

Market Reactions to Low Carbon Fuel Standard Programs

Low carbon fuel standards (LCFS) are intended to reduce emissions of greenhouse gases by lowering the average carbon intensity (CI) of transportation fuels used in a given geographical area. The original LCFS was launched in California in 2009, but similar programs have been developed or are under consideration in a number of other jurisdictions within the United States and Canada.

The Fuels Institute report, “Market Reactions to Low Carbon Fuel Standard Programs,” written by Trinity Consultants and Stillwater Associates, was commissioned to review the effect of the CA LCFS program on fuel supply and prices, evaluate evolving regulatory adjustments and compliance strategies, and provide insights about the potential market impact should similar programs be enacted in other jurisdictions. The following are some of the findings from this report.

LESSONS IN PROGRAM FLEXIBILITY AND MARKET EVOLUTION

The CA LCFS sets annual targets for reducing greenhouse gas (GHG) emissions from transportation and identifies fuels that will generate credits for offsetting GHG emissions from traditional petroleum fuels. Future required reductions increase from 7.5% below 2010 levels in 2020 to 20% by 2030.

Since its adoption in 2009, the CA LCFS program has undergone two sets of amendments, a re-adoption, several legal challenges, and is currently in the process of taking on additional changes for 2019. Each regulatory adjustment has responded to concerns of the regulated community by including additional credit generation opportunities to assist with program performance. In addition, each adjustment revised the projections for the types of fuels

regulators anticipated would be used to satisfy the requirements. This shows continued market evolution and a recognition that certain anticipated low-CI fuels or technologies did not materialize as expected. Figures 1 and 2 demonstrate the adjustments made in the program regarding anticipated use of low-CI fuels. To date, LCFS compliance has been achieved primarily through the use of starch-based ethanol, renewable diesel and biodiesel.

The amendments proposed in 2018 present scenarios based upon expectations for reduced liquid fuel consumption and rapid adoption of Zero Emission Vehicles (ZEV) extending to 2030. Figure 2 presents CARB’s forecast for credit generation under two scenarios for 2030, one of which is much more reliant on high ZEV adoption. If these market projections do not meet expectations, the program may be adjusted further.

FIGURE 1: CA LCFS CREDIT POOL PROJECTIONS FOR 2020

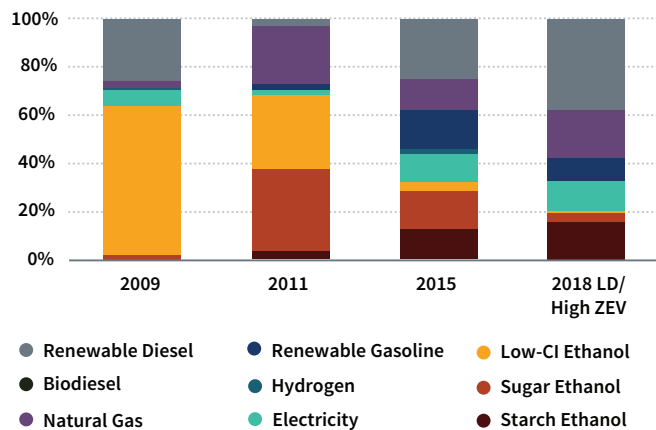
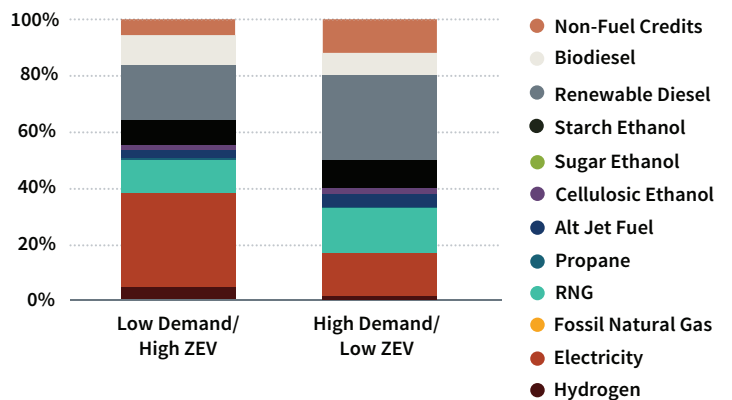


FIGURE 2: CREDIT POOL PROJECTIONS FOR 2030



PROGRAM IMPACTS ON FUEL COSTS

A critical component of the LCFS is the ability for market participants to generate, bank and sell credits. The relative cost of these credits has a direct impact on the price of fuels associated with the program. Through 2017, when compliance was relatively easy for the market due to lower GHG reduction targets, the impact on fuel prices was minor. However, as the requirements to reduce GHG emissions increases through 2030, the projected cost of credits could result in much more significant price impacts on consumers. Figure 3 shows that credit prices through 2017, which peaked at about \$101, have corresponded to an increase in gasoline and diesel prices of less than 5 cents per gallon. Figure 4 illustrates that LCFS credits could rise to more than \$300 by 2030, which could correspond to an additional 69 cents per gallon for gasoline and 39 cents for diesel.

FIGURE 3: THE COST OF THE LCFS IN CONSUMER GASOLINE PRICE THROUGH 2017

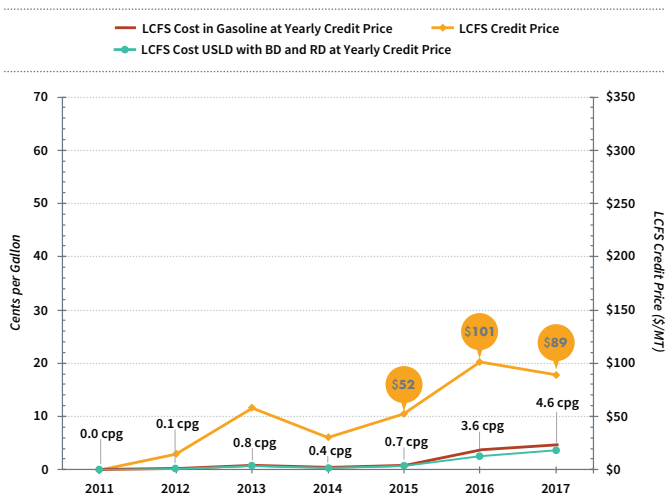
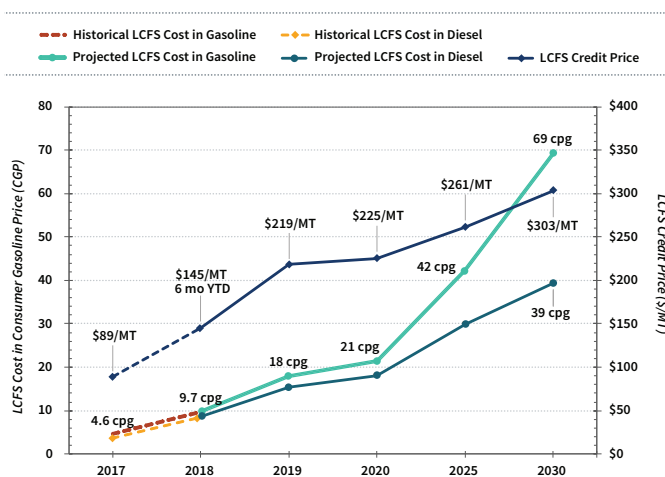


FIGURE 4: LCFS COST IN CONSUMER FUEL PRICES



IMPACT ON MARKET PARTICIPANTS

Through a series of interviews with market participants engaged in the LCFS program, Trinity and Stillwater learned that most stakeholders with whom they spoke acknowledged that the program is cost effective and that the regulation is applied consistently among regulated parties. Because most of the costs are passed through to the end user, compliance has not been overly burdensome or costly, but does impact smaller operators much more significantly.

The flexibility of the program to respond to prevailing market conditions has been a positive attribute, but it also introduces a high degree of uncertainty among market participants. It was also clear that stakeholders believe a successful credit trading program requires more market participants and greater transaction volume to provide transparent price discovery. Such an expansion, however, likely would increase competition for low-CI fuels which could exacerbate compliance challenges and increase associated program costs. Yet, the expansion to other jurisdictions could mitigate the shuffling of low-CI fuels which could enhance the ability of such programs to achieve their objectives.

FUELS INSTITUTE COMMENTARY

This report was designed to provide regulators and market participants involved with LCFS programs with insight into the successes and challenges experienced in CA. There is no intent to advocate for or against such programs or to cast judgment on the CA program. Understanding the experience of the CA LCFS program can provide regulators and market participants with valuable insight should discussions about this and other programs proceed.

About the Fuels Institute

Founded by NACS in 2013, the Fuels Institute is a nonprofit tax-exempt social welfare organization under section 501(c)(4) of the Internal Revenue Code. We are dedicated to evaluating issues affecting the vehicles and fuels markets. We commission comprehensive, fact-based research projects that are designed to answer questions, not advocate a specific outcome. Our reports address the interests of industry stakeholders—from business owners making long-term investment decisions to policymakers considering legislation and regulations that affect these markets.

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