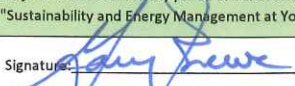


York University Ontario Green Energy Act Regulation 397/11 2014 Energy Conservation and Demand Management Plan							Section Ref.
2012 Total Annual Building energy consumption for specified activities: 238.7 million ekWh							6.(1) (c) (i)
Energy Conservation and Demand Management Plan - Goals & Objectives							6.(1) (c) (ii)
1	Reinforce and further enhance York University's reputation as a sustainability leader in North America						6.(1) (c) (ii)
2	Increase accountability with the implementation of a pan University initiative of user based budget re-allocation to align expenses with revenue streams to improve and reinforce a culture of conservation						6.(1) (c) (ii)
3	Develop an Energy Master Plan that addresses, through smart energy approaches, climate change challenges of extreme weather, resilience, and energy security in a planning context of high density land development, enhanced district energy opportunities, budgetary constraints and deferred maintenance costs						6.(1) (c) (ii)
4	To create additional infrastructure capacity through further conservation and efficiency for sustainable growth to offset building footprint increases						6.(1) (c) (ii)
5	To offset increases of rising utility costs predicted in the 2013 Ontario Long Term Energy Plan						6.(1) (c) (ii)
6	Work with the Ministry of Energy and related agencies to encourage the implementation of economical development of renewable energy and storage solutions for campuses (eg. net metering, peak shifting through chilled water storage)						6.(1) (c) (ii)
7	Leverage energy assets for teaching, research, and knowledge mobilization						6.(1) (c) (ii)
8	Reduce energy and water consumption through opportunities such as the \$70,000,000 housing renovation project						6.(1) (c) (ii)
9	IT Initiatives - continue to; expand use of Power Management software for night shutdown of lab based computers, consolidate printers, virtualize servers						6.(1) (c) (ii)
10	Promote the President's Sustainability Council Operations Working Group 2014 recommendation to make all new buildings solar roof top ready						6.(1) (c) (ii)
11	Minimize consumption and demand with green design support for the new 2nd Student Centre						6.(1) (c) (ii)
12	Continue to monitor fast evolving LED options to replace Metal Halide and High Pressure Sodium lamps for possible large scale project for Parking Facilities						6.(1) (c) (ii)
13	Continue to monitor fast evolving LED options to replace T8 fluorescent lamps for possible large scale project						6.(1) (c) (ii)
14	Continue to build on success of engagement activities (e.g. Res Race to Zero, Usage Info to LCD Screens, President's Sustainability Council award program)						6.(1) (c) (ii)
York University 2014 Summary Table of Energy Conservation and Demand Management Plan Measures							6.(1) (c) (iii, iv, vii)
	Energy	Demand	Estimated Cost (\$)	Estimated Savings/Yr (\$)	Estimated Duration (Years)	Measure Description (red. = Reduction per year)	6.(1) (c) (iii, iv, vii)
1	✓	✓	\$ 200,000	TBD	TBD	Energy Master Plan - Given that York University was already implementing a very large and successful \$41.5 million dollar Energy and Demand Management project, along with various HVAC and lighting scheduling improvements, the challenge is now to complete a thoughtful energy master plan that reviews our aging assets and the reliability upgrade needs of our infrastructure for the 50+ year old campuses, while looking ahead to new technology and land development opportunities. This exercise will need to deal with the current uncertainty of greenhouse gas regulations, future incentive regimes, and new Regional Energy Planning directives. This activity is starting with four (4) detailed engineering feasibility studies.	6.(1) (c) (iii, iv, vii)
2		✓	\$ 50,000	TBD	N/A	Detailed Engineering Feasibility Study (OPA PSUI) - Glendon Cogen	6.(1) (c) (iii, iv, vii)
3		✓	\$ 50,000	TBD	N/A	Detailed Engineering Feasibility Study (OPA PSUI) - Keele Cogen Upgrades	6.(1) (c) (iii, iv, vii)
4		✓	\$ 50,000	TBD	N/A	Detailed Engineering Feasibility Study (OPA PSUI) - Keele Cogen Utilization	6.(1) (c) (iii, iv, vii)
5		✓	\$ 50,000	TBD	N/A	Detailed Engineering Feasibility Study (OPA PSUI) - Keele Tri-Generation Optimization	6.(1) (c) (iii, iv, vii)
6	✓	✓	\$ 5,000,000	\$ 523,101	30	Tri-generation Optimization - 3,000 ton Steam Turbine Chiller (5,231,000 kWh & 2,000 kW red.)	6.(1) (c) (iii, iv, vii)
7	✓	✓	\$ 1,000,000	\$ 142,857	10	Replacement of Keele Central Plant Air Compressors/Dryer (60 kW, 171,885 kWh red.)	6.(1) (c) (iii, iv, vii)
8	✓	✓	\$ 1,100,000	\$ 104,330	30	Glendon - York Hall HVAC and Water Reduction Upgrades (water red. 4,500 m ³ , 500,000 kWh)	6.(1) (c) (iii, iv, vii)
9	✓	✓	\$ 625,000	\$ 104,167	30	Chilled Water Upgrades phase IV 2014 (500kW red. includes Housing portion below)	6.(1) (c) (iii, iv, vii)
10	✓	✓	\$ 680,568	\$ 84,733	30	Lighting Upgrades - Housing Residences Project (both campuses, 846,334 kWh red.)	6.(1) (c) (iii, iv, vii)
11	✓	✓	\$ 1,300,000	\$ 63,000	30	Window Upgrades - Housing Residences Project (Glendon Hilliard 2014, Winters 2017)	6.(1) (c) (iii, iv, vii)
12	✓	✓	\$ 300,000	\$ 16,800	30	Washroom Upgrades - Housing Residences Project (estimate of 3% of \$10,000,000 5 yr budget)	6.(1) (c) (iii, iv, vii)
13	✓	✓	\$ 16,000	\$ 2,000	30	Regenerative Elevator Upgrades - Housing Residences Project (Bethune & Tatham Hall)	6.(1) (c) (iii, iv, vii)
14	✓	✓	\$ 172,000	\$ 28,667	30	Chilled Water Upgrades - Housing Residences Project non academic portion of phase IV	6.(1) (c) (iii, iv, vii)
15	✓	✓	\$ 149,641	\$ 26,304	30	Lighting Upgrades - Interior High Ceiling, LEDs & Elevators (LED 50,000 kWh, 50 kW reduction)	6.(1) (c) (iii, iv, vii)
16	✓		\$ 200,000	\$ 16,000	30	Lighting Upgrades - Exterior LEDs (CSBO Maintenance Project)	6.(1) (c) (iii, iv, vii)
17	✓	✓	\$ 102,306	\$ 30,417	30	Student Centre Upgrades - (Lighting 47.6 kW, 233,974 kWh, HVAC, plus colonnade daylight harvesting)	6.(1) (c) (iii, iv, vii)
18	✓	✓	TBD	TBD	30	Lighting Upgrades - Colonnade Daylight Harvesting (red. 160,000 kWh) and Controls Pilot with LDC	6.(1) (c) (iii, iv, vii)
19	✓	✓	\$ 15,000	TBD	10	Building Automation System (BAS) Demand Response (DR) Upgrades - peak shaving	6.(1) (c) (iii, iv, vii)
20	✓	✓	TBD	TBD	10	Investigate (Registrar Dbase) R25 Upgrade & BAS integration for improved scheduling and space management	6.(1) (c) (iii, iv, vii)
21	✓		\$ 20,000	\$ 30,000	30	Miscellaneous Building Automation and HVAC Upgrades (fan coil automation in SSB, & TEL, red. 300,000 kWh/yr)	6.(1) (c) (iii, iv, vii)
22	✓	✓	\$ 20,000	\$ 8,600	30	Convert HVAC roll filters to low static pressure drop box filters to reduce fan power consumption (Zone 1, DAFCO, 9 locations, red. 111,850 kWh)	6.(1) (c) (iii, iv, vii)
23	✓	✓	\$ 300,000	\$ 50,000	30	Lumbers Laboratory scheduling and/or occupancy demand based HVAC to reduce Air Changes per Hour of energy intensive 100% fresh air make up, explore possible wider spread implementation (reduction 206, 240 kWh/yr, 20 kW before indirect impact of chiller reduction)	6.(1) (c) (iii, iv, vii)
Total Estimates*			\$ 11,400,515	\$ 1,230,975		*Savings are dependent on future utility rates	6.(1) (c) (iii, iv, vii)
York University 2014 Energy Conservation and Demand Management Plan - Other Information							
The New Lassonde School of Engineering Building is under construction and we have electrically and structurally protected for a Photovoltaic Solar Array of approximately 35kW. Implementation will depend on the business case as the Ontario Feed-In-Tariff program is not conducive to large campus configurations.							6.(1) (c) (v)
York University does not operate any ground source heat pump technology at this time due to lack of economic viability.							6.(1) (c) (vi) (A)
York University does not operate any active thermal harness technology at this time due to lack of economic viability. Numerous passive systems.							6.(1) (c) (vi) (B)
York University will to continue operate existing heat pump technology systems (York Lanes retail and construction trailers) where no practical and more economical option exists. We are investigating and evaluating the feasibility of utilizing thermal heat pump technology between the Sherman Health Sciences facility and the adjacent Canlan Ice Sports six (6) pad.							6.(1) (c) (vi) (C)
York University is nearing completion of a \$41,646,000 Energy Management Project. We are extremely proud of our sector leading early action energy reduction accomplishments as highlighted in the separate powerpoint document titled "Sustainability and Energy Management at York University"							6.(4)
Approved by: Gary Brewer, Vice- President Finance and Administration Signature:  Date: <u>June 16</u> , 2014							6.(1) (c) (viii)