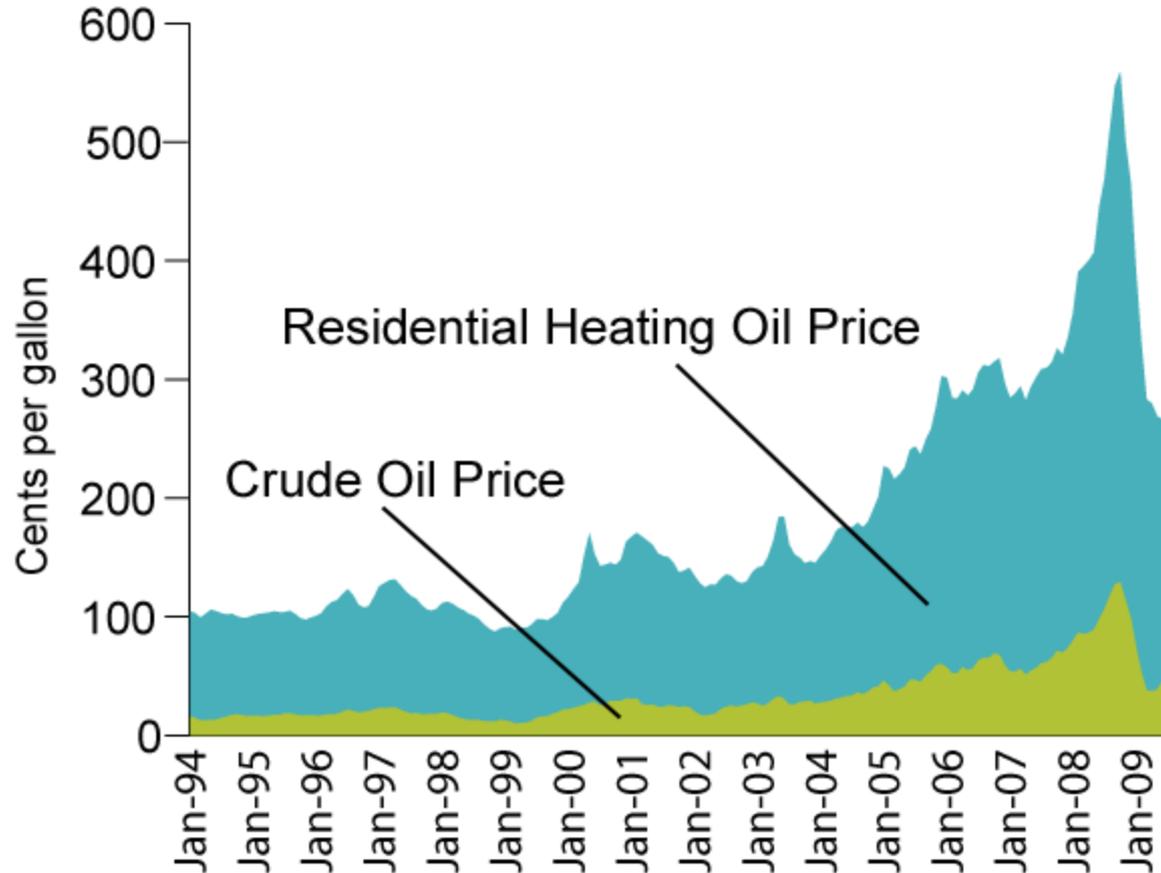


A Review of Oil Prices

Proposed Montpelier District
Heating Project
Montpelier, Vermont

Harold Garabedian
Energy & Environmental Analytics
1 June 2011

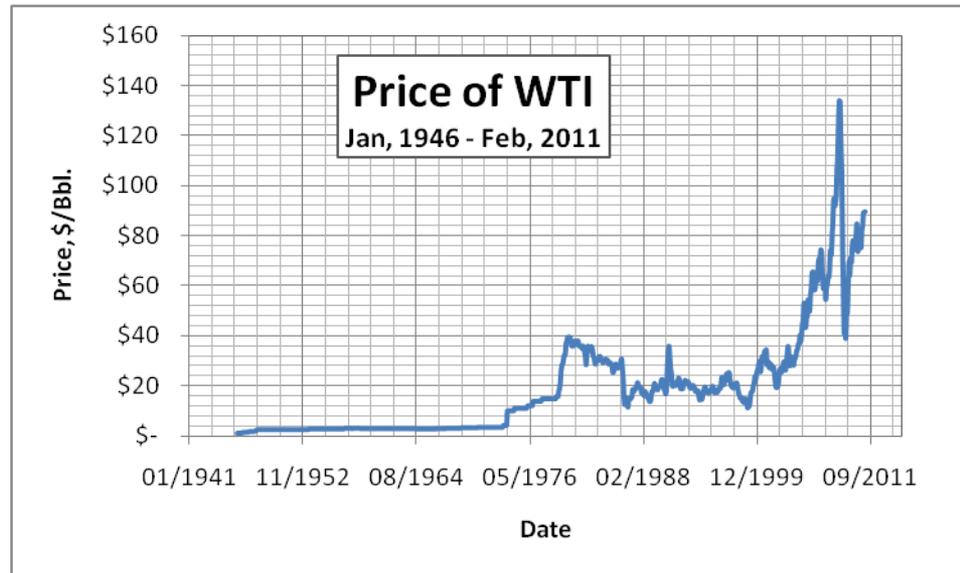
Heating Oil Prices Follow Crude Oil Prices, 1994-2009



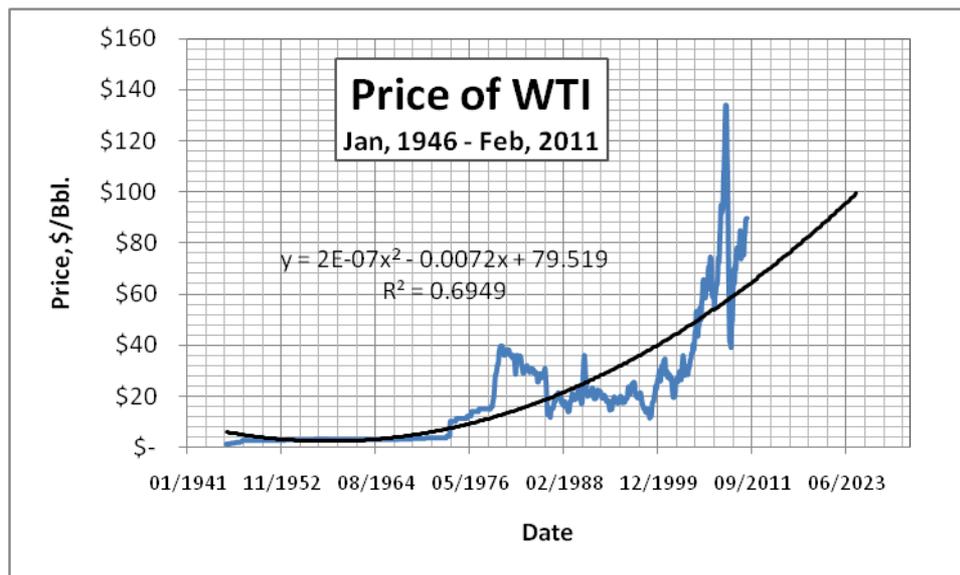
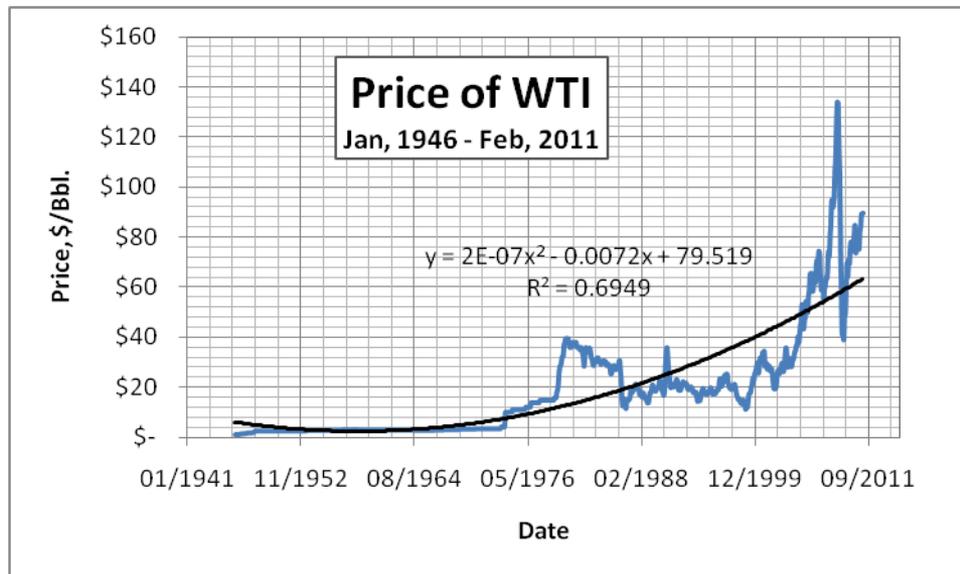
Source: Energy Information Administration, *Petroleum Marketing Monthly* (January 1995 to present).

Crude oil is generally tracked as West Texas Intermediate (WTI) or Cushing OK

Pricing of WTI, a commonly referenced 'benchmark' for fuel oil pricing



WTI Pricing is variable , but follows a general increasing trend



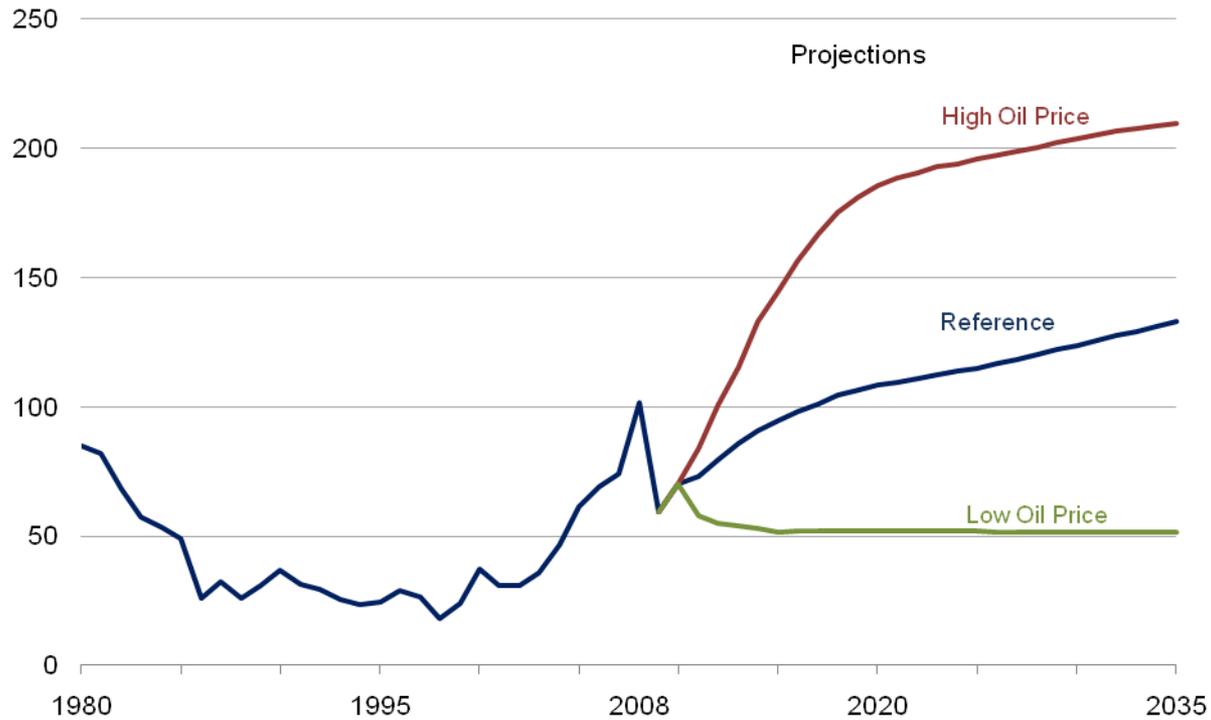
Same story with Cushing, OK data
another common 'benchmark'



U. S. Energy Information Agency Produces each year Annual Energy Outlook; AEO 2011

Figure 16. Average annual world oil prices in three cases, 2005-2035

2008 dollars per barrel



How has EIA done with their AEO projections in the past?

Table 4. World Oil Prices, Projected vs. Actual

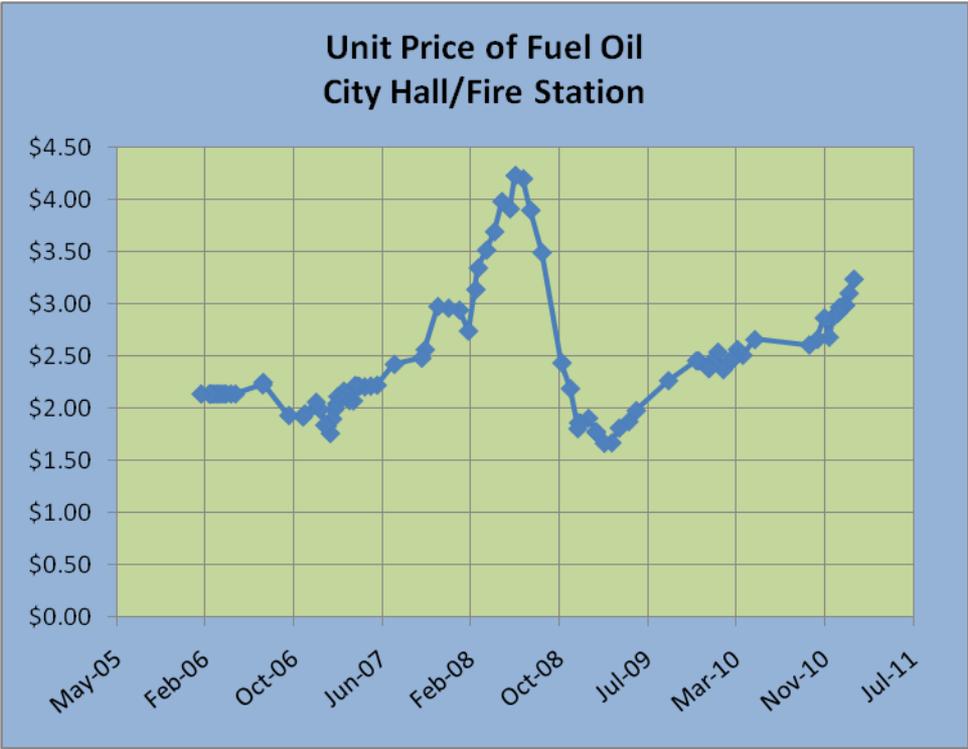
(percent difference)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
AEO 1982	9.9	148.7	128.5	229.9	197.3	171.4					492.7									
AEO 1983	7.4	110.0	80.2	170.0	154.8	144.6					331.0									
AEO 1984	7.7	110.0	70.8	133.2	105.9	87.6														
AEO 1985	0.0	84.7	36.9	78.9	64.2	55.1	97.7	122.7	165.8	202.5	189.6									
AEO 1986		4.1	-12.5	18.8	4.3	-5.2	19.0	39.4	84.3	124.7	132.9	117.3	168.3	351.0	241.7	132.5				
AEO 1987			-0.1	18.8	4.6	-8.4	11.8	19.6	48.7	77.3	86.9					108.4				
AEO 1989*				1.0	-17.4	-24.9	-5.1	5.2	34.3	62.5	68.7	61.3	104.1	252.7	168.6	80.4				
AEO 1990					-2.1	-19.6					55.1					66.7				
AEO 1991						1.1	32.4	40.6	63.9	76.3	65.5	42.6	64.8	166.0	98.6	33.2	81.1	82.8	69.9	42.0
AEO 1992							1.8	10.2	28.0	43.6	41.2	27.5	54.7	158.9	96.7	33.4	81.4	81.2	66.2	37.0
AEO 1993								3.6	25.5	36.9	31.0	14.7	35.0	121.8	65.9	12.0	52.2	53.0	40.4	14.8
AEO 1994									5.7	10.9	6.4	-5.9	11.4	83.7	37.7	-7.9	25.0	25.1	15.0	-5.3
AEO 1995											0.8	-11.7	4.0	69.4	25.1	-17.1	10.6	8.8	-1.6	-19.7
AEO 1996											0.1	-14.0	0.3	63.8	21.5	-19.3	8.2	6.5	-3.6	-21.4
AEO 1997												-3.1	4.8	62.4	16.3	-25.7	-1.5	-4.2	-14.3	-31.0
AEO 1998													0.0	56.1	15.1	-24.4	-1.0	-5.0	-15.3	-32.2
AEO 1999														3.8	-21.0	-47.0	-25.7	-24.6	-29.1	-41.1
AEO 2000															0.5	-21.3	-4.6	-9.2	-20.4	-37.0
AEO 2001																1.8	13.0	-3.7	-19.3	-35.8
AEO 2002																	4.5	-7.3	-13.4	-30.8
AEO 2003																		-0.3	-2.9	-28.4
AEO 2004																			-0.2	-31.7
AEO 2005																				-0.4
AEO 2006																				
AEO 2007																				
AEO 2008																				
Average Absolute Percent Difference (All AEOs)	6.3	91.5	54.8	93.0	68.8	57.5	28.0	34.5	57.0	70.7	115.5	33.1	44.7	126.3	67.4	42.1	25.7	24.0	22.3	27.2

Overestimate

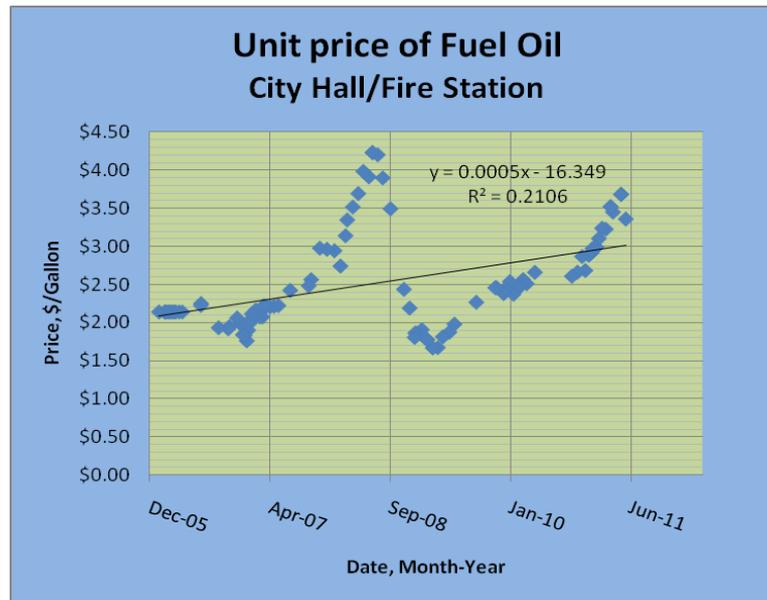
Underestimate

Recent years have under estimated the price of oil.

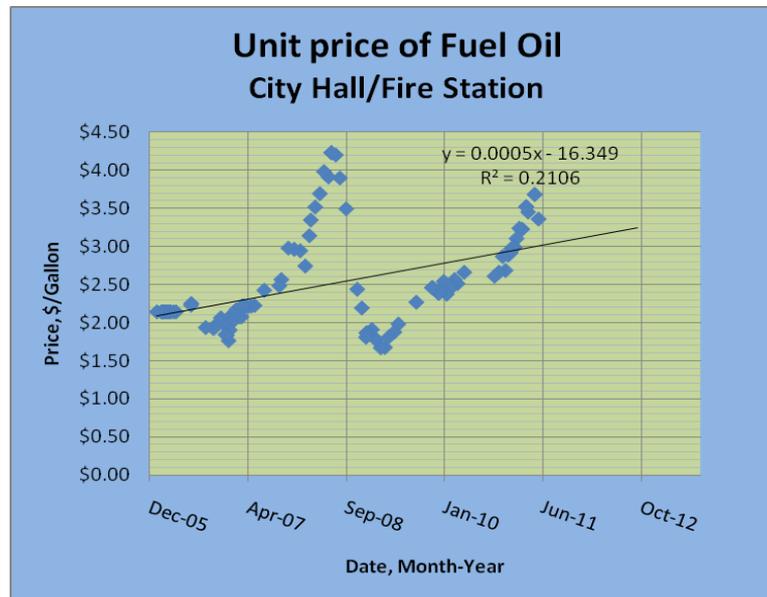
Historical Price Paid for Fuel Oil; City Hall 2006 to present



While variable, it has increased at an average rate of 7.7% per year

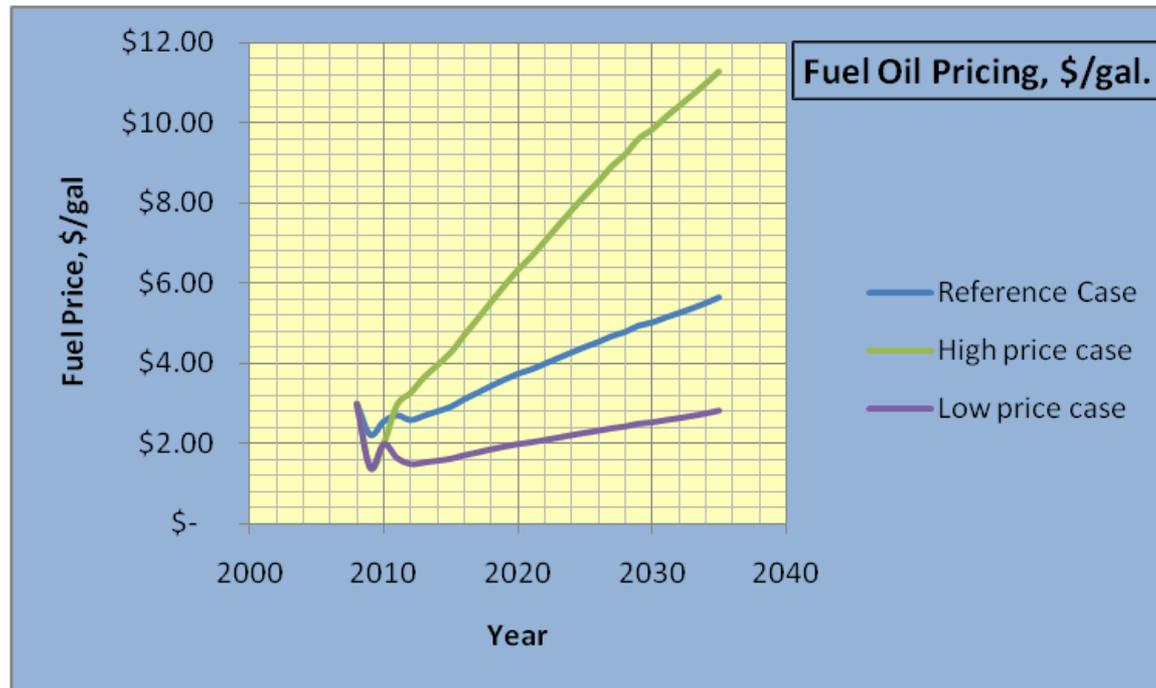


While price are expected to fluctuate, an increasing trend is indicated

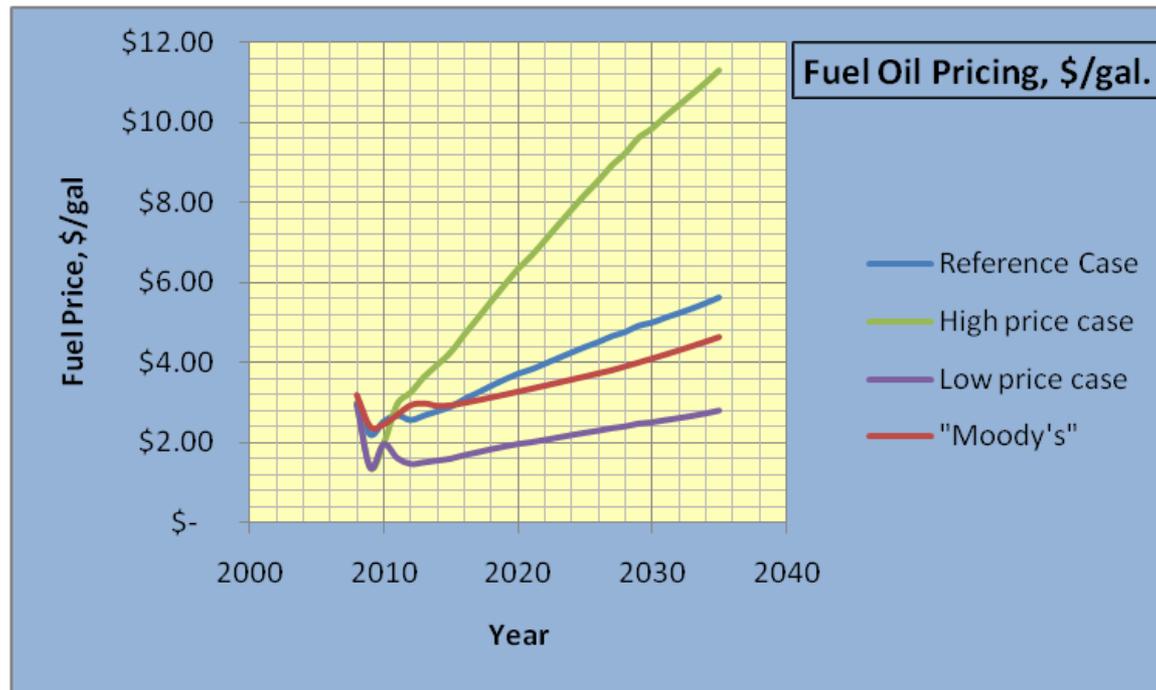


What does this mean to the case at hand?

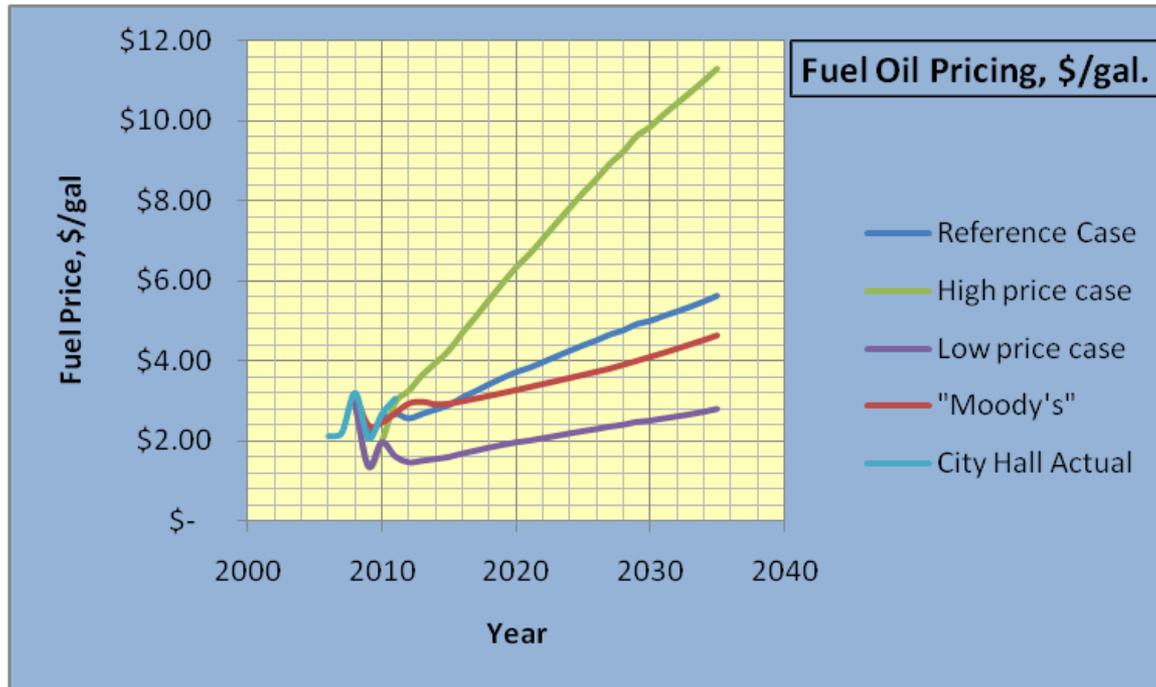
We can translate the EIA's AEO forecasts of crude oil to refined product, and present it as the three cases



Can overlay the fuel price forecast using in analysis of District Heat Project

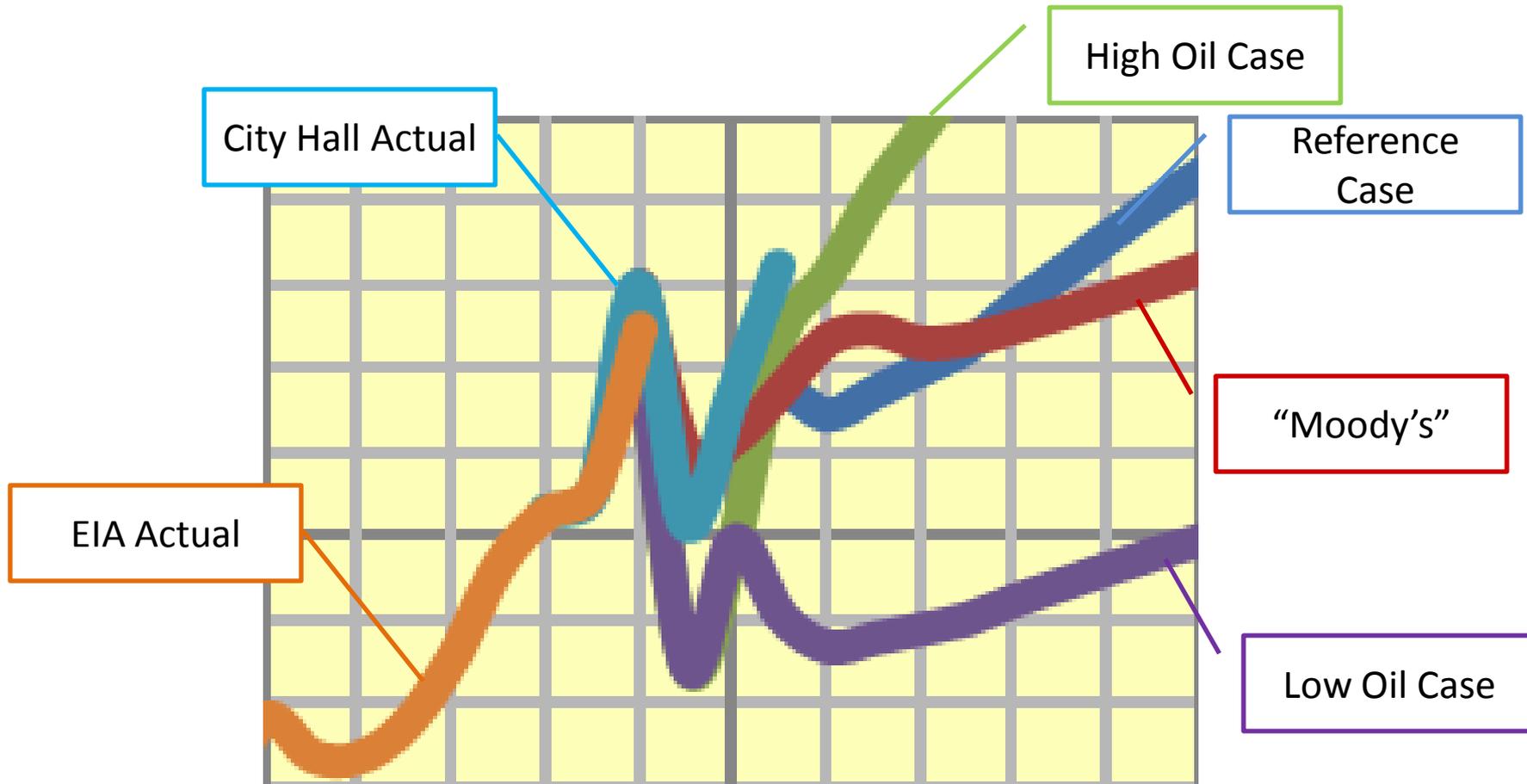


And then can overlay actual fuel prices (City Hall)



“Moody’s” is what has been used to benchmark the future price oil in analysis.

Comparison of actual oil prices paid to forecasts



The actual price being paid for fuel oil is running ahead of EIA's high forecast