

## 2019 Clean Fuels Forecast Review

This brief reviews the 2019 Clean Fuels forecast in light of the actual 2019 data now available. Oregon Revised Statutes (2017) Chapter 750, Section 163 authorizes the Office of Economic Analysis (OEA), in coordination with the Department of Environmental Quality, to assess the availability of fossil and alternative fuels in Oregon. In particular, the forecast is to determine whether adequate fuel supply is available to generate sufficient credits (on ethanol, electricity, and diesel substitutes - including biodiesel, renewable diesel, natural gas, and propane) to offset deficits generated during the compliance period. Given that the forecast “need not be limited to” these elements, OEA believes that it is important to project credit generation, and thus the reported volumes of all regulated fuels, through the compliance period in order to provide a complete picture of the program’s viability in achieving mandated reductions in the carbon intensity of transportation fuels. The original carbon reduction law required a ten percent reduction by 2025. A recent executive order by Governor Kate Brown increased the target to a twenty percent reduction in carbon intensities by 2030<sup>1</sup>.

Section one looks at the projected volumes of fossil and alternative fuels, while section two reviews the carbon intensities of biofuels relative to the assumptions made in the 2019 forecast. Section three examines the deficits and credits generated in comparison to the forecast. It should be noted that the latest full year of available data for the Clean Fuels program at the time of the publication of the 2019 forecast was 2017.

### Section One: Reported Volumes

**Table 1: 2019 Clean Fuels Forecast – Reported Volumes**

(Mil. gallons, percent)	2017*	2018	2019	%ch from 2017	2019 Forecast**	Actual Less Forecast
Conventional Gasoline	1,440.6	1,535.8	1,562.0	8.4%	1,436.1	125.9
Ethanol	173.9	172.2	173.7	-0.1%	164.9	8.7
<i>Ethanol Blend Rate</i>	<i>10.8%</i>	<i>10.1%</i>	<i>10.0%</i>		<i>10.3%</i>	
Blendstock	1,614.5	1,708.0	1,735.7	7.5%	1,601.0	134.6
Fossil Diesel	682.6	716.4	712.3	4.3%	673.4	38.9
Biodiesel	51.2	51.6	60.1	17.4%	64.9	-4.8
<i>Biodiesel Blend Rate</i>	<i>7.0%</i>	<i>6.7%</i>	<i>7.6%</i>		<i>8.5%</i>	
Renewable Diesel	0.3	1.2	16.8	4827.6%	30.0	-13.2
<i>Renew diesel Blend Rate</i>	<i>0.0%</i>	<i>0.2%</i>	<i>2.1%</i>		<i>3.9%</i>	
Total Diesel	734.1	769.3	789.1	7.5%	768.3	20.8
Electricity (on-road)	1.6	2.2	2.9	75.1%	2.5	0.4
Electricity (off-road)	0.0	1.7	2.2		N/A	
Fossil Natural Gas	0.9	1.5	1.4	52.4%	2.7	-1.3
Biogas	1.9	1.7	2.2	19.4%	6.3	-4.1
<i>Biogas Blend Rate</i>	<i>67.1%</i>	<i>54.1%</i>	<i>61.5%</i>		<i>70.0%</i>	
Total Natural Gas	2.8	3.2	3.6	30.3%	9.0	-5.4
Propane	0.1	0.7	2.1	1502.3%	1.1	1.0
* Final values subject to revision following the publication of the 2019 Forecast.						
**Forecast values equal midpoint of the forecast range						

<sup>1</sup> [https://www.oregon.gov/gov/Documents/executive\\_orders/eo\\_20-04.pdf](https://www.oregon.gov/gov/Documents/executive_orders/eo_20-04.pdf)

Table one presents the reported volumes of fossil and alternative fuels for the years 2017-19, as well as the 2019 projections published by the Office of Economic Analysis. It should be noted that the Covid-19 pandemic did not begin to affect transportation patterns until early 2020, and thus the 2019 actual report volumes do not reflect any impact from this event.

Total gasoline (including ethanol) reported to the program increased 7.5 percent between 2017 and 2019. By comparison, gasoline was expected to fall approximately 1.5 percent in the 2019 forecast. This resulted in a forecast deviation of 134.6 million gallons. The forecast for ethanol was based on a 10.3 percent blend rate assumption. The actual blend rate was 10 percent. Actual reported ethanol exceeded the forecast by 8.7 million gallons.

Coincidentally, total diesel (including biodiesel and renewable diesel) reported also grew 7.5 percent over the two-year forecast horizon. Diesel was projected to increase approximately 2.5 percent in the 2019 forecast, resulting in a forecast deviation of 20.8 million gallons. The forecast for biodiesel was based on an average blend rate assumption of 8.5 percent. The actual blend rate was 7.6 percent, producing a deviation from the forecast of -4.8 million gallons. Renewable diesel was projected using an average blend rate assumption of 3.9 percent, while the actual blend rate came in at 2.1 percent. The actual amount of renewable diesel reported fell below forecast by 13.2 million gallons.

In gasoline gallon equivalents, electricity consumed in electric vehicles was expected to total 2.5 million gallons. Electricity consumption actually grew 75.1 percent over the two-year forecast horizon and equaled 2.9 million gallons. Electricity reported for off-road use was not forecast directly, but rather the credits associated are illustrated in section three.

Total natural gas used for transportation was expected to total 9.0 million gallons. The actual amount of natural gas reported was 3.6 million gallons, a forecast deviation of -5.4 million gallons. Renewable natural gas, or biogas, was projected using an average blend rate assumption of 70 percent. The actual blend rate was 61.5 percent.

Finally, reported liquefied petroleum gas, or propane, was predicted to equal 1.1 million gallons for 2019. The actual amount report was 2.1 million gallons, a fifteen-fold increase over the two-year forecast horizon.

## Section Two: Carbon Intensities for Biofuels

The amount of credits that would be generated by the projected volumes of the three biofuels (ethanol, biodiesel and renewable diesel) depend on the expected carbon intensities that were assumed in the forecast. Table 2 compares the forecast assumptions with the actual carbon intensities that were realized in the reported data.

	Actual (weighted avg.)	2019 Forecast Assumption
Ethanol	58.13	59.02
Biodiesel	38.63	47.09
Renewable Diesel	30.33	45.75

In the case of all three biofuels, the actual weighted average carbon intensities exhibited in the reported data were lower than the forecast assumptions.

### Section Three: Deficits and Credits

Table 3 presents the deficits and credits generated by the reported fossil and alternative fuels, as well as the projections published in the 2019 forecast.

		2019	2019 Forecast*	Actual Less Forecast
Deficits	Gasoline	-664,575	-634,994	-29,581
	Diesel	-333,290	-319,672	-13,618
<b>Deficit Total</b>		<b>-997,865</b>	<b>-954,666</b>	<b>-43,199</b>
Credits	Ethanol	520,915	525,587	-4,672
	Biodiesel	441,009	417,850	23,158
	Renewable Diesel	145,349	228,029	-82,679
	Electricity, on-road	79,856	63,391	16,465
	Electricity, off-road	21,303	20,300	1,003
	Natural Gas	10,686	63,103	-52,417
	Propane	6,182	1,754	4,428
<b>Credit Total</b>		<b>1,225,300</b>	<b>1,320,014</b>	<b>-94,713</b>
<b>Net Credits/Deficits</b>		<b>227,435</b>	<b>365,348</b>	<b>-137,912</b>
* Forecast values equal midpoint of the forecast range				

As noted in section one, the forecast for fossil fuels fell short of actual volumes. As such, actual deficits generated by gasoline and diesel fuel exceeded the 2019 forecast. For alternative fuels, there were a mix of over- and under-forecast values. However, renewable diesel and natural gas fell significantly short of the expected number of credits, bringing the total actual number of credits well short of forecast. The actual net credits generated equaled 227,435 compared to the forecast of 365,348.

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