

Report: Annual Building Utility Performance Summary

[Table of Contents](#)

For: Entire Facility

Timestamp: 2018-02-08 16:17:21

Values gathered over 168.00 hours

WARNING: THE REPORT DOES NOT REPRESENT A FULL ANNUAL SIMULATION.

Site and Source Energy

	Total Energy [kWh]	Energy Per Total Building Area [kWh/m2]	Energy Per Conditioned Building Area [kWh/m2]
Total Site Energy	2189.35	6.67	6.67
Net Site Energy	2189.35	6.67	6.67
Total Source Energy	3868.13	11.78	11.78
Net Source Energy	3868.13	11.78	11.78

Site to Source Energy Conversion Factors

	Site=>Source Conversion Factor
Electricity	3.167
Natural Gas	1.084
District Cooling	1.056
District Heating	3.613
Steam	0.250
Gasoline	1.050
Diesel	1.050
Coal	1.050
Fuel Oil #1	1.050
Fuel Oil #2	1.050
Propane	1.050
Other Fuel 1	1.000
Other Fuel 2	1.000

Building Area

	Area [m2]
Total Building Area	328.32
Net Conditioned Building Area	328.32
Unconditioned Building Area	0.00

End Uses

	Electricity [kWh]	Natural Gas [kWh]	Additional Fuel [kWh]	District Cooling [kWh]	District Heating [kWh]	Water [m3]
Heating	0.00	0.00	0.00	0.00	0.00	0.00
Cooling	0.00	0.00	0.00	1440.99	0.00	0.00
Interior Lighting	411.69	0.00	0.00	0.00	0.00	0.00
Exterior Lighting	2.00	0.00	0.00	0.00	0.00	0.00
Interior Equipment	292.07	16.66	0.00	0.00	0.00	0.00
Exterior Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Fans	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	0.00	0.00	0.00	0.00	0.00	0.00
Heat Rejection	0.00	0.00	0.00	0.00	0.00	0.00
Humidification	0.00	0.00	0.00	0.00	0.00	0.00
Heat Recovery	0.00	0.00	0.00	0.00	0.00	0.00
Water Systems	0.00	0.00	0.00	0.00	25.94	0.32
Refrigeration	0.00	0.00	0.00	0.00	0.00	0.00
Generators	0.00	0.00	0.00	0.00	0.00	0.00
Total End Uses	705.76	16.66	0.00	1440.99	25.94	0.32

End Uses By Subcategory

	Subcategory	Electricity [kWh]	Natural Gas [kWh]	Additional Fuel [kWh]	District Cooling [kWh]	District Heating [kWh]	Water [m3]
Heating	General	0.00	0.00	0.00	0.00	0.00	0.00
Cooling	General	0.00	0.00	0.00	1440.99	0.00	0.00
Interior Lighting	ELECTRIC EQUIPMENT#2085#GeneralLights	111.96	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2101#GeneralLights	41.45	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2117#GeneralLights	166.60	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2136#GeneralLights	43.13	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2143#GeneralLights	48.55	0.00	0.00	0.00	0.00	0.00
Exterior Lighting	EXTERIOR LIGHTING#1	2.00	0.00	0.00	0.00	0.00	0.00
Interior Equipment	ELECTRIC EQUIPMENT#2085#02	3.41	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2085#05	80.28	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2101#02	1.67	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2101#05	39.32	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2117#02	3.48	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2117#05	81.92	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2136#02	1.67	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2136#05	39.32	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2143#02	1.67	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2143#05	39.32	0.00	0.00	0.00	0.00	0.00
	GAS EQUIPMENT#2085#04	0.00	4.77	0.00	0.00	0.00	0.00
	GAS EQUIPMENT#2101#04	0.00	2.34	0.00	0.00	0.00	0.00
	GAS EQUIPMENT#2117#04	0.00	4.87	0.00	0.00	0.00	0.00
	GAS EQUIPMENT#2136#04	0.00	2.34	0.00	0.00	0.00	0.00
	GAS EQUIPMENT#2143#04	0.00	2.34	0.00	0.00	0.00	0.00
Exterior Equipment	General	0.00	0.00	0.00	0.00	0.00	0.00
Fans	General	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	General	0.00	0.00	0.00	0.00	0.00	0.00
Heat Rejection	General	0.00	0.00	0.00	0.00	0.00	0.00
Humidification	General	0.00	0.00	0.00	0.00	0.00	0.00
Heat Recovery	General	0.00	0.00	0.00	0.00	0.00	0.00
Water Systems	DHW 2085	0.00	0.00	0.00	0.00	7.43	0.09
	DHW 2101	0.00	0.00	0.00	0.00	3.64	0.04
	DHW 2117	0.00	0.00	0.00	0.00	7.58	0.09
	DHW 2136	0.00	0.00	0.00	0.00	3.64	0.04
	DHW 2143	0.00	0.00	0.00	0.00	3.64	0.04
Refrigeration	General	0.00	0.00	0.00	0.00	0.00	0.00
Generators	General	0.00	0.00	0.00	0.00	0.00	0.00

Normalized Metrics

Utility Use Per Conditioned Floor Area

	Electricity Intensity [kWh/m2]	Natural Gas Intensity [kWh/m2]	Additional Fuel Intensity [kWh/m2]	District Cooling Intensity [kWh/m2]	District Heating Intensity [kWh/m2]	Water Intensity [m3/m2]
Lighting	1.26	0.00	0.00	0.00	0.00	0.00
HVAC	0.00	0.00	0.00	4.39	0.08	0.00
Other	0.89	0.05	0.00	0.00	0.00	0.00
Total	2.15	0.05	0.00	4.39	0.08	0.00

Utility Use Per Total Floor Area

	Electricity Intensity [kWh/m2]	Natural Gas Intensity [kWh/m2]	Additional Fuel Intensity [kWh/m2]	District Cooling Intensity [kWh/m2]	District Heating Intensity [kWh/m2]	Water Intensity [m3/m2]
Lighting	1.26	0.00	0.00	0.00	0.00	0.00
HVAC	0.00	0.00	0.00	4.39	0.08	0.00
Other	0.89	0.05	0.00	0.00	0.00	0.00
Total	2.15	0.05	0.00	4.39	0.08	0.00

Electric Loads Satisfied

	Electricity [kWh]	Percent Electricity [%]
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Fuel-Fired Power Generation	0.000	0.00
High Temperature Geothermal*	0.000	0.00
Photovoltaic Power	0.000	0.00
Wind Power	0.000	0.00
Power Conversion	0.000	0.00
Net Decrease in On-Site Storage	0.000	0.00
Total On-Site Electric Sources	0.000	0.00
Electricity Coming From Utility	705.757	100.00
Surplus Electricity Going To Utility	0.000	0.00
Net Electricity From Utility	705.757	100.00
Total On-Site and Utility Electric Sources	705.757	100.00
Total Electricity End Uses	705.757	100.00

On-Site Thermal Sources

	Heat [kWh]	Percent Heat [%]
Water-Side Heat Recovery	0.00	
Air to Air Heat Recovery for Cooling	0.00	
Air to Air Heat Recovery for Heating	0.00	
High-Temperature Geothermal*	0.00	
Solar Water Thermal	0.00	
Solar Air Thermal	0.00	
Total On-Site Thermal Sources	0.00	

Water Source Summary

	Water [m3]	Percent Water [%]
Rainwater Collection	0.00	0.00
Condensate Collection	0.00	0.00
Groundwater Well	0.00	0.00
Total On Site Water Sources	0.00	0.00
-	-	-
Initial Storage	0.00	0.00
Final Storage	0.00	0.00
Change in Storage	0.00	0.00
-	-	-
Water Supplied by Utility	0.32	100.00
-	-	-
Total On Site, Change in Storage, and Utility Water Sources	0.32	100.00
Total Water End Uses	0.32	100.00

Setpoint Not Met Criteria

	Degrees [deltaC]
Tolerance for Zone Heating Setpoint Not Met Time	0.20
Tolerance for Zone Cooling Setpoint Not Met Time	0.20

Comfort and Setpoint Not Met Summary

	Facility [Hours]
Time Setpoint Not Met During Occupied Heating	0.00
Time Setpoint Not Met During Occupied Cooling	2.50
Time Not Comfortable Based on Simple ASHRAE 55-2004	2.50

Note 1: An asterisk (\*) indicates that the feature is not yet implemented.

Table of Contents

[Top](#)  
[Annual Building Utility Performance Summary](#)  
[Input Verification and Results Summary](#)  
[Demand End Use Components Summary](#)  
[Adaptive Comfort Summary](#)  
[Sensible Heat Gain Summary](#)

Timestamp: 2018-02-08 16:17:21

General

	Value
Program Version and Build	EnergyPlus, Version 8.5.0-c87e61b44b, YMD=2018.02.08 16:17
RunPeriod	UNTITLED (17-08:23-08)
Weather File	Tehran Mehrabad - IRN ITMY WMO#=407540
Latitude [deg]	35.41
Longitude [deg]	51.19
Elevation [m]	1190.00
Time Zone	3.00
North Axis Angle [deg]	0.00
Rotation for Appendix G [deg]	0.00
Hours Simulated [hrs]	168.00

ENVELOPE

Window-Wall Ratio

	Total	North (315 to 45 deg)	East (45 to 135 deg)	South (135 to 225 deg)	West (225 to 315 deg)
Gross Wall Area [m2]	380.79	127.99	97.60	57.60	97.60
Above Ground Wall Area [m2]	380.79	127.99	97.60	57.60	97.60
Window Opening Area [m2]	90.09	17.28	27.77	17.28	27.77
Gross Window-Wall Ratio [%]	23.66	13.50	28.45	30.00	28.45
Above Ground Window-Wall Ratio [%]	23.66	13.50	28.45	30.00	28.45

Conditioned Window-Wall Ratio

	Total	North (315 to 45 deg)	East (45 to 135 deg)	South (135 to 225 deg)	West (225 to 315 deg)
Gross Wall Area [m2]	380.79	127.99	97.60	57.60	97.60
Above Ground Wall Area [m2]	380.79	127.99	97.60	57.60	97.60
Window Opening Area [m2]	90.09	17.28	27.77	17.28	27.77
Gross Window-Wall Ratio [%]	23.66	13.50	28.45	30.00	28.45
Above Ground Window-Wall Ratio [%]	23.66	13.50	28.45	30.00	28.45

Skylight-Roof Ratio

	Total
Gross Roof Area [m2]	181.84
Skylight Area [m2]	0.00
Skylight-Roof Ratio [%]	0.00

PERFORMANCE

Zone Summary

	Area [m2]	Conditioned (Y/N)	Part of Total Floor Area (Y/N)	Volume [m3]	Multipliers	Gross Wall Area [m2]	Window Glass Area [m2]	Lighting [W/m2]	People [m2 per person]	Plug and Process [W/m2]
2085	94.08	Yes	Yes	282.24	1.00	101.84	24.54	25.0000	9.01	12.9700
2101	46.08	Yes	Yes	138.24	1.00	73.76	16.02	25.0000	9.01	12.9700
2117	96.00	Yes	Yes	240.00	1.00	62.06	11.10	25.0000	9.01	12.9700
2136	46.08	Yes	Yes	138.24	1.00	72.04	16.02	25.0000	9.01	12.9700
2143	46.08	Yes	Yes	138.24	1.00	71.10	16.02	25.0000	9.01	12.9700
Total	328.32			936.96		380.79	83.69	25.0000	9.01	12.9700
Conditioned Total	328.32			936.96		380.79	83.69	25.0000	9.01	12.9700
Unconditioned Total	0.00			0.00		0.00	0.00			
Not Part of Total	0.00			0.00		0.00	0.00			

Report: Demand End Use Components Summary

Table of Contents

For: Entire Facility

Timestamp: 2018-02-08 16:17:21

End Uses

	Electricity [W]	Natural Gas [W]	Propane [W]	District Cooling [W]	District Heating [W]	Water [m3/s]
Time of Peak	19-AUG-18:30	19-AUG-07:30	-	19-AUG-15:00	19-AUG-07:30	19-AUG-07:30
Heating	0.00	0.00	0.00	0.00	0.00	0.00

Cooling	0.00	0.00	0.00	20353.63	0.00	0.00
Interior Lighting	8208.00	0.00	0.00	0.00	0.00	0.00
Exterior Lighting	100.00	0.00	0.00	0.00	0.00	0.00
Interior Equipment	4028.49	229.82	0.00	0.00	0.00	0.00
Exterior Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Fans	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	0.00	0.00	0.00	0.00	0.00	0.00
Heat Rejection	0.00	0.00	0.00	0.00	0.00	0.00
Humidification	0.00	0.00	0.00	0.00	0.00	0.00
Heat Recovery	0.00	0.00	0.00	0.00	0.00	0.00
Water Systems	0.00	0.00	0.00	0.00	357.79	0.00
Refrigeration	0.00	0.00	0.00	0.00	0.00	0.00
Generators	0.00	0.00	0.00	0.00	0.00	0.00
Total End Uses	12336.49	229.82	0.00	20353.63	357.79	0.00

End Uses By Subcategory

	Subcategory	Electricity [W]	Natural Gas [W]	Propane [W]	District Cooling [W]	District Heating [W]	Water [m3/s]
Heating	General	0.00	0.00	0.00	0.00	0.00	0.00
Cooling	General	0.00	0.00	0.00	20353.63	0.00	0.00
Interior Lighting	ELECTRIC EQUIPMENT#2085#GeneralLights	2352.00	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2101#GeneralLights	1152.00	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2117#GeneralLights	2400.00	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2136#GeneralLights	1152.00	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2143#GeneralLights	1152.00	0.00	0.00	0.00	0.00	0.00
Exterior Lighting	EXTERIOR LIGHTING#1	100.00	0.00	0.00	0.00	0.00	0.00
Interior Equipment	ELECTRIC EQUIPMENT#2085#02	47.04	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2085#05	1107.32	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2101#02	23.04	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2101#05	542.36	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2117#02	48.00	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2117#05	1129.92	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2136#02	23.04	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2136#05	542.36	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2143#02	23.04	0.00	0.00	0.00	0.00	0.00
	ELECTRIC EQUIPMENT#2143#05	542.36	0.00	0.00	0.00	0.00	0.00
	GAS EQUIPMENT#2085#04	0.00	65.86	0.00	0.00	0.00	0.00
	GAS EQUIPMENT#2101#04	0.00	32.26	0.00	0.00	0.00	0.00
	GAS EQUIPMENT#2117#04	0.00	67.20	0.00	0.00	0.00	0.00
	GAS EQUIPMENT#2136#04	0.00	32.26	0.00	0.00	0.00	0.00
	GAS EQUIPMENT#2143#04	0.00	32.26	0.00	0.00	0.00	0.00
Exterior Equipment	General	0.00	0.00	0.00	0.00	0.00	0.00
Fans	General	0.00	0.00	0.00	0.00	0.00	0.00
Pumps	General	0.00	0.00	0.00	0.00	0.00	0.00
Heat Rejection	General	0.00	0.00	0.00	0.00	0.00	0.00
Humidification	General	0.00	0.00	0.00	0.00	0.00	0.00
Heat Recovery	General	0.00	0.00	0.00	0.00	0.00	0.00
Water Systems	DHW 2085	0.00	0.00	0.00	0.00	102.52	0.00
	DHW 2101	0.00	0.00	0.00	0.00	50.22	0.00
	DHW 2117	0.00	0.00	0.00	0.00	104.62	0.00
	DHW 2136	0.00	0.00	0.00	0.00	50.22	0.00
	DHW 2143	0.00	0.00	0.00	0.00	50.22	0.00
Refrigeration	General	0.00	0.00	0.00	0.00	0.00	0.00
Generators	General	0.00	0.00	0.00	0.00	0.00	0.00

	HVAC Zone Eq & Other Sensible	HVAC Zone Eq & Other Sensible	HVAC Terminal Unit Sensible	HVAC Terminal Unit Sensible	HVAC Input Heated Surface	HVAC Input Cooled Surface	People Sensible Heat	Lights Sensible Heat	Equipment Sensible Heat	Window Heat Addition [GJ]	Interzone Air Transfer Heat	Infiltration Heat Addition [GJ]	Opaque Surface Conduction and Other	Equipment Sensible Heat	Window Heat Removal [GJ]	Interzone Air Transfer Heat
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	Air Heating [GJ]	Air Cooling [GJ]	Air Heating [GJ]	Air Cooling [GJ]	Heating [GJ]	Cooling [GJ]	Addition [GJ]	Addition [GJ]	Addition [GJ]		Addition [GJ]		Heat Addition [GJ]	Removal [GJ]		Removal [GJ]
2085	0.000	-1.326	0.000	0.000	0.000	0.000	0.185	0.403	0.304	0.306	0.000	0.040	0.104	0.000	-0.010	-0.002
2101	0.000	-0.824	0.000	0.000	0.000	0.000	0.091	0.149	0.149	0.184	0.000	0.025	0.236	0.000	-0.006	-0.000
2117	0.000	-1.513	0.000	0.000	0.000	0.000	0.189	0.600	0.310	0.144	0.000	0.062	0.213	0.000	-0.004	-0.000
2136	0.000	-0.672	0.000	0.000	0.000	0.000	0.091	0.155	0.149	0.196	0.000	0.042	0.049	0.000	-0.004	-0.000
2143	0.000	-0.668	0.000	0.000	0.000	0.000	0.091	0.175	0.149	0.197	0.000	0.040	0.026	0.000	-0.004	-0.000
Total Facility	0.000	-5.003	0.000	0.000	0.000	0.000	0.646	1.482	1.060	1.025	0.001	0.209	0.628	0.000	-0.029	-0.002

## Peak Cooling Sensible Heat Gain Components

	Time of Peak {TIMESTAMP}	HVAC Zone Eq & Other Sensible Air Heating [W]	HVAC Zone Eq & Other Sensible Air Cooling [W]	HVAC Terminal Unit Sensible Air Heating [W]	HVAC Terminal Unit Sensible Air Cooling [W]	HVAC Input Heated Surface Heating [W]	HVAC Input Cooled Surface Cooling [W]	People Sensible Heat Addition [W]	Lights Sensible Heat Addition [W]	Equipment Sensible Heat Addition [W]	Window Heat Addition [W]	Interzone Air Transfer Heat Addition [W]	Infiltration Heat Addition [W]	Opaque Surface Conduction and Other Heat Addition [W]	Equipment Sensible Heat Removal [W]	Wind H Remc
2085	19-AUG-07:04	0.00	-9292.85	0.00	0.00	0.00	0.00	507.97	1608.43	1163.77	523.40	104.72	0.00	6216.11	0.00	-
2101	22-AUG-07:04	0.00	-4502.15	0.00	0.00	0.00	0.00	250.49	594.28	570.01	349.77	0.00	103.93	2633.68	0.00	-
2117	19-AUG-07:04	0.00	-8846.26	0.00	0.00	0.00	0.00	518.34	2309.80	1187.52	249.43	140.72	0.00	4740.36	0.00	-
2136	19-AUG-07:04	0.00	-4248.80	0.00	0.00	0.00	0.00	264.87	623.91	570.01	329.80	73.16	0.00	2786.78	0.00	-
2143	19-AUG-07:04	0.00	-4213.98	0.00	0.00	0.00	0.00	262.13	704.08	570.01	334.09	0.00	0.00	2818.33	0.00	-
Total Facility	19-AUG-07:04	0.00	-31088.02	0.00	0.00	0.00	0.00	1808.09	5831.93	4061.32	1765.94	396.16	0.00	19649.44	0.00	-

## Peak Heating Sensible Heat Gain Components

	Time of Peak {TIMESTAMP}	HVAC Zone Eq & Other Sensible Air Heating [W]	HVAC Zone Eq & Other Sensible Air Cooling [W]	HVAC Terminal Unit Sensible Air Heating [W]	HVAC Terminal Unit Sensible Air Cooling [W]	HVAC Input Heated Surface Heating [W]	HVAC Input Cooled Surface Cooling [W]	People Sensible Heat Addition [W]	Lights Sensible Heat Addition [W]	Equipment Sensible Heat Addition [W]	Window Heat Addition [W]	Interzone Air Transfer Heat Addition [W]	Infiltration Heat Addition [W]	Opaque Surface Conduction and Other Heat Addition [W]	Equipment Sensible Heat Removal [W]	Wind H Remc
2085	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(
2101	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(
2117	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(
2136	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(
2143	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(
Total Facility	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(

Report: Adaptive Comfort Summary

[Table of Contents](#)

For: Entire Facility

Timestamp: 2018-02-08 16:17:21

Time Not Meeting the Adaptive Comfort Models during Occupied Hours

	ASHRAE55 90% Acceptability Limits [Hours]	ASHRAE55 80% Acceptability Limits [Hours]	CEN15251 Category I Acceptability Limits [Hours]	CEN15251 Category II Acceptability Limits [Hours]	CEN15251 Category III Acceptability Limits [Hours]
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