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The Economics of Purchasing a More Fuel-Efficient Vehicle

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Gas prices continue to creep up, and many people are experiencing significant pain at the pump. A typical response to higher fuel prices is to consider trading your current vehicle for one that is more fuel efficient or even one that uses an alternative fuel. If you simply compare the cost of filling the tank, this decision seems to be a good one.

Comparing Fuel Costs

The U.S. Department of Energy's website www.fueleconomy.com tracks miles per gallon (MPG) and fuel estimates of vehicles from 1985 to the present. From this site, it can be determined that a 2005 4-wheel drive (4WD), six-cylinder SUV has an estimated 15 MPG and annual fuel costs of $3,500 (assuming 15,000 annual miles driven with gas at $3.50/gal). By comparison, a 2011 hybrid car has an estimated 33 MPG and annual fuel costs of $1,591 (again, at 15,000 miles and gas at $3.50/gal). Trading your older model SUV for a smaller hybrid car would result in annual fuel savings of $1,909.

Adding the Additional Costs

Before you rush to your nearest car dealer, you need to consider a few more numbers, including the following:

- price of the new vehicle
- depreciation
- estimated trade-in value of your current vehicle
- current loan principal
- financing costs
- down payment

Using the same two vehicles for comparison, a 2005 4WD SUV and a 2011 hybrid car, let's walk through the following example.

Assume your SUV has a trade-in value of $7,375 and has been paid in full. Your monthly car expense (excluding taxes, insurance, and maintenance) is fuel costs—in this scenario, about $291/month, assuming $3.50/gal for gas, 15 MPG, and driving approximately 1,250 miles/month. The new-car cost of the 2011 Hybrid is $27,435. With a 10% down payment ($2,700) and your trade-in,

fuel efficient

expenditures

your new loan amount is $17,360. Although vehicle financing rates will vary, assuming the terms of 5.7% for 36 months, your monthly principal and interest payment for the new car would be about $525. Add on your monthly gasoline expenses of $132, and your new monthly car expenditures would be $657. Based on your monthly gasoline savings, it would take you over 11 years to recoup the extra cost of the new car (Table 1).

Granted, this is just one scenario, so the outcome could change if it were to vary. For example, if you paid cash for the new hybrid to avoid financing, the time period it would take to recoup your investment in the new vehicle based on fuel savings would be reduced from 135 months to 126 months. Now consider the possibility of even higher gasoline prices. If you anticipate paying $5/gal for gas instead of $3.50/gal, you would recoup what you paid for the hybrid in about 8 years, not 11.

You may be surprised to learn that trading in your older model, a less fuel-efficient vehicle, may not make financial sense based on fuel economy alone. So, is it sometimes wise to consider purchasing the new, more fuel-efficient vehicle? The answer is most likely yes; however, every situation is different. Many other factors related to your current vehicle should also influence your decision, such as its dependability, anticipated major repairs, and maintenance costs. Also, check with your insurance agent regarding rate changes if you were to purchase a new or newer vehicle.

You can use the following worksheet to calculate your potential costs/savings with the purchase of a more fuel-efficient vehicle. You may find it helpful to use a calculator.

Table 1. Comparing additional costs.

	2005 4WD SUV	2011 Hybrid Car
New Car Cost*		$27,435
Current Trade-In Value*	$7,375	N/A
Down Payment	N/A	$2,700
Financing costs (APR%)	0%	5.71%
Term of Loan	0	36 months
Miles per Gallon	15	33
Current Gasoline Price	$3.50	$3.50
Est. Yearly Gas Expense (driving 15,000 miles)	$3,500	$1,590
Total Monthly Car Expense (Loan & Gasoline)	$291	$657
Time to recoup cost of new car		11+ years (135 months)

* Vehicle trade-in value and new car pricing based on Kelly Blue Book pricing at time of this publication.

Sources

U.S. Department of Energy. http://www.fueleconomy.gov/feg/sbs.htm

Kelly Blue Book. http://www.kbb.com/

Determining the Cost of Purchasing a More Fuel-Efficient Vehicle

Step 1.	
A. Trade-in value of current vehicle	$
B. Minus Remaining loan principal, current vehicle	$
C. (**A** - **B**)	$
D. Plus down payment amount	$
E. Equals amount applied to new car **(C** + **D)**	$

Step 2.	
A. New car cost	$
B. Minus amount applied to new car (**Step 1, E)**	$
C. Total loan amount	$

Step 3.	
A. Financing costs (APR %)	%
B. Term of loan (months)	
C. Monthly car payment *(principal and interest*)* **(Step 2, C + % ÷ number of months)**	$

Step 4.	
A. Estimated number of miles/month	
B. Miles/gallon, current vehicle	
C. Gallons of gas/month (**A** ÷ **B**)	
D. Price/gallon of gas	$
E. Total monthly gas expense **(C** x **D**)	$

Step 5.	
A. Estimated miles/month, new vehicle	
B. Miles/gallon, new vehicle	
C. Gallons of gas/month (**A** ÷ **B**)	
D. Price/gallon of gas	$
E. Total expected monthly gasoline expenditures with new vehicle (**C** x **D**)	$

Step 6.	
A. Total current monthly gas expense (**Step 4, E**)	$
B. Total expected monthly gas expense, new vehicle (**Step 5, E**)	$
C. Monthly gas savings (**A** – **B**)	$

Step 7.	
A. Monthly car payment (**Step 3, C**)	$
B. Number of months of loan (**Step 3, B**)	
C. Total loan (**A** x **B**)	$
D. Plus down payment amount (**Step 1, D**)	$
E. Total cost of new vehicle (does not include value of trade-in) **(C + D)**	$
F. Less remaining loan principal, current vehicle (**Step 1, B**)**	$
G. Total additional cost of new vehicle	$

Step 8.	
A. Total additional cost new vehicle (**Step 7, G**)	$
B. Monthly gas savings (**Step 6, C**)	$
C. Number of months to break even (**A** ÷ **B**)	
D. Number of years to break even (**C** ÷ **12**)	

* Several online calculators are available to help you calculate your monthly car payment once you have identified the above-mentioned terms. The car dealership or your lender can also help you determine your monthly car payment.

** If you have a loan on your current vehicle, you should consider it in the comparison. If your current vehicle is paid in full, this line would be zero.

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