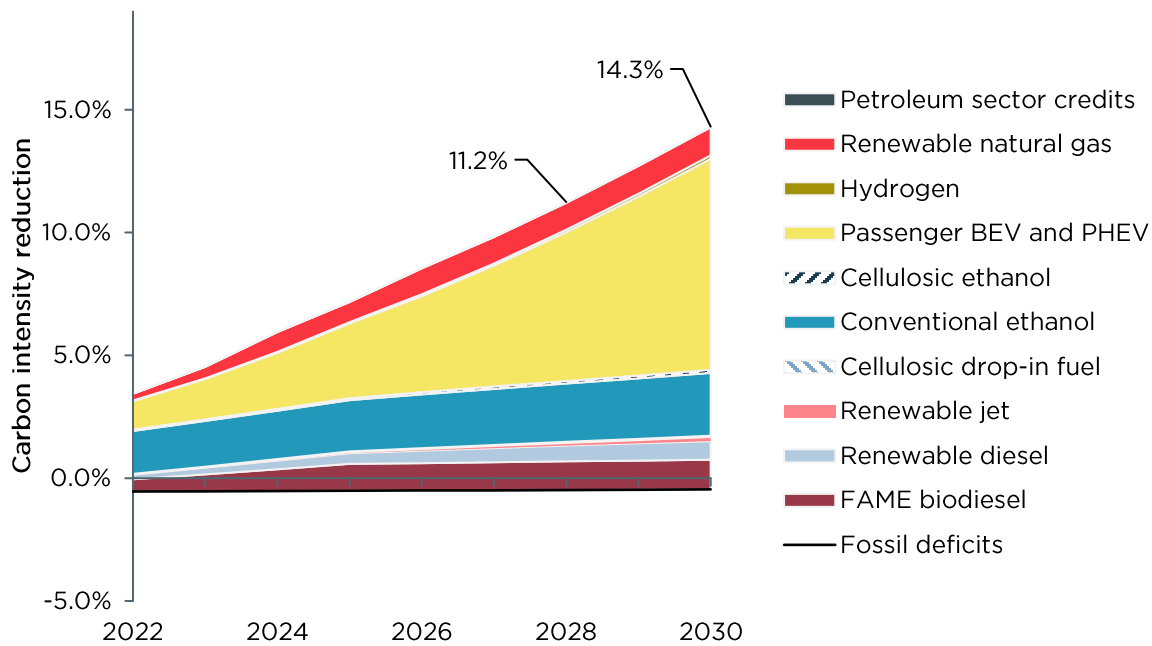

Figure 1: Steady Progress Scenario

The study also calculates the value of the Clean Fuels Program under different plausible credit prices for a variety of low carbon pathways. For example, under plausible future credit prices of $100 per metric ton of CO_2 equivalent emissions reductions (MT CO_2e), the Clean Fuels Program would produce a credit value of 52 cents per gallon for biodiesel and 84 cents per gallon for alternative jet fuel produced from woody residues.

Electric vehicle charging would also generate credits, which could be used in a variety of ways including funding a rebate program to make EVs more affordable or supporting the deployment of EV charging infrastructure. If all the credits from existing EV charging were used to support a rebate program, the available funds at $100/MT CO_2e could support a rebate that grows from $2,200 per vehicle in 2022 to $3,000 in 2028.
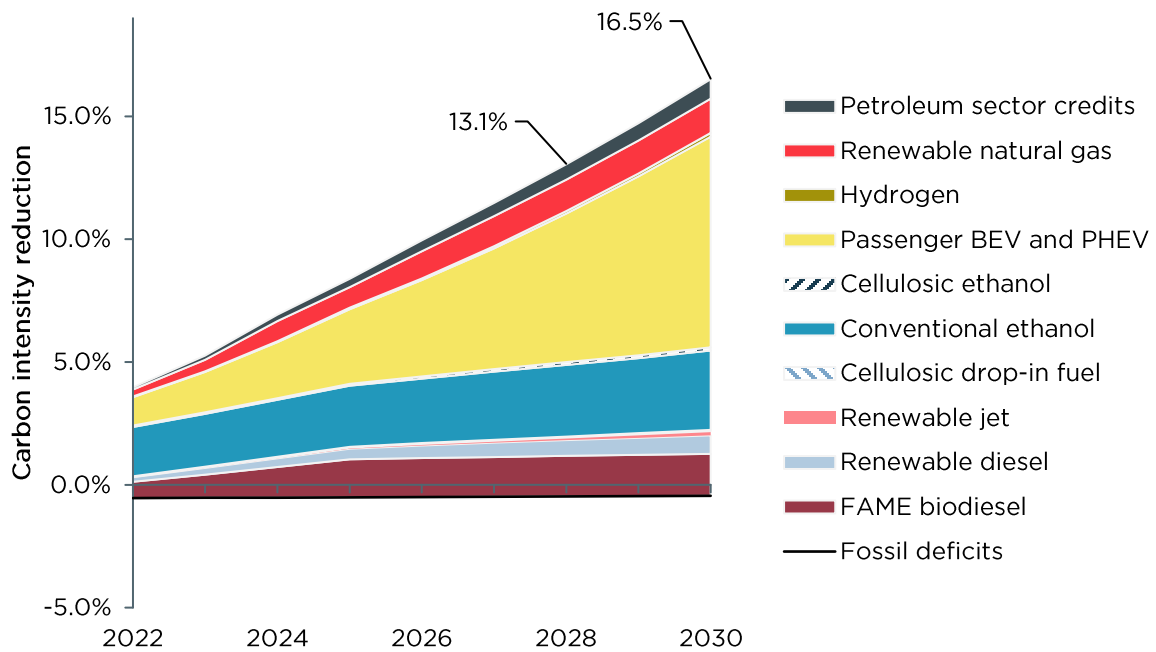
Figure 2: Accelerated Progress Scenario

In addition to the main findings, the study also evaluates a more ambitious scenario, which shows that with increased deployment and emissions reductions from biodiesel, ethanol and renewable natural gas, emissions reductions of 13.1 percent by 2028 and 16.5 percent by 2030 are achievable.

Additional scenarios considered the impact of faster or slower deployment of electric vehicles. The main scenarios assume that Washington's rate of EV deployment lags California's by 2 years, and that California meets its goals. This results in 600,00 EVs on the road in Washington by 2030. The "High EV" scenario assumes that Washington's rate of EV penetration is equal to California, exceeding 700,000 on the road in Washington by 2030, while in the "Low EV" scenario Washington trails California's rate of EV penetration by 5 years, with fewer than 400,000 EVs on the road in Washington in 2030.

The "High EV" scenario achieves carbon intensity reductions of 12.3 percent in 2028 and 15.9 percent in 2030, while the "Low EV" scenario achieves 9.0 percent in 2028 and 11.1 percent in 2030. While the 2018 carbon intensity is below the 10 percent target, banked credits from overcompliance in earlier years make it possible to meet the 10 percent target in 2028.

Modelling Methods and Scope

The analysis used an updated version of the model developed for the 2015 study Low Carbon Fuel Supply to the Pacific Coast Region of North America. The model draws upon research from a variety of sources and consultation with experts in the field to develop estimates of potential credit generation for likely fuels under a clean fuel program. The model does not explicitly evaluate credit markets or consumer costs, however most of the data used in this research comes from studies which do consider cost.

The analysis was conducted by independent research firm Cerulogy. Dr. Chris Malins, the lead author, was formerly head of the International Council on Clean Transportation's Fuels Program and is an internationally-recognized expert on alternative fuels and sustainable transportation.

Full results, methodology and assumptions are available online at www.ucsusa.org/WA-clean-fuel-2019.