



ST. JOHN'S
UNIVERSITY

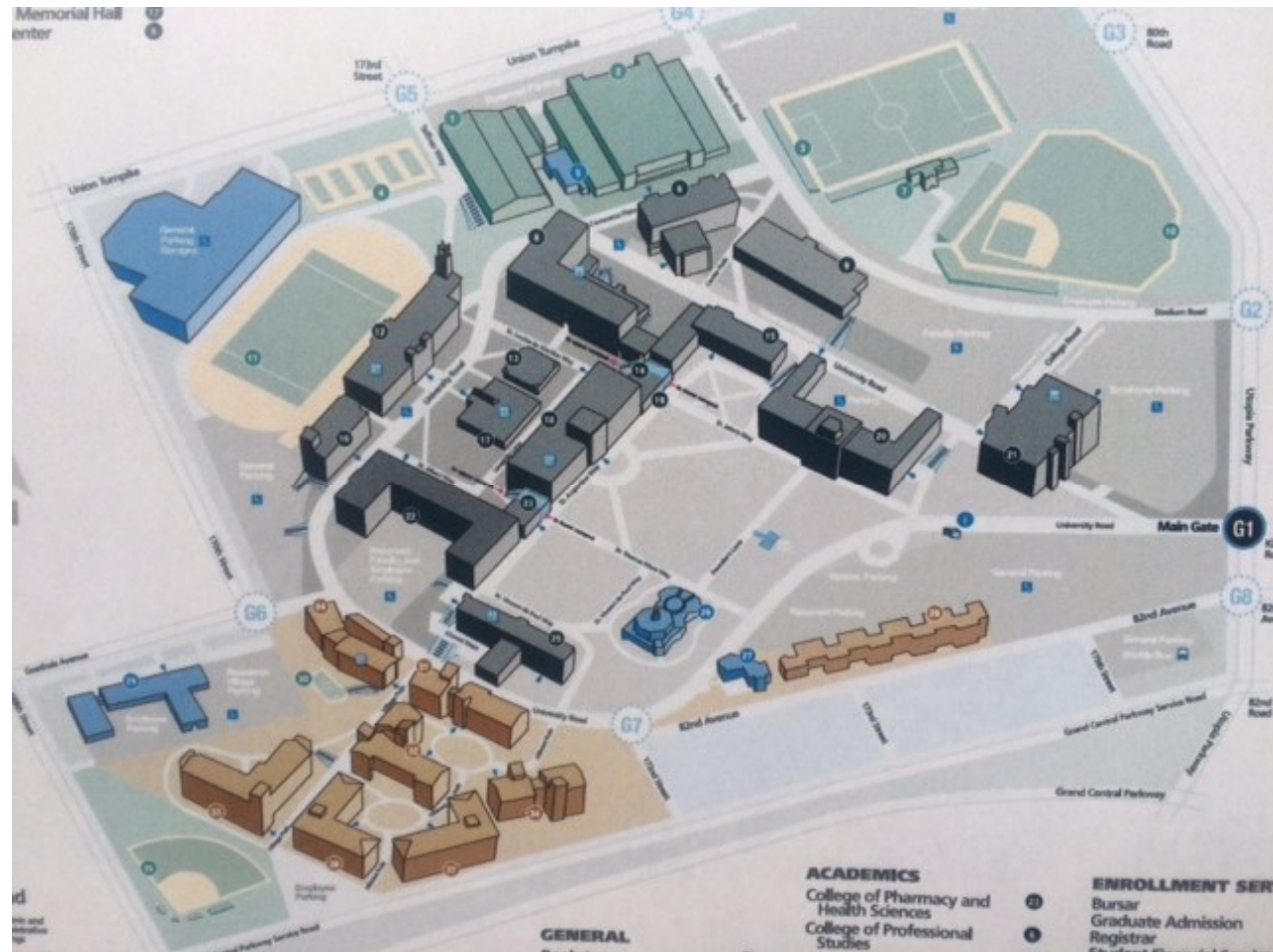
Northeast Sustainable Energy Association

Building Energy NYC

November 3, 2016

ST. JOHN'S UNIVERSITY QUEENS CAMPUS

105 acres
26 buildings
2.3 million sf
3 boiler plants
2300 residents



Energy Efficiency Within SJU's Sustainability Program

Strategy for SJU

- Utility Tracking, Energy Dashboards & Benchmarking
 - Metering, data collection & analysis
 - Operation awareness, training & teambuilding
- Condition Assessment, Energy Audit & Budgeting
 - Infrastructure renewal / replacement & enhancements
 - Investment-grade audit / technical studies, & prioritizing
 - Budget development, approvals, implementation & reporting
- Re-commissioning, Re-tuning & Continuous Monitoring
 - Mechanical systems trend log data, analysis & efficient operation

Example of Condition Assessment (classroom buildings)

Facilities Condition Assessment Report Classroom Buildings						Spending by Category		
Total Recommended Spending by Category								
Building	*FCR Rating	Building Envelope	HVAC Cooling	HVAC Heating	Infrastructure	Grounds	Interiors	Total
D'Angelo Center	2.1%	\$491,769	\$447,494	\$12,650	\$225,170	\$687,369	\$273,668	\$2,138,119
The Law School	8.2%	\$3,234,763	\$2,535,060	\$1,201,459	\$1,487,008	\$297,275	\$3,658,581	\$12,414,146
St. Augustine Hall	10.7%	\$2,722,122	\$1,642,286	\$2,751,375	\$2,108,123	\$949,224	\$2,613,154	\$12,786,284
Sullivan Hall	13.8%	\$576,081	\$1,696,239	\$610,995	\$615,359	\$181,844	\$4,366,841	\$8,047,358
Bartilucci Center	15.4%	\$918,311	\$1,074,425	\$661,911	\$173,495	\$504,798	\$1,789,060	\$5,122,000
St. John Hall	15.7%	\$3,112,374	\$764,882	\$6,192,175	\$1,035,352	\$53,446	\$4,614,821	\$15,773,050
St. Albert Hall	22.0%	\$4,921,310	\$4,278,420	\$8,195,998	\$7,247,647	\$198,282	\$7,873,858	\$32,715,515
Marillac Hall	22.5%	\$5,785,066	\$3,282,043	\$264,385	\$7,793,361	\$1,072,088	\$5,552,742	\$23,749,684
Bent Hall	25.9%	\$1,675,651	\$3,128,440	\$1,834,440	\$4,215,815	\$209,168	\$5,214,485	\$16,277,998
Totals:		\$23,437,446	\$18,849,288	\$21,725,388	\$24,901,329	\$4,153,495	\$35,957,209	\$129,024,155
Percentage of Overall Total:		18.17%	14.61%	16.84%	19.30%	3.22%	27.87%	100.00%

FCR Facilities Condition Rating is renewal / current replacement value

NYC CARBON CHALLENGE

Energy Use in Base Year and Submission Year

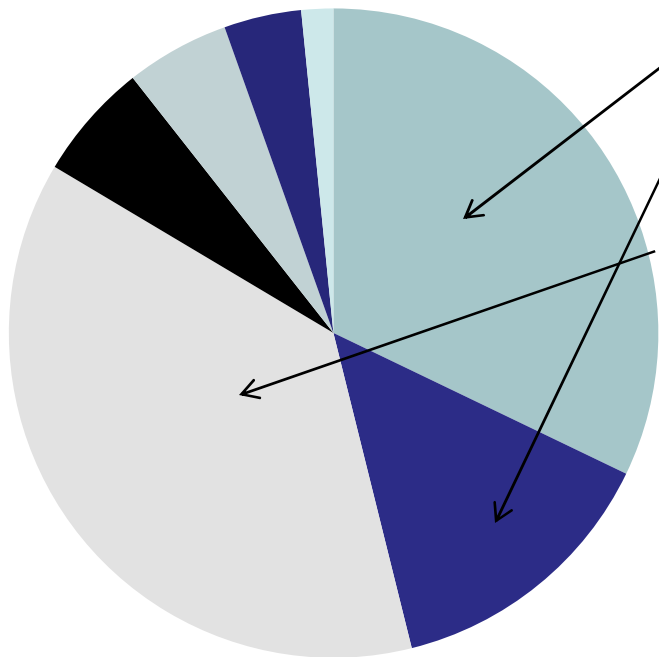
	2007	2015	Change
Total Energy Use (MMBtu)	785,908	679,878	-13.49%
Square Feet	2,593,131	3,027,077	16.73%
Energy Use Intensity (MMbtu/SF)	303.07	224.60	-25.89%

Emissions in Base Year and Submission Year

	2007	2015	Change
Total Emissions (Mg CO2e)	41,026	32,435	-20.94%
Square Feet	2,593,131	3,027,077	16.73%
Carbon Intensity (lbs CO2e/SF)	34.88	23.62	-32.28%

Energy Efficiency Project Summary \$21 million

Carbon Reduction Chart



To date: 8,000 tons carbon reduction from energy efficiency projects

Project Category Summary

	Project Cost	Annual Save	Simple Pay Back
32% from High Efficiency Chilled Water Plants 2,611 tons	\$9M	\$620K	15 yrs.
14% from Building HVAC Controls 1,137 tons	\$1.7M	\$353K	5 yrs.
37% from Lighting Projects 3,041 tons	\$2.3M	\$955K	2.4 yrs.
6% from High Efficiency Chemical Fume Hood Conversions 475 tons	\$886K	\$155K	5.5 yrs.
5% from Steam Traps & Pipe Insulation 420 tons	\$420K	\$94K	4.5 yrs.
4% from HVAC Ventilation Modifications 312 tons	\$250K	\$97K	2.6 yrs.
1% from Domestic Water Reduction 130 tons	\$15K	\$85K	<1 yr.
FY15/16 Electric Service Consolidation	\$6M	\$300K	20 yrs.
Total	\$21M	\$2.6M	8.0 yrs.

Energy Efficiency Projects & Benefits

	Infrastructure Renewal / Replacement & Enhancements	Project Benefits & Student Experience
1	<p>High efficiency chilled water generating plants Investment \$9 million</p> <p>Elimination of steam absorption water chillers Installation of primary / secondary pumping</p>	<p>Provides reliable, energy efficient chilled water for air conditioning at a lower cost and reduced carbon emissions</p> <p>Allows seasonal shut down of heating plant</p>
2	<p>Expansion of electrical substation Investment \$6 million</p> <p>Elimination of five overhead electrical power utility services</p>	<p>Provides reliable electrical service at a lower cost</p> <p>Facilitates possible future distributed generation</p>
3	<p>Lighting, Controls, Pipe Insulation & Ventilation Investment \$6 million</p> <p>2016 Campus-wide LED Lighting Upgrade</p>	<p>Short payback, improvements efficiency and space comfort</p> <p>Lowers operating cost and carbon emissions</p>

List of Energy Efficiency Projects Completed

Project Description	Building	Project Cost	Annual Savings Model				
			Carbon Reduced CO2 (Mtons)	Electricity (KWH)	Natural Gas (Therms)	Dollars	
High Efficiency Chilled Water Plant	D'Angelo Center	\$1,933,712	605	285,000	91,041	\$ 155,878	
	St Augustine Hall	\$2,662,816	666		125,368	\$ 147,934	
	Newman Hall	\$1,046,106	262		49,252	\$ 58,117	
	St Albert Hall	\$697,404	175		32,834	\$ 38,744	
St. John Hall Air Conditioning	St John Hall	\$2,810,000	903	250,000	150,000	\$ 219,500	
Building Controls (BMS)	Bent Hall	\$125,076	44	105,106		\$ 17,868	
	Carnesecca	\$249,551	53	125,673		\$ 21,364	
	St John Hall	\$151,771	161	379,639		\$ 64,539	
	St Augustine	\$131,983	47	110,910		\$ 18,855	
	St Albert Hall	\$316,898	113	266,301		\$ 45,271	
	Marillac Hall	\$131,054	11	26,096		\$ 4,436	
	Law School	\$181,650	29	68,613		\$ 11,664	
	University Center	\$127,660	45	107,277		\$ 18,237	
	Residence Halls	\$152,168	54	127,872		\$ 21,738	
	Boiler Controls	\$177,000	580		109,124	\$ 128,766	
	Lighting Projects	Newman Hall	\$68,000	38	88,852		\$ 15,105
		St Albert Hall	\$138,144	120	283,318		\$ 48,164
		Bent Hall	\$81,997	64	151,395		\$ 25,737
		Marillac Hall	\$129,873	76	179,392		\$ 30,497
Sullivan Hall		\$69,729	74	175,830		\$ 29,891	
Residence Halls		\$136,978	39	91,947		\$ 15,631	
St John Hall		\$53,399	26	61,235		\$ 10,410	
SunYet Sun		\$9,817	20	46,256		\$ 7,864	
St Augustine Hall		\$47,063	61	143,815		\$ 24,449	
Carnesecca		\$57,365	86	202,488		\$ 34,423	
Chiang		\$9,132	3	7,689		\$ 1,307	
ROTC		\$40,751	32	76,384		\$ 12,985	
Law School		\$126,541	130	306,326		\$ 52,075	
University Center		\$21,470	21	48,975		\$ 8,326	
Site Lighting	\$487,286	287	679,128		\$ 115,452		
Residential Village	\$88,225	56	131,551		\$ 22,364		

Project Description	Building	Project Cost	Annual Savings Model			
			Carbon Reduced CO2 (Mtons)	Electricity (KWH)	Natural Gas (Therms)	Dollars
Steam Traps & Insulation	St Albert Hall	\$158,171	110		20,622	\$ 24,334
	Bent Hall	\$27,352	19		3,566	\$ 4,208
	Sullivan Hall	\$6,628	5		864	\$ 1,020
	Residence Halls	\$36,820	26		4,801	\$ 5,665
	Carnesecca	\$61,012	41		7,682	\$ 9,065
Pipe Insulation	vairous	\$129,800	220		41,409	\$ 48,863
Water Projects Gallon Reduction	5,610,050	\$15,000	130		24,491	\$ 85,000
Fume Hood Conversion Kits (79)	St Albert Hall	\$885,788	475	654,588	37,240	\$ 155,223
Kitchen Exhaust	Marillac Hall	\$44,800	31	38,726	2,800	\$ 9,887
Teaching Labs Ventilation Control	St Albert Hall	\$205,195	280	329,967	26,507	\$ 87,373
Electrical Service Consolidation	Campus-wide	\$6,000,000	0			\$ 300,000
Campus-wide LED Lighting Upgrade	26 buildings	\$700,000	1,909	4,000,000	40,946	\$ 500,000
Totals		\$20,700,000	8,067	5,550,349	727,601	\$ 2,658,230

Projects funded by

- Traditional on-balance sheet DASNY TELP
- NYSERDA, ARRA of 2009 & Con Ed Incentives

NYSERDA & ARRA Funds	Year	Funded Amount
High Efficiency Chiller	2010	\$ 280,000
Lighting	2009-2011	\$ 350,000
ARRA Of 2009 Phase II Projects	2011	\$ 980,000
Con Edison Demand Management	2016	\$ 700,000
Subtotal To Date		\$ 3,310,000



Thank you

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