

Household Transportation Fuel Bills and the Climate Security Act

Including Savings for 2020 and 2030

Household transportation fuel bills in 2020 and 2030 could be 16 and 18 percent lower than today's bills even if oil companies purchase emission allowances under the Climate Security Act (CSA). Total transportation fuel bills are what matters to household budgets, not the price per gallon of gasoline.

Summary Results for 2020 and 2030: up to \$530 to \$590 Fuel Cost Savings per Household

Table S1. Household Fuel Expenditures in 2020 and 2030 with the Climate Security Act

	2007	2020	2030
Transportation fuel expenditures, 2006 \$/household ^a	\$ 3,220	\$ 2,690	\$ 2,630
Change in expenditures from 2007	n/a	-16%	-18%
Savings, 2006 \$/household	n/a	\$530	\$590

a. 2007 value based on US DOE Energy Information Administration *Annual Energy Outlook 2008* base case (see <http://www.eia.doe.gov/oiaf/aeo/>). 2020 value based on US DOE Energy Information Administration analysis of S. 2191 (see <http://www.eia.doe.gov/oiaf/service/s2191/index.html>). 2030 value based on NRDC analysis with computer stock model LEAP that achieves CAFE standards of 35 mpg by 2020 (as per EISA 2007) and then extends fuel economy improvements to 45 mpg by 2030; carbon intensity of the transportation fuel pool is estimated to decrease by 10% in 2028 (per the low carbon fuel standard of the CSA); in 2030, the light-duty sector uses 47 billion gallons of ethanol and 12% of VMT is powered by grid electricity.

Detailed Results for 2020: \$230 to \$530 Savings per Household

Under the Climate Security Act, we estimate that the average household will pay 7% to 16% less for transportation fuels in 2020 than they did in 2007, depending on the future price of oil. As a result, the average household's total transportation fuel bill will be \$230 to \$530 lower in 2020 than it was in 2007. Total fuel costs drop due to more fuel efficient vehicles and (in the higher savings case) the decrease in oil prices forecast by the U.S. Energy Information Administration (EIA). For a sensitivity case, we estimated the savings if oil prices did not drop from 2007 average levels although the current AEO2008 predicts a drop. As shown in Table 1, the average household still pays about 7% less in total transportation fuel bills in 2020, or a decrease of \$230.

Table 1. Household Fuel Expenditures in 2020 with the Climate Security Act (based on EIA S. 2191 Core Case)

	2007	Fuel Prices with Carbon Addition	Constant 2007 Gasoline Price
Gasoline price, 2006 \$/gallon	\$2.77	\$2.58 ^b	\$ 2.99 ^c
Transportation fuel expenditures, 2006 \$/household ^a	\$ 3,220	\$ 2,690	\$ 2,990
Change in expenditures from 2007	n/a	-16%	-7%
Savings, 2006 \$/household	n/a	\$530	\$230

a. NRDC estimate based on US DOE Energy Information Administration analysis of S. 2191 (see <http://www.eia.doe.gov/oiaf/service/s2191/index.html>).

b. US DOE Energy Information Administration analysis of S. 2191 (see <http://www.eia.doe.gov/oiaf/service/s2191/index.html>).

c. Assumes base gasoline price of \$2.77 plus the difference in gasoline costs between the AEO2008 base case and the S. 2191 Core case (see <http://www.eia.doe.gov/oiaf/service/s2191/index.html>).

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Detailed Results for 2030: \$590 to \$805 Savings per Household

For 2030, we use EIA's world oil price forecasts and estimate that the average household will pay 18% to 25% less for transportation fuels under the CSA than they did in 2007, depending on the price of emission allowances. As a result, the average household's total transportation fuel bill will be \$590 to \$805 lower in 2030 than it was in 2007.

Table 2. Household Fuel Expenditures in 2030 with the Climate Security Act

	2007	Low Allowance Price	High Allowance Price
Carbon allowance price, \$/tonne of CO ₂ -equivalent	n/a	\$ 19 ^b	\$ 61 ^c
Transportation fuel expenditures, 2006 \$/household ^a	\$ 3,220	\$ 2,415	\$ 2,630
Change in expenditures from 2007	n/a	-25%	-18%
Savings, 2006 \$/household	n/a	\$805	\$590

a. 2007 value based on US DOE Energy Information Administration *Annual Energy Outlook 2008* base case (see <http://www.eia.doe.gov/oiaf/aeo/>). 2030 values are NRDC estimates based on computer stock model LEAP that achieves CAFE standards of 35 mpg by 2020 and then extends fuel economy improvements to 45 mpg by 2030. Also included is an assumption that carbon intensity of the transportation fuel pool is reduced by 10% in 2028 (per the low carbon fuel standard of the CSA); in 2030, the light-duty sector uses 47 billion gallons of ethanol and 12% of VMT is powered by grid electricity.

b. Carbon allowance price from International Resources Group model run of S. 2191 using the MARKAL model for NRDC (see <http://www.nrdc.org/media/2008/080513.asp>). Base fuels price (without carbon allowance price addition) from US DOE Annual Energy Outlook 2008 base case (see <http://www.eia.doe.gov/oiaf/aeo/>).

c. Based on US DOE Energy Information Administration analysis of S. 2191 (see <http://www.eia.doe.gov/oiaf/service/rpt/s2191/index.html>).

Total fuel costs are even lower than in 2020 due to higher fuel efficiency of the fleet and greater use of electricity for transportation fuel. Base gasoline prices are also lower than in 2007, but slightly higher than in 2020, according to the prices forecast by DOE. Since EISA 2007 requires NHSTA to set CAFE standards at maximum feasible levels from 2021 to 2030, we assume the standards beyond 2020 increase at a similar rate as the 2011 to 2020 period and reaches 45 mpg by 2030.

We also estimate that household transportation energy will significantly shift from petroleum to lower carbon alternatives, such ethanol and electricity, driven by CSA's Low-Carbon Fuel Standard (LCFS). The LCFS requires a 10 percent reduction in transportation fuel pool carbon intensity by 2028. Because of the greater efficiency of electric drive-trains compared to internal combustion engines, the switch to electricity lowers total energy consumption per vehicle. The switch to ethanol, on the other hand, is not assumed to reduce fuel costs since the price on an energy equivalent basis is predicted to be slightly higher than gasoline in EIA's AEO2008 forecast.

Lower Fuel Bills Likely Even if Base Gasoline Prices Do Not Decline

Even if base gasoline prices do not fall from 2007 levels (which AEO2008 forecasts), households will still see their fuel bills drop significantly. If base gasoline prices do not drop from 2007 levels, the reduction in gasoline consumption due to a more energy efficient vehicle fleet and greater use of electricity is more than sufficient to outweigh the increase in fuel costs due to addition of the carbon allowance on the base price.

To demonstrate this, we ran a sensitivity analysis of household bills assuming that the base gasoline price without the carbon allowance price addition stays at the 2007 average level of \$2.77 per gallon. As shown in Table 3, the average household still pays about 12% to 19% less in total fuel bills in 2030, or a decrease of \$390 to \$600.

Table 3. Sensitivity Case: Household Fuel Expenditures in 2030 Assuming Constant 2007 Base Fuel Price and Varying Carbon Allowance Prices

	2007	Low Allowance Price	High Allowance Price
Gasoline price, 2006 \$/gallon	\$2.77	\$2.94 ^b	\$ 3.18 ^c
Transportation fuel expenditures, 2006 \$/household ^a	\$ 3,220	\$ 2,620	\$ 2,830
Change in expenditures from 2007	n/a	-19%	-12%
Savings, 2006 \$/household	n/a	\$600	\$390

a. 2007 value based on US DOE Energy Information Administration *Annual Energy Outlook 2008* base case (see <http://www.eia.doe.gov/oiaf/aeo/>). 2030 values are NRDC estimates based on computer stock model LEAP that achieves CAFE standards of 35 mpg by 2020 and then extends the CAFE increase to 45 mpg by 2030. Also included is an assumption that carbon intensity of the transportation fuel pool is reduced by 10% in 2028 (per the low carbon fuel standard of the CSA); in 2030, the light-duty sector uses 47 billion gallons of ethanol and 12% of VMT is powered by grid electricity.

b. Assumes base gasoline price of \$2.77 plus carbon allowance price of \$19/tonne determined from International Resources Group model run of S. 2191 using the MARKAL model for NRDC (see <http://www.nrdc.org/media/2008/080513.asp>).

c. Assumes base gasoline price of \$2.77 plus the difference in gasoline costs between the AEO2008 base case and the S. 2191 Core case (see <http://www.eia.doe.gov/oiaf/service/rpt/s2191/index.html>).

