



Town of Woodbridge Beecher Road School



Energy Upgrade Update

January 25, 2017



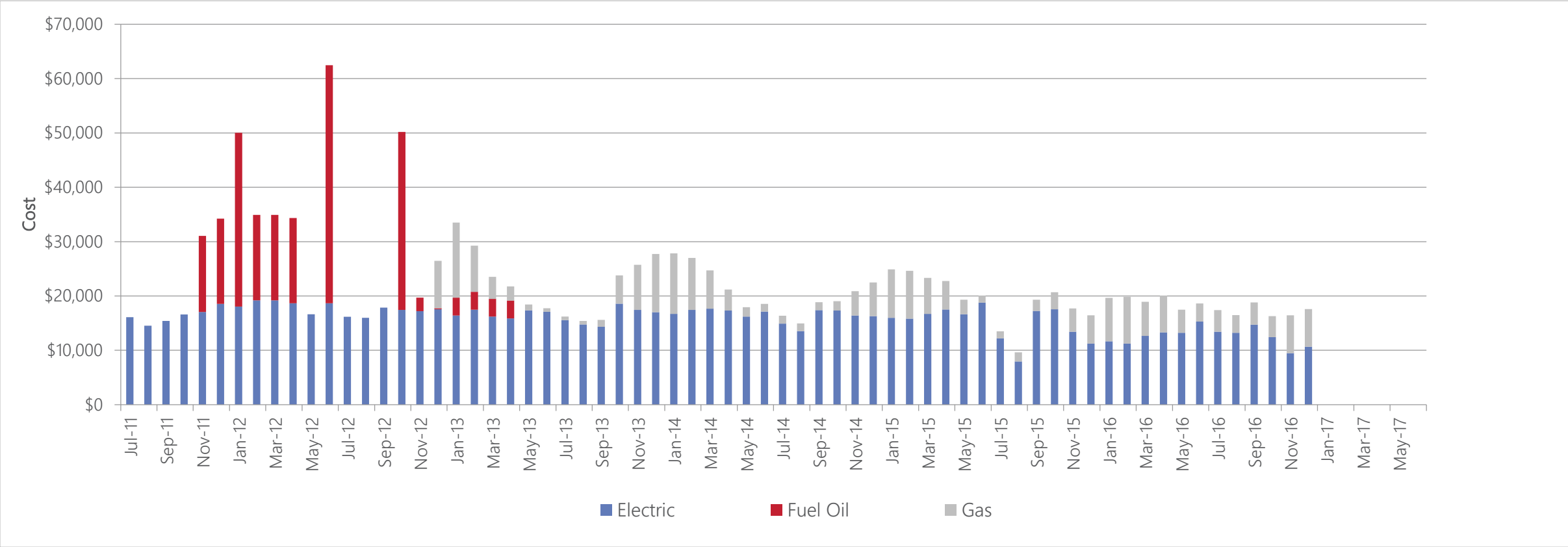
AKF

John B. Rice, PE, LEED AP
Francisco Arias

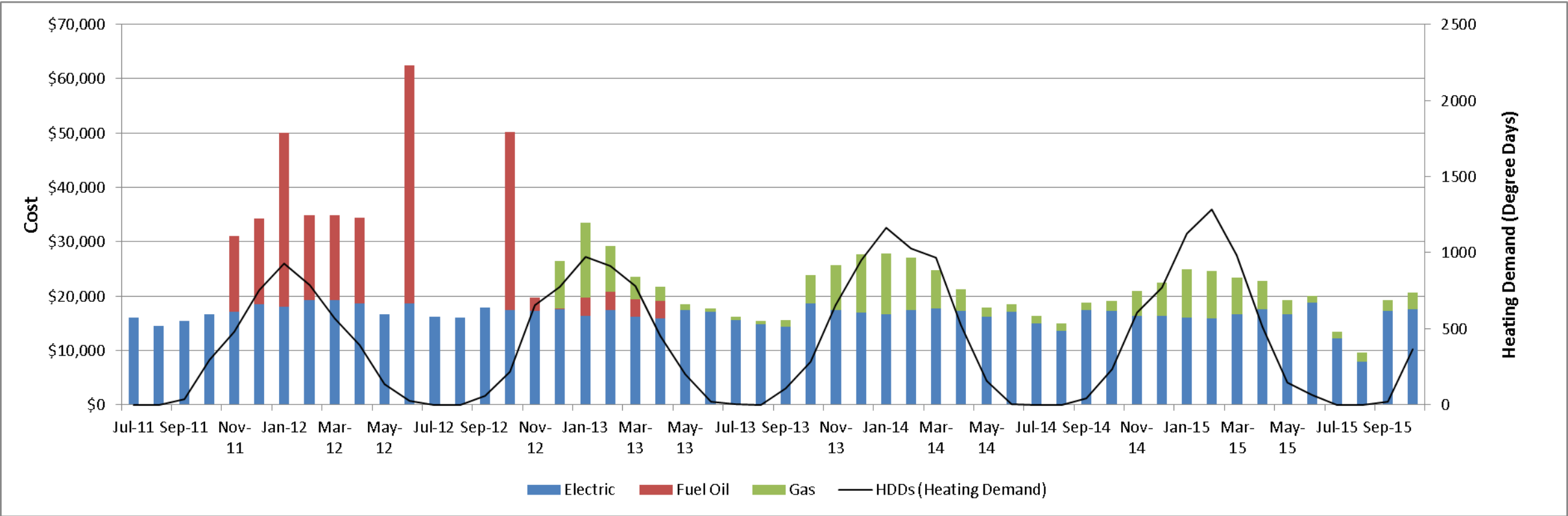
Energy Efficiency Measure	Elec		Oil		Gas		Annual Energy Cost	Energy Cost Savings	
	\$	KWH	\$	Gallons	\$	Therms		\$	%
Base Building	\$ 223,649	1,102,952	\$ 163,336	59,830	\$ -		\$ 386,985	n/a	n/a
Photovoltaic Solar Energy	\$ 196,731	956,952	\$ 163,336				\$ 360,067	\$ 26,918	7.0%
Wind Turbine	\$ 221,975	1,091,944	\$ 163,336	59,830			\$ 385,311	\$ 1,675	0.4%
Solar Thermal Water Heating	\$ 224,033	1,102,952	\$ 161,562	55,278			\$ 385,596	\$ 1,390	0.4%
Micro-Turbine	\$ 103,858	555,392	\$ 120,848		\$ 77,332		\$ 302,039	\$ 84,946	22.0%
Roof Replacement	\$ 224,033	1,102,952	\$ 134,592	49,301			\$ 358,625	\$ 28,360	7.3%
Curtain Wall Upgrade	\$ 224,033	1,102,952	\$ 149,687	54,830			\$ 373,720	\$ 13,265	3.4%
Replacement Gas Boilers	\$ 259,331	1,096,222			\$ 85,537	72,822	\$ 344,868	\$ 42,118	10.9%
Geothermal Heat Pump System	\$ 361,878	1,654,001	\$ 3,756	1,376			\$ 365,633	\$ 21,352	5.5%
BMS Controls	\$ 205,871	1,005,826	\$ 163,336				\$ 369,207	\$ 17,779	4.6%
Lighting Controls	\$ 211,750	851,179	\$ 163,336				\$ 375,086	\$ 11,899	3.1%
All ECM's	\$ 81,952	438,249			\$129,517	107,931	\$ 211,470	\$ 175,516	45.4%

Full Building Air Conditioning Alternate Schemes	Elec		Oil		Gas		Annual Energy Cost	Energy Cost Savings versus Base Building		Energy Cost Savings versus Hi-Eff'y System	
	\$	KWH	\$	Gallons	\$	Therms		\$	%	\$	%
Base Building w/Full Air Conditioning	\$ 333,050	1,604,927	\$ 163,336	59,830			\$ 496,386	n/a	n/a	n/a	n/a
High Efficiency Gas Boiler & Air-Cooled Chiller	\$ 311,865	1,491,641			\$ 93,813	78,178	\$ 405,678	\$ 90,707	18.3%	n/a	n/a
Geothermal Heat Pump System	\$ 404,938	1,989,357	\$ 3,756	1,376			\$ 408,694	\$ 87,692	17.7%	\$ (3,015)	-3.3%

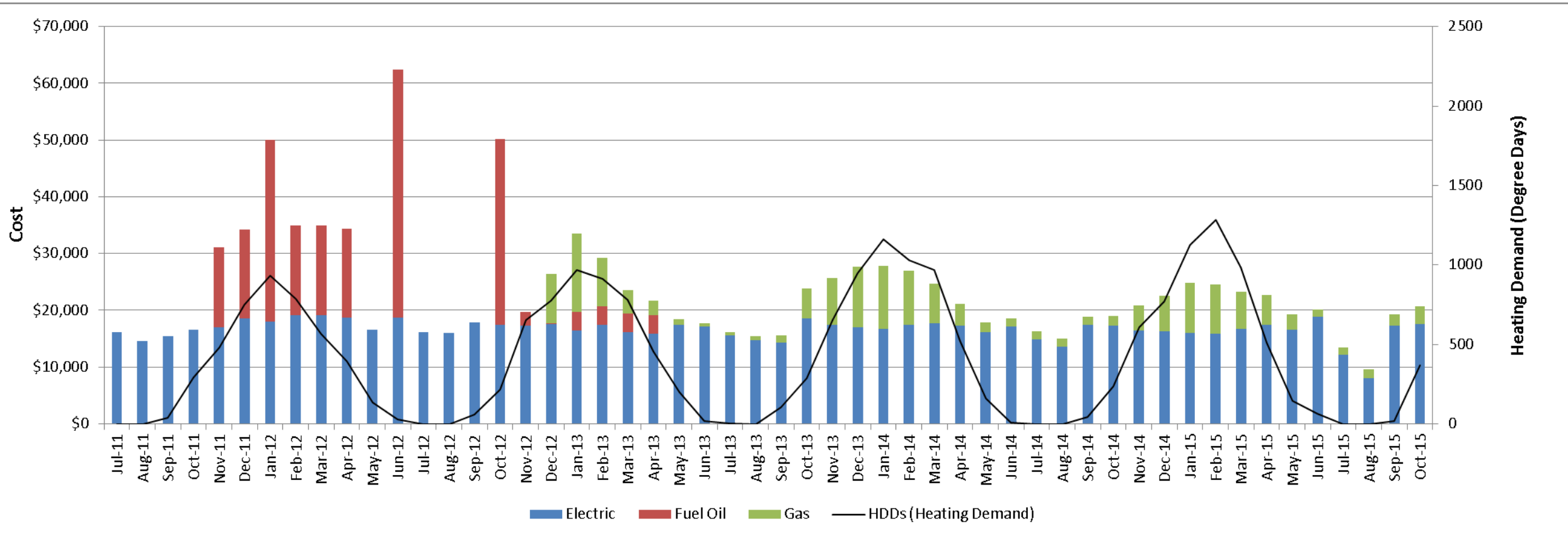
Monthly Utility Cost by Fuel



Monthly Utility Cost by Fuel



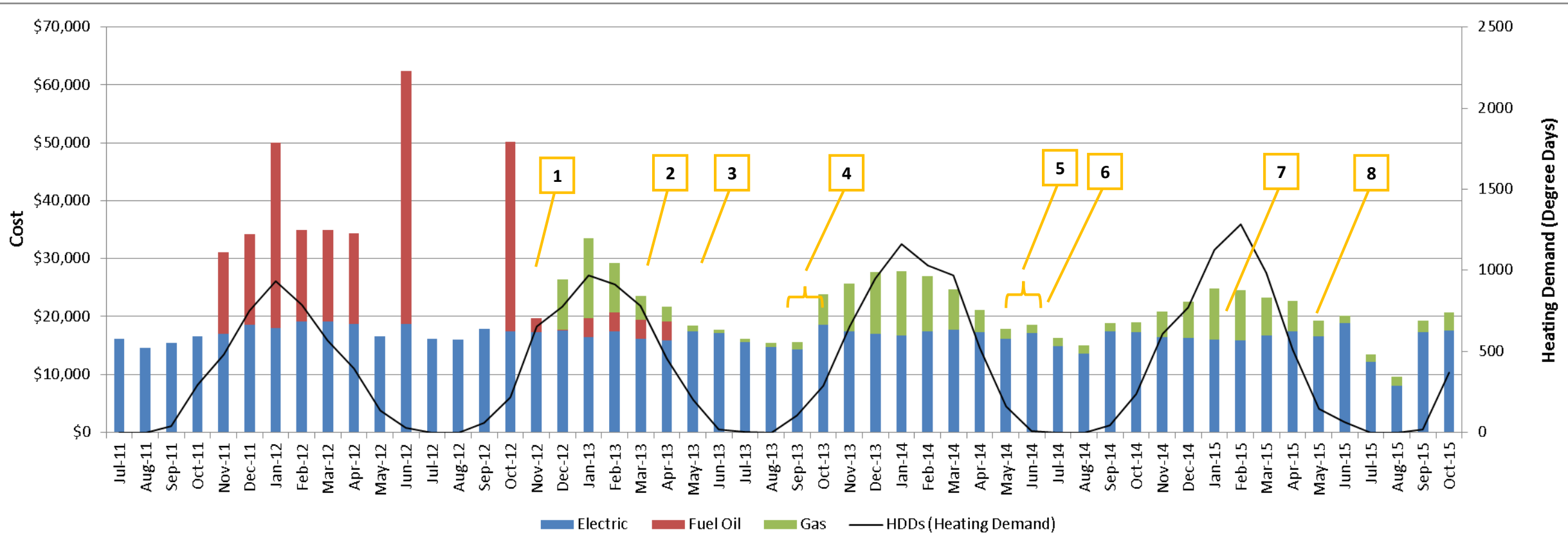
Monthly Utility Cost by Fuel



Project Milestones:

1. 2012: SCG brings gas service & BRS converts 1 existing boiler to gas.
2. Dec. 2013: Emergency replacement of boilers with gas boilers.
3. Feb. 2014: Referendum passes for energy performance contract project.
4. Summer 2014: Construction Phase 1 (Window walls, roof, fan coil units).
5. Summer 2015: Construction Phase 2 (Lighting, mechanical upgrades, controls).
6. Sept. 2015: Micro-turbine comes online.
7. July 2016: Solar PV comes online.
8. Dec. 2016: Construction completion (Commissioning, balancing, controls completion & acceptance).

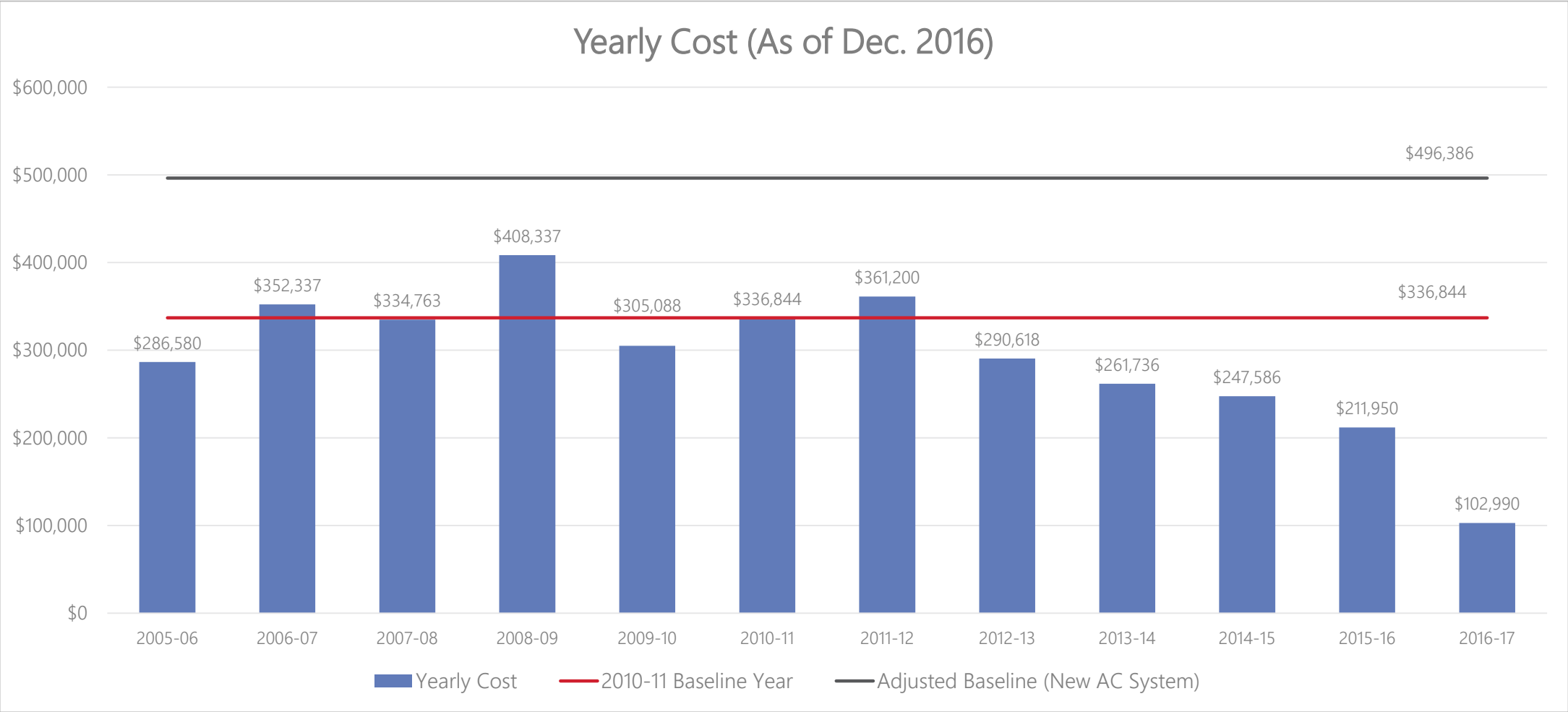
Monthly Utility Cost by Fuel



Project Milestones:

1. 2012: SCG brings new gas.
2. Dec. 2013: Emergency replacement to gas boilers.
3. Feb. 2014: Referendum passes for EPC Project.
4. Summer 2014: Construction Phase 1 (Window walls, roof, fan coil units).
5. Summer 2015: Construction Phase 2 (Lighting, mechanical upgrades, controls).
6. Sept. 2015: Micro-turbine comes online.
7. July 2016: Solar PV comes online.
8. Dec. 2016: Construction completion

Yearly Cost – All Utilities



DATE	Electric			Fuel Oil			Natural Gas			TOTAL ANNUAL COST
	KWH	COST	\$/KWH	GALLONS	COST	\$/GAL	THERMS	COST	\$/THERM	
2005-06	1,398,081	\$182,898	\$ 0.131	60,465	\$103,682	\$1.71	-	\$ -	\$ -	\$ 286,580
2006-07	1,217,328	\$215,391	\$ 0.177	60,171	\$136,946	\$2.28	-	\$ -	\$ -	\$ 352,337
2007-08	1,237,885	\$222,898	\$ 0.180	56,537	\$111,865	\$1.98	-	\$ -	\$ -	\$ 334,763
2008-09	1,148,868	\$215,864	\$ 0.188	58,488	\$192,473	\$3.29	-	\$ -	\$ -	\$ 408,337
2009-10	1,111,586	\$203,260	\$ 0.183	52,432	\$101,828	\$1.94	-	\$ -	\$ -	\$ 305,088
2010-11	1,131,238	\$219,570	\$ 0.194	56,578	\$117,274	\$2.07	-	\$ -	\$ -	\$ 336,844
2011-12	1,127,343	\$208,607	\$ 0.185	55,000	\$152,593	\$2.77	-	\$ -	\$ -	\$ 361,200
2012-13	1,160,919	\$202,744	\$ 0.175	18,499	\$48,485	\$2.62	61,320	\$ 39,389	\$ 0.642	\$ 290,618
2013-14	1,159,482	\$200,172	\$ 0.173	-	-	-	87,550	\$ 61,564	\$ 0.703	\$ 261,736
2014-15	1,009,430	\$197,306	\$ 0.195	-	-	-	74,040	\$ 50,280	\$ 0.679	\$ 247,586
2015-16	956,047	\$156,941	\$ 0.164	-	-	-	76,892	\$ 55,009	\$ 0.715	\$ 211,950
2016-17	447,613	\$73,958	\$ 0.165	-	-	-	37,907	\$ 29,032	\$ 0.766	\$ 102,990