

## **DECLARING INDEPENDENCE FROM IMPORTED PETROLEUM: ETHANOL SAVES AMERICAN DRIVERS BILLIONS IN GASOLINE EXPENSES**

The national average retail price for regular grade gasoline was \$2.83/gallon heading into the July Fourth holiday, the highest in five years.<sup>1</sup> While gas prices continue to rise, ethanol is serving as a stabilizing force that is helping to keep pump prices in check.

In fact, an analysis of wholesale gasoline and ethanol price data show that blending 10% ethanol (E10) in recent months has reduced wholesale gas prices by at least \$0.26/gallon, or 12%. **At current prices, this means E10 could help U.S. consumers save at least \$37 billion per year on gasoline expenses, or \$292 per household.** This estimate is conservative, as it excludes the additional aggregate cost savings that result from ethanol's extension of the U.S. fuel supply and displacement of crude oil demand.

If 15% ethanol blends (E15) were used in place of E10 in all approved motor vehicles, the savings would be at least \$0.32/gallon, or 15%.<sup>2</sup> **Thus, households using E15 could save \$364 per year, or roughly \$43 billion nationwide.**<sup>3</sup>

However, arcane regulatory barriers are keeping E15 out of the marketplace in much of the country, meaning consumers are unnecessarily spending an extra \$0.06 per gallon on gasoline.

### **ANALYSIS**

The Nebraska Energy Office maintains monthly wholesale price data for gasoline blendstock and ethanol sold at the Omaha rack.<sup>4</sup> The data set is unique in that it includes price history for "sub-octane" gasoline blendstock (84 AKI) tailored for E10 blending, as well regular grade E0 gasoline (87-AKI). In order to reach the minimum octane rating required for sale at retail (87 AKI), the 84-AKI blendstock must be blended with 10% ethanol. Meanwhile, the 87-AKI E0 can be sold at retail without blending any ethanol (although 87 AKI gasoline is often blended with 10% ethanol to make 91-AKI "premium" gasoline).

Since the beginning of the year, gasoline blendstock designed for E10 blending (84-AKI) has been \$0.13/gallon cheaper than E0 gasoline (87-AKI) on average at the Omaha rack. This is not surprising, as increasing the octane level of gasoline at the refinery using hydrocarbon octane sources is costly and energy intensive. The wholesale savings resulting from 84-AKI blendstock (compared to 87-AKI gasoline) is attributable to ethanol because it would not be possible for refiners to produce and sell sub-octane blendstock if not for the fact that ethanol can be used at the rack to increase the octane rating to required levels.

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<sup>1</sup> Energy Information Administration. [https://www.eia.gov/dnav/pet/pet\\_pri\\_and\\_a\\_epmr\\_pte\\_dpgal\\_w.htm](https://www.eia.gov/dnav/pet/pet_pri_and_a_epmr_pte_dpgal_w.htm)

<sup>2</sup> E15 is legally approved for model year 2001 and newer automobiles, which represent more than 90% of the existing auto fleet and roughly 93% of vehicle miles traveled. E15 is not approved for use in off-road equipment and small engines.

<sup>3</sup> Assumes 93% of gasoline consumed nationwide is E15, while remaining 7% is E10 and E0 for small and off-road engines and older (pre-2000) motor vehicles.

<sup>4</sup> Nebraska Energy Office. <http://www.neo.ne.gov/statshtml/66.html>

In addition, ethanol has been priced far below both 87-AKI and 84-AKI gasoline blendstock at the Omaha rack. Since the beginning of the year, ethanol prices have averaged just \$1.20/gallon, or \$0.93/gallon below 87-AKI and \$0.80/gallon below 84-AKI. In other words, average ethanol prices have been equivalent to just roughly *half* (56%) of average 87-AKI gasoline prices.

So far this year, a blender at the Omaha rack could combine 90% gasoline (84-AKI) with 10% ethanol to make E10 for an average price of \$1.92/gallon. The blender would also obtain RIN credits for blending ethanol, which he may then sell to obligated parties under the RFS for a profit.<sup>5</sup> Through the first five months of the year, RIN prices have averaged \$0.49/gallon of ethanol. Thus, the RIN value associated with E10 would be \$0.049/gallon (10% x \$0.49). As such, the blender's net cost to make E10 is lowered another \$0.05/gallon to \$1.87/gallon since he profits from the sale of the RIN. Blenders often pass through most or all of this RIN value in the form of a further discount on ethanol-blended fuel. This results in the E10 wholesale price being \$0.26/gallon—or 12%—lower than the price of E0 gasoline (87-AKI) over the first five months of the year.

E15 provides even larger savings. A blender at the Omaha rack could mix 85% gasoline (84-AKI) with 15% ethanol to make E15 for an average price of \$1.88/gallon (incidentally, the finished E15 would have an octane rating of 88 AKI, offering an extra point of octane over regular 87-AKI E10). The RIN value associated with E15 would be \$0.07/gallon, meaning the blender's net cost to make E15 is \$1.81/gallon, a whopping \$0.32/gallon—or 15%—less than E0 gasoline.

The U.S. consumes approximately 143 billion gallons of gasoline annually. Thus, if the Omaha rack prices are representative of nationwide average ethanol and gasoline prices, then E10 represents aggregate savings of \$36.8 billion over E0, while E15 would represent aggregate savings of \$42.8 billion.<sup>6</sup> This amounts to household savings of \$292 and \$364 for E10 and E15, respectively.

## DATA

### Omaha Rack (Wholesale) Prices and Cost to Blend E10 and E15

	A	B	C	D	E	F
	87-AKI Gas	84-AKI Gas	Ethanol	RIN	E10 (87 AKI) Cost <small>(B*0.9)+(C*0.1)-(D*0.1)</small>	E15 (88 AKI) Cost <small>(B*0.85)+(C*0.15)-(D*0.15)</small>
JAN-18	\$2.08	\$1.95	\$1.00	\$0.66	\$1.79	\$1.71
FEB-18	\$2.05	\$1.92	\$1.11	\$0.65	\$1.77	\$1.70
MAR-18	\$2.06	\$1.93	\$1.25	\$0.46	\$1.82	\$1.76
APR-18	\$2.16	\$2.03	\$1.31	\$0.37	\$1.92	\$1.87
MAY-18	\$2.31	\$2.19	\$1.34	\$0.31	\$2.07	\$2.02
<b>AVG</b>	<b>\$2.13</b>	<b>\$2.00</b>	<b>\$1.20</b>	<b>\$0.49</b>	<b>\$1.87</b>	<b>\$1.81</b>

All values are in \$/gallon.

Sources: Nebraska Energy Office and OPIS (RINs)

<sup>5</sup> RINs (Renewable Identification Numbers) are tradeable credits used to demonstrate compliance with Renewable Fuel Standard blending obligations. RIN price data was sourced from the Oil Price Information Service (OPIS).

<sup>6</sup> Conservatively assumes the wholesale-to-retail markup is the same for all grades of gasoline (E0, E10, E15), despite evidence that the mark-up for E0 is larger than the mark-up for E10 and E15. Assumes E15 replaces maximum of 93% of E10 gasoline; remaining 7% is E10 or E0 for small engines and older automobiles.