



Building Energy Analysis Report

Report Generated by Efilm, an EnergyPlus based program.

Date: 6/8/2012

Project Information

Title: Building Filmed in 2012

Address:

City/State/Zip: New York, NY 10001

Analyst

Name: Bill Pettit LEED AP

Company: 3M Company

Address: 3M Center Bldg 235-3D-02

City/State/Zip: St Paul, MN 55119

Building Owner

Name:

Phone:

Address:

City/State/Zip: New York, NY 10001

Architect

Name:

Phone:

Address:

City/State/Zip:

Building Information

Building Type: Office Buildings - Large

Building Shape: Rectangular

Orientation: North

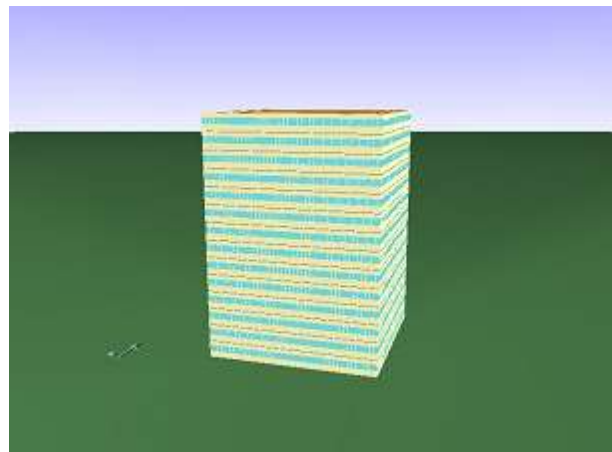
Number of Floors: 14

Floor-to-Floor Height: 16.28 ft

Conditioned Area: 390,000 ft²

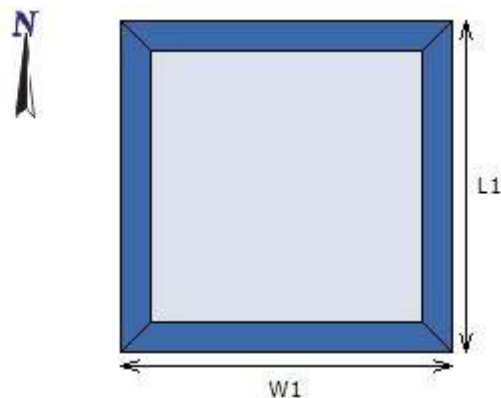
Vintage: Pre-1978

Category: Non-Residential



Dimensions

W1: 167.06 ft L1: 166.75 ft





Efilm computer program is based on EnergyPlus simulation engine, which is developed under the continuous funding of United States Department of Energy (U.S. DOE). EnergyPlus is considered the most detailed and accurate energy simulation program on the market. EnergyPlus incorporates the best features of DOE 2.1E and BLAST and is also enhanced with the use of latest programming techniques and latest generation of FORTRAN compilers. The program has been thoroughly tested and validated, and DOE is pledging full support only for the program developments in the future. For more details and features of EnergyPlus can be accessed from:

http://apps1.eere.energy.gov/buildings/energyplus/energyplus_about.cfm

IWFA E*film* Disclaimer

Please be advised that the figures generated by Efilm regarding energy costs and potential energy cost savings are only estimates. Actual results may vary, perhaps significantly, depending upon, among other things, changes in weather patterns, climate or topography, issues with a particular building's envelope, the efficiency of a building's heating and cooling systems, and the type and quality of film applied. The International Window Film Association and its members disclaim any responsibility or liability for any damages or injuries, financial or otherwise, that may be claimed to arise from the accuracy or inaccuracy of the estimates calculated by the Efilm software.



Results Summary

Option	Gas	Electricity	Total (Site)	Total (Source)	Savings
<i>Energy Totals</i>					
Base Case	18,555 MBTU	8,945,572 kWh	49,078 MBTU	116,808 MBTU	
Night Vision 15	17,778 MBTU	7,895,114 kWh	44,717 MBTU	104,623 MBTU	12,185 MBTU
P18	17,488 MBTU	7,744,528 kWh	43,913 MBTU	102,680 MBTU	14,128 MBTU
Affinity 15	17,939 MBTU	7,774,147 kWh	44,466 MBTU	103,493 MBTU	13,315 MBTU
<i>Energy/Area</i>					
Base Case	47.61 kBtu/ft ²	22.94 kWh/ft ²	125.93 kBtu/ft ²	299.71 kBtu/ft ²	
Night Vision 15	45.62 kBtu/ft ²	20.24 kWh/ft ²	114.74 kBtu/ft ²	268.44 kBtu/ft ²	31.27 kBtu/ft ²
P18	44.87 kBtu/ft ²	19.86 kWh/ft ²	112.67 kBtu/ft ²	263.46 kBtu/ft ²	36.25 kBtu/ft ²
Affinity 15	46.03 kBtu/ft ²	19.93 kWh/ft ²	114.09 kBtu/ft ²	265.54 kBtu/ft ²	34.16 kBtu/ft ²
<i>Peak Demand</i>					
Base Case	13,049 kBtu/hr	1,967 kW			
Night Vision 15	12,836 kBtu/hr	1,808 kW			
P18	12,718 kBtu/hr	1,784 kW			
Affinity 15	12,939 kBtu/hr	1,792 kW			
<i>Energy Cost</i>					
Base Case	\$185,549	\$1,682,333	\$1,867,882		
Night Vision 15	\$177,781	\$1,485,295	\$1,663,077		\$204,805
P18	\$174,878	\$1,457,052	\$1,631,930		\$235,952
Affinity 15	\$179,391	\$1,462,612	\$1,642,004		\$225,878
<i>Energy and HVAC Equipment Cost</i>					
Base Case	\$244,309	\$1,823,823	\$2,068,132		
Night Vision 15	\$236,224	\$1,599,354	\$1,835,577		\$232,554
P18	\$232,954	\$1,567,225	\$1,800,179		\$267,952
Affinity 15	\$238,253	\$1,573,833	\$1,812,086		\$256,046

Simple Payback

Option	Project Cost	Simple Payback Period
Base Case	\$0	
Night Vision 15	\$438,865	2.14 years
P18	\$438,865	1.86 years
Affinity 15	\$438,865	1.94 years

Building Location

Address:	
City Name:	New York
State:	NY
Zip:	10001
Climatic Zone:	ASHRAE Climatic Zone 4
Weather Location:	New York City-La Guardia, NY
Weather File Path:	\\North and Central America\\USA\\New York\\USA_NY_New.York.City-La.Guardia_TMY.zip

Internal Loads

	Office Perimeter zone	Office Core zone
Occupancy	199.99 ft ² /person	199.99 ft ² /person
Lighting	1 W/ft ²	1 W/ft ²
Electric Equipment	0.75 W/ft ²	0.75 W/ft ²

Service Water Heating

Fuel Type:	NaturalGas
Hot Water Usage:	1 gal/person/day
Heater Thermal Efficiency:	0.8

Building Constructions

Type	Name	R-Value
Walls	Light Exterior Wall	2.49 h·ft ² ·F/Btu
Roof	Built up Roof	7.03 h·ft ² ·F/Btu
Ground Floor	Light Floor	4.09 h·ft ² ·F/Btu
Walls/Partitions	Light Partitions	3.17 h·ft ² ·F/Btu
Floor/Ceiling	Light Floor/Ceiling	5.11 h·ft ² ·F/Btu

Infiltration

Zone	Value	Calculation Method
Core	0 CFM/ft ²	Flow Per Area
Perimeter	0.84 CFM/ft ²	Flow Per Exterior Wall Area

HVAC Systems

Distribution System:	Standard VAV with reheat
Cooling System:	Chilled water coils
Cooling System Efficiency:	3 COP
Heating System:	Hot Water Coils
Heating System Efficiency:	0.7
Thermostat Heating Setpoint:	70 F
Thermostat Cooling Setpoint:	75 F
Thermostat Heating Setback:	65 F
Thermostat Cooling Setback:	85 F

Utility Rates - Electric

Uniform

Energy	0.186 \$/kWh
Demand	1 \$/kWh

Utility Rates - Gas

Uniform

Energy	1 \$/Therm
Demand	0 \$/Therm

Emissions

Electricity

Source Energy Factor:	3.16
CO2 Emission Factor:	961 lb/MWh
NOx Emission Factor:	1.72 lb/MWh

Gas

Source Energy Factor:	1.09
CO2 Emission Factor:	413.5 lb/MWh
NOx Emission Factor:	0.38 lb/MWh

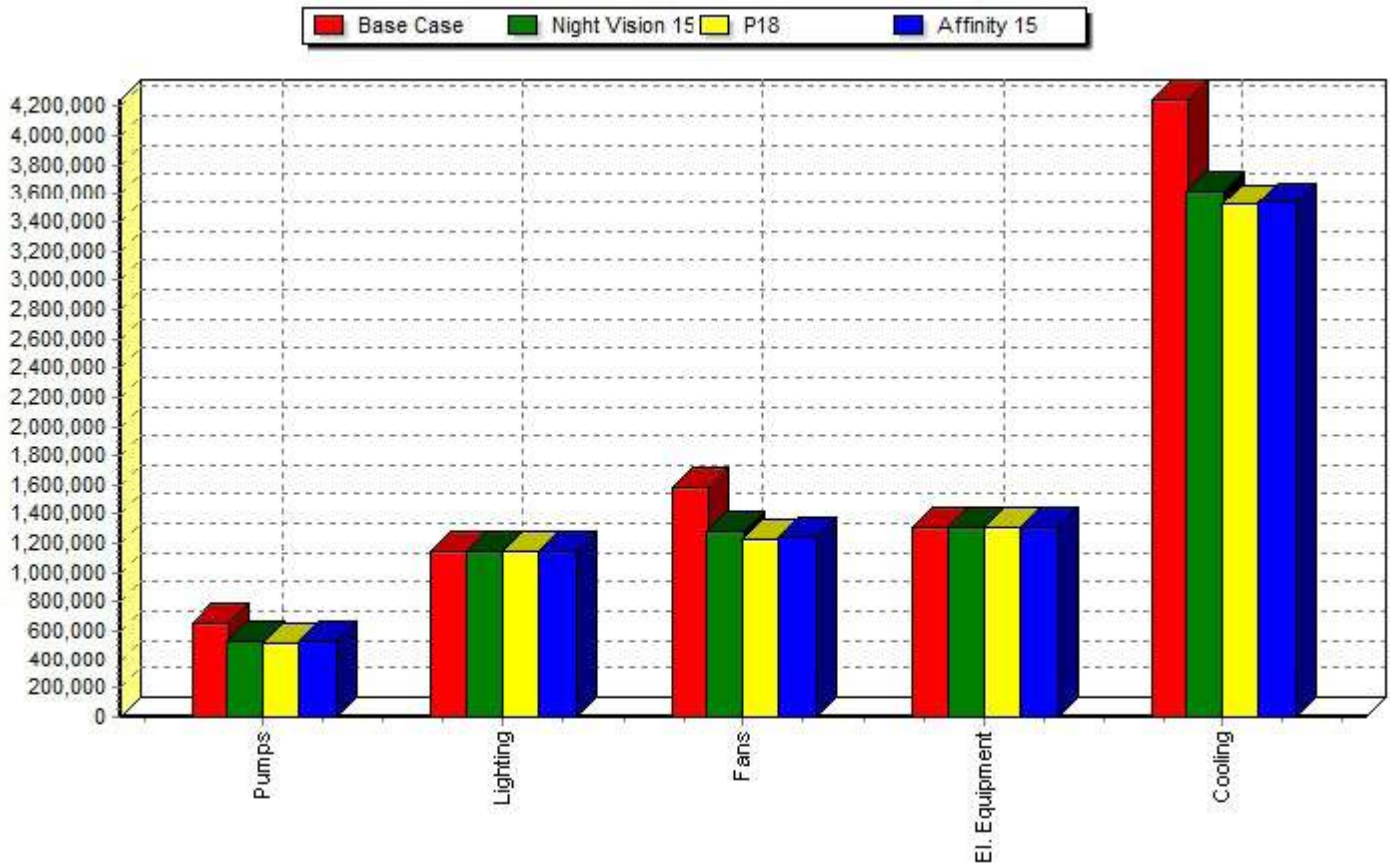
Fenestration Product Listing

Window Code	Name	Size [in.]	U-Factor [Btu/h·ft ² ·F]	SHGC	VT	Window Type	Infiltration [CFM/ft ²]
W1	1/4 Tint	47.24 x 59.06	1.14	0.6	0.44	Fixed	0.3
W2	NV15 1/4 Tint	47.24 x 59.06	1.1	0.32	0.07	Fixed	0.3
W3	Silver P18 1/4 Tint	47.24 x 59.06	1.06	0.29	0.08	Fixed	0.3
W4	Affinity 15 on 1/4 Tint	47.24 x 59.06	1.15	0.3	0.05	Fixed	0.3
D1	1/4 Clear	47.24 x 59.06	1.14	0.76	0.74	Fixed	0.3

Fenestration Product Listing - Resized Windows

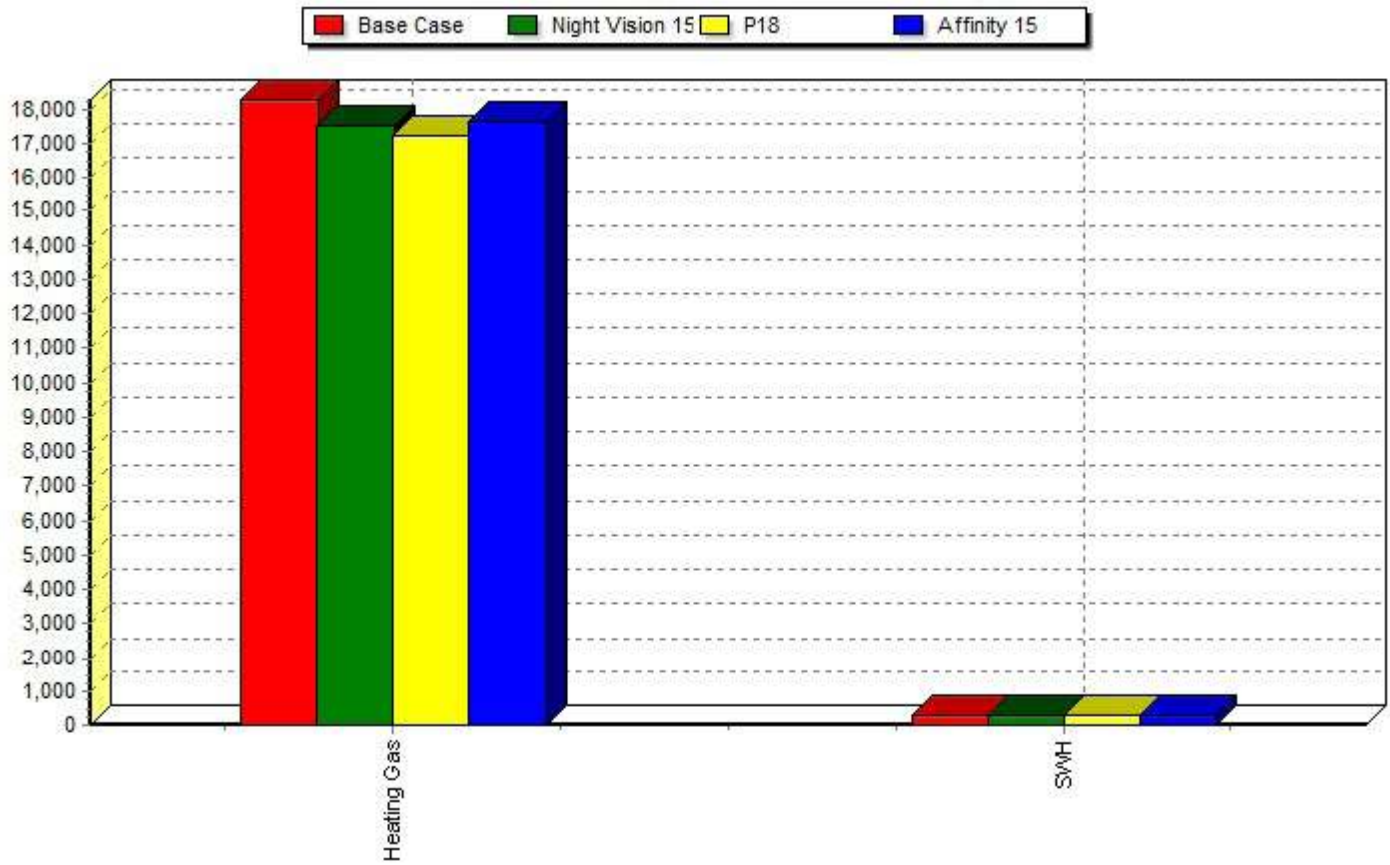
Window Code	Name	Size [in.]	U-Factor [Btu/h·ft ² ·F]	SHGC	VT	Window Type	Infiltration [CFM/ft ²]
W1	1/4 Tint	47.52 x 77.44	0.98	0.6	0.37	Fixed	0.3
W1	1/4 Tint	47.61 x 77.29	0.98	0.6	0.37	Fixed	0.3
D1	1/4 Clear	78.74 x 78.74	0.98	0.77	0.69	Fixed	0.3
W2	NV15 1/4 Tint	47.52 x 77.44	0.94	0.32	0.06	Fixed	0.3
W2	NV15 1/4 Tint	47.61 x 77.29	0.94	0.32	0.06	Fixed	0.3
W3	Silver P18 1/4 Tint	47.52 x 77.44	0.91	0.29	0.07	Fixed	0.3
W3	Silver P18 1/4 Tint	47.61 x 77.29	0.91	0.29	0.07	Fixed	0.3
W4	Affinity 15 on 1/4 Tint	47.52 x 77.44	0.99	0.3	0.04	Fixed	0.3
W4	Affinity 15 on 1/4 Tint	47.61 x 77.29	0.99	0.3	0.04	Fixed	0.3

Annual Electric Use [kWh]



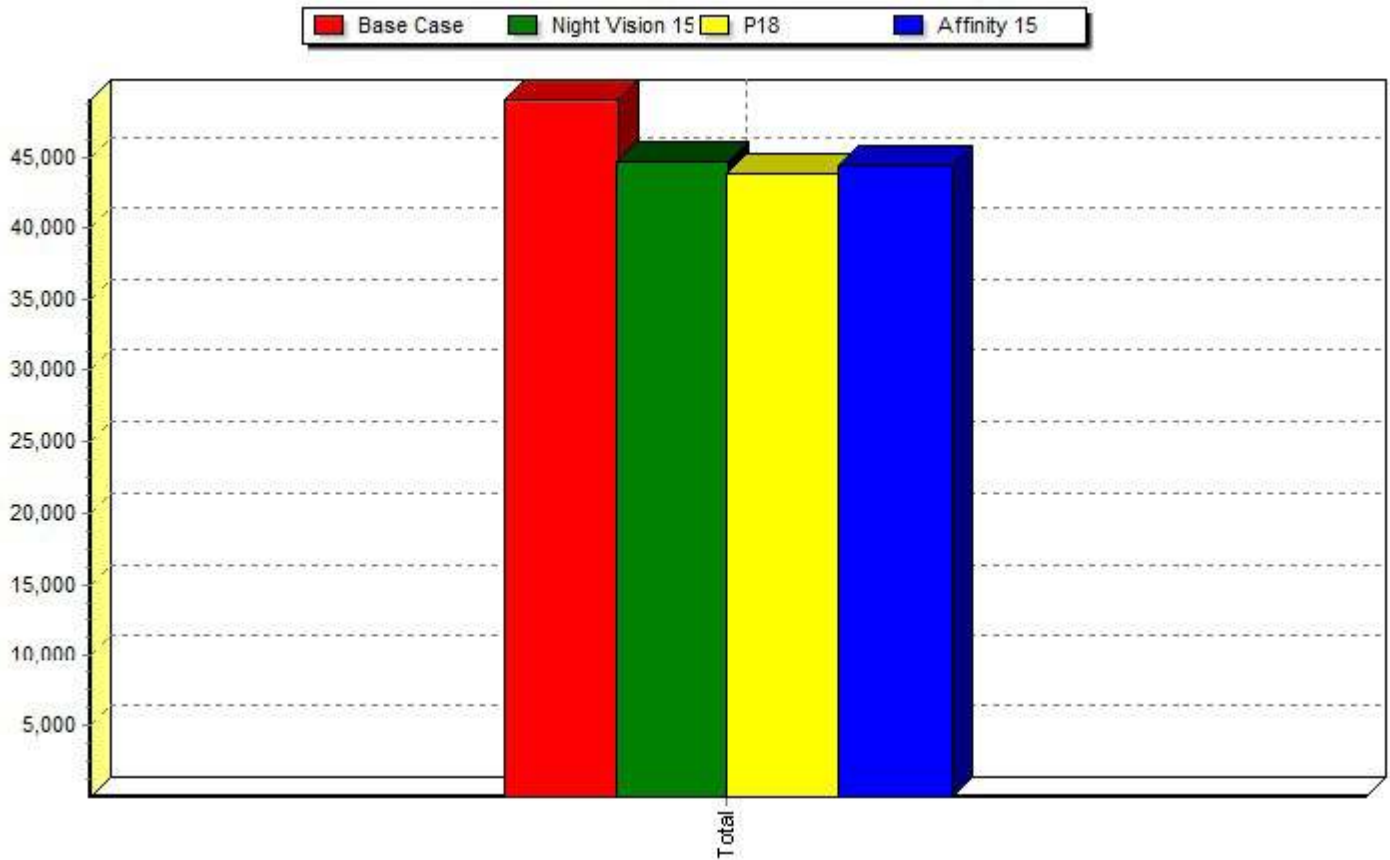
	Cooling	El. Equipment	Fans	Pumps	Lighting	Total
Base Case	4,246,475	1,316,848	1,580,854	655,114	1,146,288	8,945,579
Night Vision 15	3,616,173	1,316,848	1,277,751	538,056	1,146,288	7,895,116
Night Vision 15 - Savings	630,303		303,103	117,058		1,050,464
P18	3,525,177	1,316,848	1,234,931	521,286	1,146,288	7,744,530
P18 - Savings	721,298		345,922	133,829		1,201,049
Affinity 15	3,538,412	1,316,848	1,246,453	526,145	1,146,288	7,774,147
Affinity 15 - Savings	708,063		334,401	128,969		1,171,433

Annual Gas Use [MBTU]



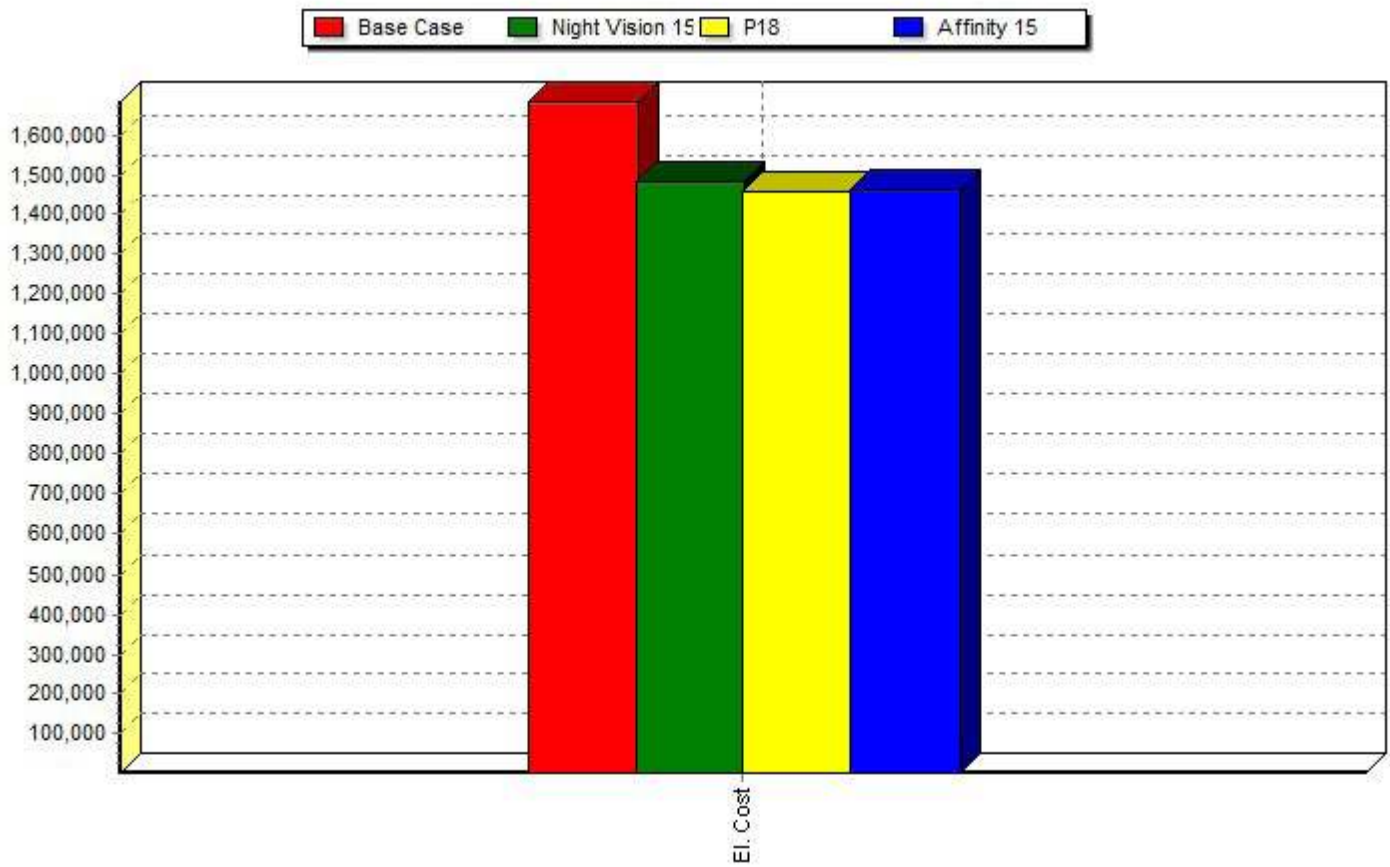
	Heating Gas	SWH	Total
Base Case	18,269	286	18,555
Night Vision 15	17,492	286	17,778
Night Vision 15 - Savings	777		777
P18	17,202	286	17,488
P18 - Savings	1,067		1,067
Affinity 15	17,653	286	17,939
Affinity 15 - Savings	616		616

Annual Total Use [MBTU]



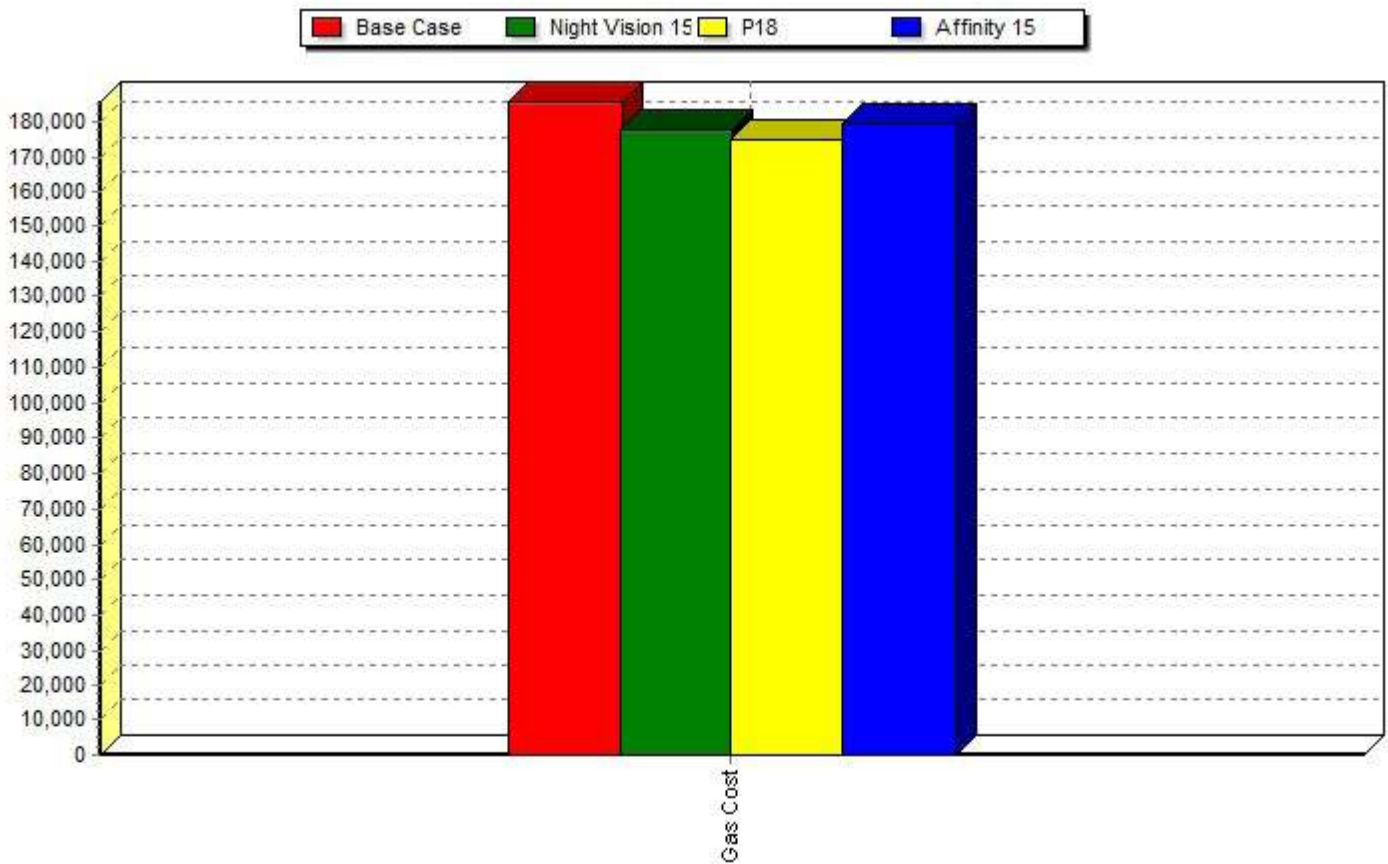
	Total
Base Case	49,078
Night Vision 15	44,717
Night Vision 15 - Savings	4,361
P18	43,913
P18 - Savings	5,165
Affinity 15	44,466
Affinity 15 - Savings	4,613

Annual Electric Cost[\$]



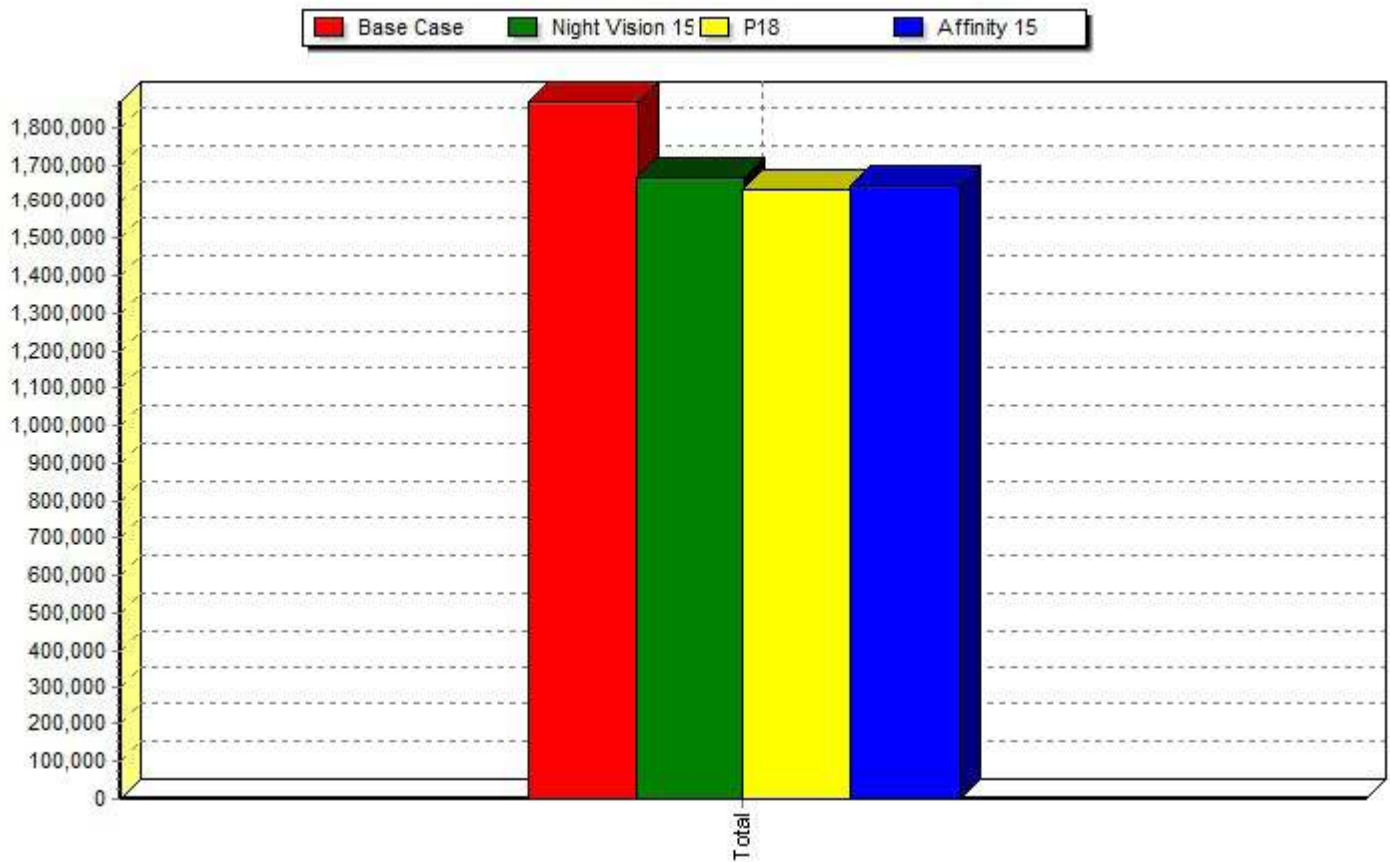
	El. Cost	Total
Base Case	1,682,333	1,682,333
Night Vision 15	1,485,295	1,485,295
Night Vision 15 - Savings	197,038	197,038
P18	1,457,052	1,457,052
P18 - Savings	225,282	225,282
Affinity 15	1,462,612	1,462,612
Affinity 15 - Savings	219,721	219,721

Annual Gas Cost [\$]



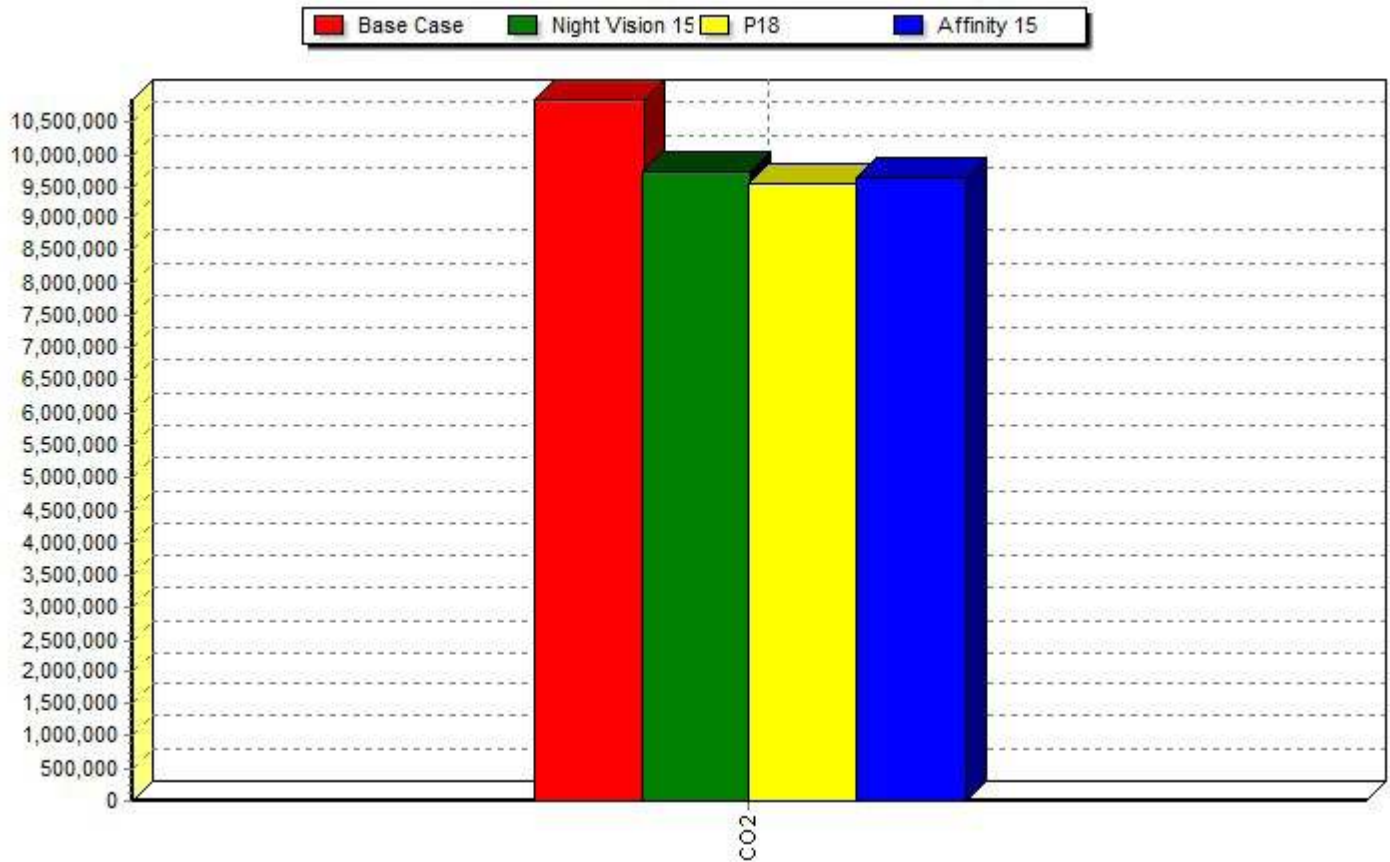
	Gas Cost	Total
Base Case	185,549	185,549
Night Vision 15	177,781	177,781
Night Vision 15 - Savings	7,767	7,767
P18	174,878	174,878
P18 - Savings	10,670	10,670
Affinity 15	179,391	179,391
Affinity 15 - Savings	6,157	6,157

Annual Total Cost [\$]



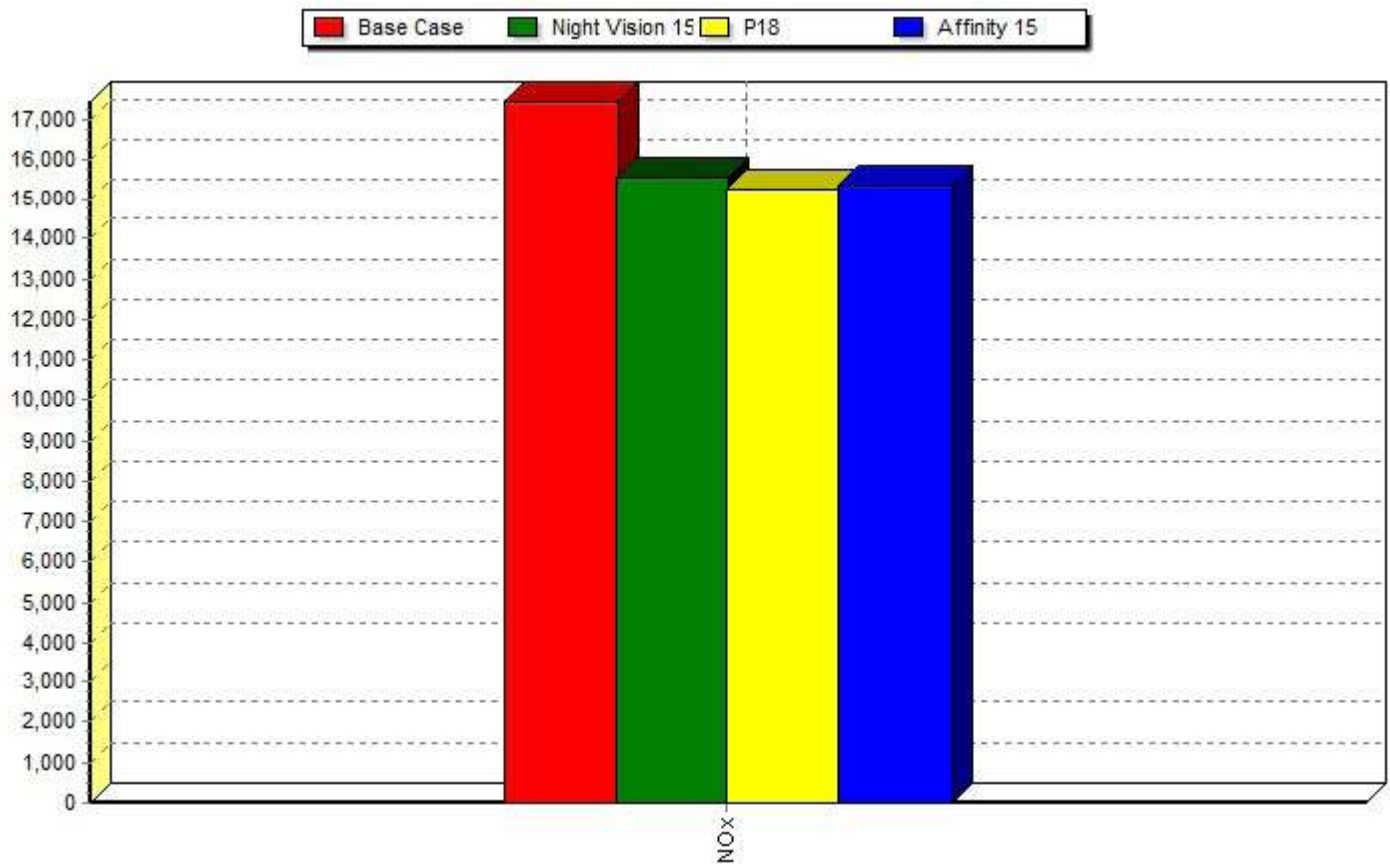
	Total
Base Case	1,867,882
Night Vision 15	1,663,077
Night Vision 15 - Savings	204,805
P18	1,631,930
P18 - Savings	235,952
Affinity 15	1,642,004
Affinity 15 - Savings	225,878

Annual CO2 [lb]



	CO2	Total
Base Case	10,845,259	10,845,259
Night Vision 15	9,741,642	9,741,642
Night Vision 15 - Savings	1,103,618	1,103,618
P18	9,561,748	9,561,748
P18 - Savings	1,283,512	1,283,512
Affinity 15	9,644,902	9,644,902
Affinity 15 - Savings	1,200,358	1,200,358

Annual NOx [lb]



	NOx	Total
Base Case	17,428	17,428
Night Vision 15	15,536	15,536
Night Vision 15 - Savings	1,892	1,892
P18	15,245	15,245
P18 - Savings	2,183	2,183
Affinity 15	15,345	15,345
Affinity 15 - Savings	2,083	2,083