



(CNG) at UNH: FY 2015 Update

Fueling Station, Maintenance Garage Upgrade and Fleet Status

Funding provided by USDOT (CMAQ), FTA, USDOE, NHDES and ARRA
Combined investments of over \$4.5M (\$3M fleet) (approx. 85% net federal)
15 year UNH fuel savings: \$384,000 fuel /1,500 tons CO2 emissions

CNG growth continued in FY 2015 with expansion of the Wildcat CNG fleet and incremental improvements in fueling storage/capacity. The project has been supported by numerous state and federal partners.



Fall 2014 Newest Wildcat Transit CNG



Phase II CNG Fuel Station – fall 2010



Phase III High Pressure Dispenser – fall 2011

CNG at UNH: A growing component of our Eco-Cat™ program commitment:

- UNH has operated CNG fleet vehicles since 2000. As of November 2015, it operates 33 CNG vehicles including transit buses, bi-fuel pickup trucks and passenger cars. In FY 2015, CNG vehicles logged over 260,000 miles and used over 56,000 gas gallon equivalents of CNG (replacing primarily diesel/B20).
The use of CNG in the UNH fleet over the past 15 years has reduced an estimated 1,500 tons¹ of CO2 emissions and 275,000 gallons of gas/diesel fuel with estimated net fleet fuel savings of over \$384,000
The estimated fuel cost savings for this CNG fleet to UNH was approximately \$34,000 in FY 15².
Transit is our largest CNG user - 96% of total UNH CNG gge.

Table with 4 columns: Fiscal Year, CNG (gge)³, % Total fleet fuel share⁴, % Transit fleet fuel share⁵. Rows include years 2007, 2009, 2011, 2013, 2014, 2015, and 2016 project.

¹ Based on gas-diesel-B20 average of 25 lbs,CO2/gallon burned and CNG of 14.6 lbs.
² 2015 ave pump price of CNG was \$2.29/gge and diesel/gas was \$2.89 @ state price. Excludes CNG station op costs and IRS rebate
³ Based on Unitol fuel station meter invoices, or subsequent pump dispense reports from UNH
⁴ Use NHDOT provided UNH-Durham only liquid fuel data share as of FY 2015 invoice-based CNG data (FY 16 = projected)
⁵ Estimate of CNG gge versus NHDOT UTS Transit only - liquid fuel consumption (gasoline, diesel and B20) (FY 16 = projected)



US grown low emission biodiesel

Biodiesel at UNH: FY 2015 Update
Fueling Station and Fleet Status

In cooperation with NHDOT fueling
8 year UNH fuel savings: \$0
estimated 2,000 tons CO2 emissions



In August 2006, in coordination with NHDOT, the first state owned fuel station to offer B20 opened in Durham and UNH began transition of its diesel fleet to year-round B20 operation. In FY 2007, most diesel transit vehicles switched to B20 and UNH took possession of its first dedicated B20 fueled, California Air Resource Board Certified (CARB) low emission buses. In succeeding years, UNH Transit embarked on balanced fleet procurement - half B20 and half CNG. UNH continues a transition of all post-1990 diesel vehicles to B20. As of July 2015, UNH utilized B20 for approximately 63% of diesel engine requirements - down for a second year from an FY13 high of 85%. This share decrease is due to new engines and a winter B20 interruption in 2014. Steps are being taken to reverse this trend.

UNH used over 450,000 gallons of B20 over the past eight years. This translates to a petroleum diesel consumption reduction of just over 90,000 gallons and estimated emission savings of 2,000 tons6 of CO2 with minor incremental fuel cost increase. (The nine year average price of B20 vs ULSD is par. In FY15 B20 priced below standard diesel - so use of B20 saved \$ as well as reduced emissions!)

UNH Diesel Fleet - Diesel, B20 and overall Biofuel Use (gallons)

Table with 7 columns: Fiscal Year, Petrodiesel, B20 Biodiesel, Combined, B20 share of diesel fueling, Petrodiesel, Biofuel. Rows include years 2007, 2009, 2011, 2013, 2014, 2015, and 2016 proj.

UNH-Durham fleet consists of just over 320 on-road registered non-farm vehicles (20% diesel). Approximately 12% of the overall fleet is hybrid or uses alternative fuel8 - our Eco-Cat™ fleet - part of our climate education practice. UNH strives to exceed EPA requirements and state fleet efficiency goals. The UNH vehicle fleet has reduced petroleum use with both environmental and fiscal benefit. After heating, cooling and electricity, fleet fuel use is one of UNH's biggest energy uses.

6 Based on 9 lbs./gallon decrease in CO2 emission B20 versus petro-diesel.

7 New methodology and future accounting excludes WENH, Granite State College, NHPTV and Systems office as of FY 2011

8 Alternative is defined as propane, CNG or all-electric not b20 use - vehicle count - not mileage (mileage would be higher %).



Overall Fleet Fuel Consumption and Mileage - FY 2015 Update

UNH has been a leader in alternative fuel fleet as part of its Eco-Cat™ program and as a recipient of USDOT, USDOE and EPA funding for alternatively fueled vehicles and infrastructure – mainly CNG and B20 biodiesel.

UNH worked cooperatively with the NHDOT to coordinate the first ultra-low sulfur B20 fuel supply at any state operated fueling facility. In August 2006, the facility, located at the UNH campus, opened and UNH began a conversion of its diesel fleet to year-round B20 operation. In FY 15, UNH used B20 for approximately 60% of its diesel engine requirements (down from a high of 85% in 2013 due to new engine warranty restrictions). This equated to an eight year total of over 450,000 gals B20 – or a reduction of just over 90,000 gallons of petroleum diesel consumed and an estimated emissions savings of 2,000 tons⁹ of CO₂ with minor net incremental fuel cost increase. *(The nine year average price of B20 vs ULSD is par. (In FY 2015 B20 priced below standard ULSD on the market – so use of B20 saved \$ as well as reduced emissions!)*

In fall 2015, the university completed an eleven year program to expand its CNG fueling and maintenance infrastructure permitting full maintenance and timely fueling of its growing CNG fleet. In the past decade, the use of CNG has led to a reduction of nearly 275,000 gallon equivalents of gas/diesel fuel with an estimate net fleet fuel savings of over \$384,000 and estimated emissions savings of 1,500 tons of CO₂.

As of July 2015, UNH-Durham operates a fleet of just under 340 vehicles including licensed farm equipment. Approx. 12% of the fleet is hybrid or uses alternative fuel¹¹ - our growing EcoCat™ fleet – part of our climate initiative.

UNH Fleet Mileage (All fleet)				
Fiscal Year	Total Odometer Miles ¹	% change from previous	Transit Service Miles	Transit Share miles
2011 UNH only. ¹⁰	1,512,268	--	501,619	33%
2012 UNH only	1,590,764	+5.1	495,393	31%
2013 UNH only	1,634,434	+2.7	585,995	36%
2014 UNH only	1,641,381	--	630,750	38%
2015 UNH only	1,825,844	+11%	622,736	34%

UNH Fleet Fuel Consumption (All Fuels)					
Fiscal Year	Gallon Equivalents ¹²	Cost Dollars ¹³	% Change (gal/gge) from previous	% Change (\$) from previous	Transit Share (gge)
2011 UNH only ¹⁰	222,144	\$623,892	--	--	45%
2012 UNH only	213,024	\$624,387	-3%	0%	51%
2013 UNH only	242,101	\$734,158	+14%	+18%	52%
2014 UNH only	264,030	\$805,649	+9%	+10%	54%
2015 UNH only	263,878	\$705,296	--	-12%	53%

UNH estimates a 10 year CO₂ emissions reduction of 3,500 tons due to its AFV fleet.

⁹ Based on 9 lbs./gallon decrease in CO₂ emission B20 versus petro-diesel and 10 lb/gallon decrease CNG versus liquid fuels.

¹⁰ Excluding Systems, Granite State College, UNH-M, GSS, Systems and WENH effective 7/1/11

¹¹ Alternative defined as propane, CNG, electric & hybrid but not b20 using vehicle count not mileage (mileage would be higher %).

¹² Combined unleaded gas, petrodiesel, B20 and CNG (expressed gge).

¹³ NHDOT invoices for liquid fuel plus CNG station invoices from UNH BSC