KPU

2015 CARBON NEUTRAL ACTION REPORT

Prepared by Facilities Services

May 2016

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EXECUTIVE SUMMARY

Kwantlen Polytechnic University (KPU) evolved from what began in 1981 as Kwantlen College. Since inception KPU has endeavored to be a dynamic and inspirational leader in creating a more sustainable world. Through implementation of sustainable energy conservation practices, business practices, educational offerings, community events, and research, KPU has engaged stakeholders in addressing environmental sustainability. By sponsoring and supporting sustainability events and activities, KPU upholds its commitment to creating a more sustainable world, particularly by reducing Greenhouse Gas Emissions (GHG) for the University.

In support of the Provincial Bill 44 targets to reduce Green House Gas Emissions KPU has achieved a 21% reduction in GHG emissions from 2009 to 2015 and anticipate exceeding the provincial 18% reduction target set for 2016. This past year, KPU reduced its GNG emissions by 7.7% from 2014. KPU aims to meet provincially legislated targets by targeting a yearly emissions reduction of 5.5%.

From a global perspective, KPU recognizes that organizations need to greatly reduce their impact on the natural environment. KPU's Mission and Vision,(Vision 2018) outlines "opportunities to achieve success in a diverse range of programs that blend theory, practice, critical understanding, and social and ethical awareness necessary for good citizen ship and rewarding careers." Vision 2018 further outlines the values of "responsible stewardship of resources" with specific goals of "integrating sustainability into core curriculum" and "continuing to enhance sustainability efforts on campus". To that end, along with the numerous curricular offerings, KPU strives for efficient and sustainable outcomes in all its service delivery. Examples include; green procurement practices and product selections such as enhanced recycled paper content; a comprehensive waste management program; technological solutions for meeting rooms and office PC's (the addition of cameras) to reduce the need for travel between campuses; promoting alternative transportation such as an intercampus shuttle, bike lockers, bike repair stations, and showers.

KPU strives to reduce consumption of water, electricity and natural gas so that KPU is a leader to others in our sector and the community. Energy Conservation is a core consideration when completing new expansions, renovating buildings, and daily operations. This has led Kwantlen to consistently focus on reducing.

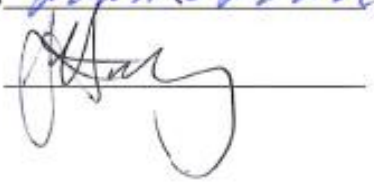
From 1994 to 2015 KPU has increased in space by 36.56% while decreasing our natural gas consumption by 14.13% and electricity consumption by 9.86% in the same time period.

KPU's energy conservation success has been created through our many partners including design professionals, service technicians, building operators, BC Hydro, NRCan, the Province of British Columbia and more. Much of the energy efficiency work we have performed has been funded by either future avoided energy costs, or from financial assistance from NRCan, BCHydro, and the Province of British Columbia. In 2015, a contribution of $45,000 from the Ministry of Advanced Education enabled KPU to match the funds and perform the conversion of Domestic Hot Water tanks to instantaneous on demand water heaters at our Langley Main campus.

OVERVIEW

This report constitutes Kwantlen Polytechnic University's (KPU's) Carbon Neutral Action Report (CNAR) for 2015. Legislatively mandated, this is intended to meet the reporting requirements for the Carbon Neutral Government Regulation. It outlines our actual annual and cumulative greenhouse gas (GHG) emissions and offsets. It outlines the actions that were taken in 2015 to reduce KPU's GHG as well as the planned future actions for 2016. Finally, this report offers background information showcasing areas of the university's commitment to sustainability and energy conservation. Visit KPU's webpage on Sustainability and Energy for further details including archived records of KPU's previous Carbon Neutral Action reports (CNAR) and other valuable resources.

2015 CNAR Approval

Manager, Maintenance, Facilities Services	Maurice Bedard	
Vice President Finance & Administration	Jon Harding	

I. EMISSIONS AND OFFSETS, 2015

Green **H**ouse **G**ases consist of a variety of gaseous compounds that trap heat within the earth's atmosphere and create global warming. Historically quantities of these gases have existed in consistently stable quantities that were environmentally balanced to meet planetary life sustainability needs. It's been estimated that since the beginning of the industrial age carbon dioxide levels alone have increased by about 42%. This has led to increased heat retention and continually rising global temperatures.

The Provincial Government's Bill 44 targets carbon dioxide producing activities to compel pursuit of reductions and requires the purchase of Carbon Offset credits at $25 per ton of CO_2equivalent (tCO2e) (calculated using scientifically determined energy consumption quantity conversion equations), to generate funding for support of carbon reduction projects that reduce atmospheric GHG levels. Provincially legislated targets have been set to reduce GHG emissions from 2007 levels, 6% by 2012, 18% by 2016, 33% by 2020, and 80% by 2050.

2015 Greenhouse Gas Emissions

KPU's 2015 total emissions from all sources for Offsets were **2,199** tCO^2e, Producing a reduction of 183 tCO^2e, or an 8% decrease from 2014 emission levels. A reduction of 511 tCO^2e from base year 2007 building emissions of 2,710 tCO^2e, or a 19% reduction from the partial reporting year.

Emission Source	2011 (tCO2e)	2012 (tCO2e)	2013 (tCO2e)	2014 (tCO2e)	2015 (tCO2e)	2015 vs 2014
Buildings						
Diesel	4.39	1.91	4.08	0.96	7.49	680%
Electricity	284.85	280.99	163.19	116.35	112.51	-3%
Natural Gas	2424.83	2229.85	2246.6	2132.22	1963.89	-8%
Fleet	25.74	20.65	17.26	15.6	17.04	9%
Office Paper	151.34	132.31	114.33	117.72	98.57	-16%
Total Emissions	2891.15	2665.71	2545.46	2382.85	2199.5	-8%
Offset Exempt	1	1	1	1	1	
Total for Offsets	2890	2665	2545	2382	2199	**-8%**

Annual Fugitive Emissions generated by equipment using Hydrochlorofluorocarbon (HCFC) refrigerants remain well below 1% of our total emissions and were not reported in 2015, as permitted under regulatory guidelines.

Offsets Applied to be Carbon Neutral in 2015

KPU has been a Carbon Neutral organization since 2010 with an annual purchase of carbon offsets. For 2015 offsets purchased totaled 2199 tons of carbon emissions as identified in SMARTTool, at a cost of $57,723.75 including GST.

KPU spent $397,897 to purchase carbon offsets for 15,158 tons of carbon emissions during the period 2010 to 2015 including GST.

Emissions and Offset Summary Table:

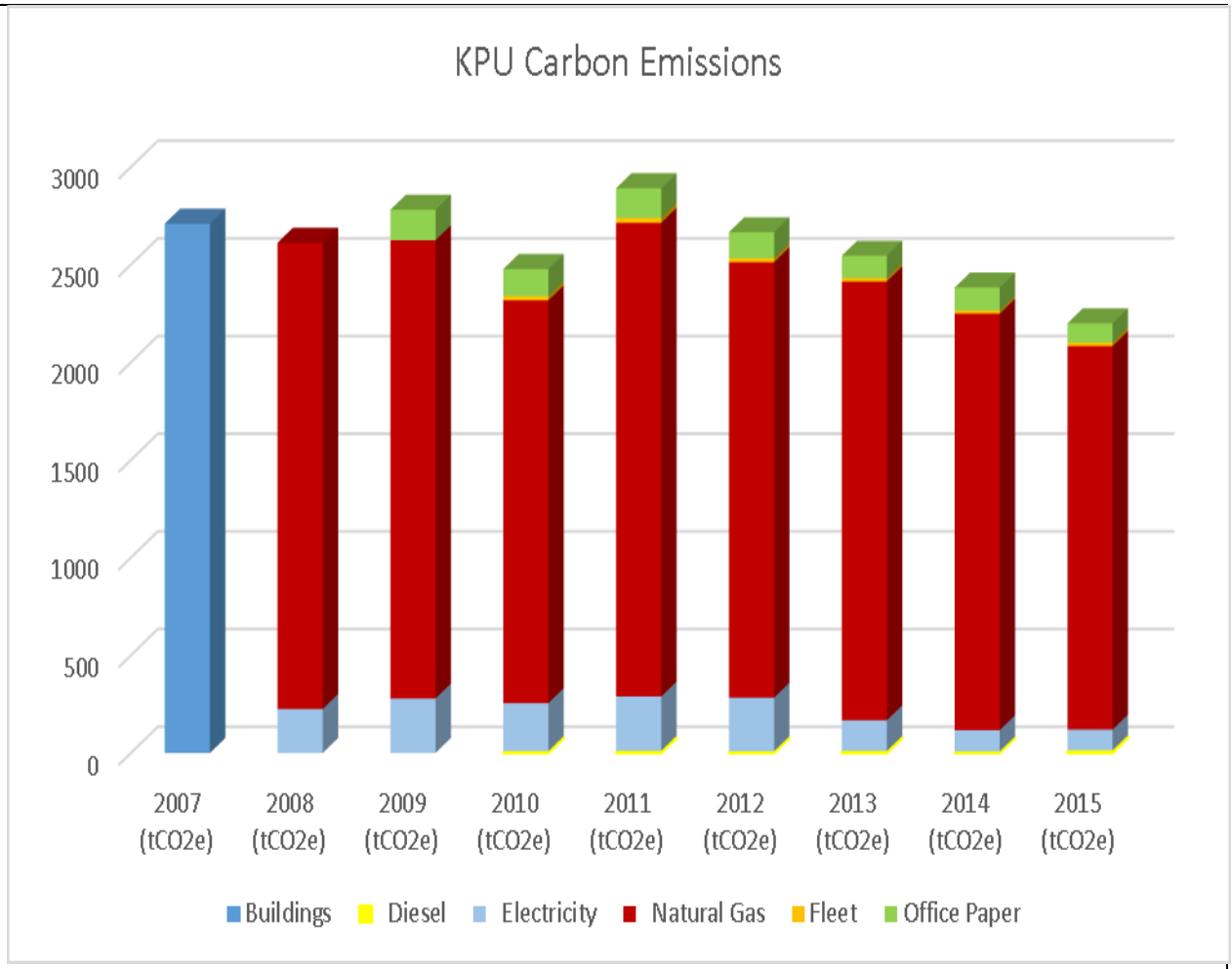
KPU GHG Emissions and Offset for 2015 (TCO2E)	
GHG Emissions created in Calendar Year 2015 *(from SMARTTool Homepage)*:	
Total Emissions (tCO_2e)	*2199*
Total Offsets (tCO_2e)	*2199*
Adjustments to GHG Emissions Reported in Prior Years *(from SMARTTool Homepage):*	
Total Emissions (tCO_2e)	*0*
Total Offsets (tCO_2e)	*0*
Grand Total Offsets for the 2015 Reporting Year *(from SMARTTool Homepage):* *(This is the total of emissions that must be offset for Reporting Year 2015)*	
Grand Total Offsets (tCO_2e)	2199

II. ACTIONS TAKEN TO ACCOMPLISH OUR 2015 GHG REDUCTIONS

KPU 2015 carbon emissions for buildings as calculated by the Provincial Government SMARTTool were 2,199 tCO2e. Producing a 19% reduction in emissions from the comparative 2007 buildings emission level.

The first complete reporting year for buildings and paper in the SMARTTool reporting system was 2009. In that year, KPU's total carbon emissions for offsets were **2,781** tCO_2e. KPU total carbon emissions for offsets for 2015 were **2,199** tCO_2e. This produced a **21% reduction** in emissions from 2009.

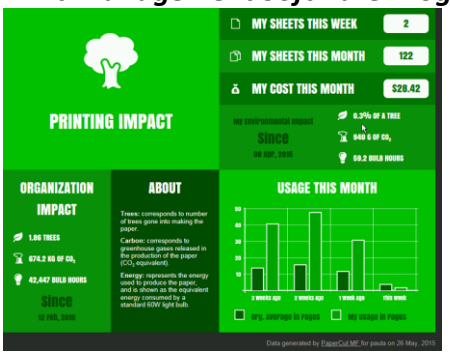
Emission Source	2007 (tCO2e)	2008 (tCO2e)	2009 (tCO2e)	2010 (tCO2e)	2011 (tCO2e)	2012 (tCO2e)	2013 (tCO2e)	2014 (tCO2e)	2015 (tCO2e)	**2015 vs 2014**	**2015 vs 2009**	**2015 vs 2007**
Buildings	2710											-23%
Diesel				2.78	4.39	1.91	4.08	0.96	7.49	680%		
Electricity		225.3	279.22	252.65	284.85	280.99	163.19	116.35	112.51	-3%	-60%	
Natural Gas		2386.84	2345.69	2062.07	2424.83	2229.85	2246.6	2132.22	1963.89	-8%	-16%	
Fleet				20.31	25.74	20.65	17.26	15.6	17.04	9%		
Office Paper			156.09	140.21	151.34	132.31	114.33	117.72	98.57	-16%	-37%	
Total Emissions	**2710**	2612.14	2781.00	2478.02	2891.15	2665.71	2545.46	2382.85	2199.5	-8%	-21%	-19%
Offset Exempt				1	1	1	1	1	1			
Total for Offsets		2612	2781	2477	2890	2665	2545	2382	2199	**-7.70%**	**-20.95%**	



- 2007: Internal energy records; buildings only (Base Year)
- 2008: Implementation of Smartool for Bill 44 legislation passed in 2007
- 2009: Buildings and paper now included
- 2010-current: Fleet and building diesel now included in calculations

During 2015 KPU continued to build on energy conservation successes and explore additional options for savings opportunities. Engineering assessments were undertaken to examine technological advancements and identify sustainable solutions for improving energy efficiencies while preserving or improving service delivery effectiveness. Sustainability is a key element of KPU as was evidenced by the diverse range of events sponsored by the University or attended by members of the Faculty, Staff and Student Body. The projects undertaken and events supporting 2015 environmental sustainability improvement and carbon emissions reduction efforts are listed in the following tables.

Infrastructure Projects and Partnerships

Paper Cut Program implemented ***Desk Top Printer Replacement Program &*** ***Print Management Software Program*** 	As part of the IT department's centralized copier replacement program, 2015's project dramatically reduces the number of individual printer/copiers in individual offices by replacing them with centralized print/copy stations. Along with the Printer/Copier replacement program, IT implemented a secure print service (employee card required). The software uses a dashboard to allow users to track their impact on the environment by totaling all ongoing print and energy usage. Success in other similar environments have achieved up to 30% reduction in paper usage. Though the program was not fully implemented until nearer the end of 2015 there was a drop in paper use carbon emissions from the 2014 level of 118 tonnes to 99 tonnes for a 16% reduction.
Domestic Hot Water Boiler Replacement Project, Langley Main Campus 	Replaced the Langley Main campus domestic hot water storage tank standby boilers that ran 24/7 to have water ready at all times, with 2 smaller condensing on demand boilers providing improved energy savings, greater demand control and reduced future maintenance costs.
Utility Sub-Meters Installed to Provide Energy Consumption Monitoring	The New KPU Brew Lab included meters for electrical, natural gas and water consumption monitoring to provide the opportunity to correlate the amount of each that is required to produce each batch of beer. This demonstrates how efficiency in utility consumption relates to the cost of production. Utility Sub Meters were also installed on the Domestic hot water system that was installed in the Langley Main campus to provide sub monitoring of energy consumption by that system.

KPU Energy Conservation Policy	An Energy Conservation Policy and associated Procedures came into effect on September 11, 2015. The Policy identifies energy conservation as a significant priority for the university while the procedures include items such as *Individual Actions*, *Technical Strategies*, and *Energy Awareness Training*. The procedures also define the temperature range KPU is committing to for classrooms and offices.
Sustainable KSA Shoreline Cleanup	The KSA organized an afternoon of cleanup along the Serpentine Greenway on Wed 16 Sep 2015
Exterior Lighting Improvement and Energy Conservation Opportunity Assessment of all KPU Campuses Initiated	MMM Engineering was contracted to conduct an in depth assessment of exterior lighting of all campuses and provide recommendations for engineered solutions to improve lighting effectiveness with new technologies that also increase energy efficiency, reducing electrical consumption and GHG emissions.
Interior Lighting Improvement and Energy Conservation Opportunity Assessment of all KPU Campuses Initiated	Stantec Engineering was contracted to conduct an in depth assessment of interior lighting of all campuses and provide recommendations for engineered solutions, to improve lighting effectiveness with new technologies, that also increase energy efficiency, reducing electrical consumption and GHG emissions.
Surrey Campus Geo-Exchange System Efficiency and Effectiveness Improvement Assessment Initiated	Stantec Engineering was contracted to conduct and assessment of the Surrey campus Geo Exchange system to identify opportunities to improve the efficiency and effectiveness to improve occupant conditions during the increasingly hot summer periods being experienced. Currently the field becomes saturated with heat in the peak months of July and August which reduces the ability to provide cooling and electrical consumption increases due to use of portable cooling alternatives.

Training and Awareness

Sustainable Agriculture & Food Systems Quarterly Newsletter 	The new quarterly newsletter for the Sustainable Agriculture & Food Systems programs is now available online. These publications contain news and articles related to local agriculture, updates on our research, information on our programs as well as local event listings. Sign up at the Sustainable Agriculture & Food Systems homepage.
Eighth season of Green Wednesdays Produced 	Hosted by the KPU School of Horticulture in collaboration with the non-profit Green Ideas Network, the eighth season of the eco-minded film series will featured dynamic documentaries and discussions on the ways energy, agriculture and consumption impact our daily lives. Everyone is welcome to join KPU students and faculty as they screen movies that tackle climate change, urban and rural sustainability, energy production, agriculture and food. The screenings often include informed guest speakers who spark spirited conversations on universal environmental and social issues. http://www.kpu.ca/news/eighth-season-green-wednesdays-launches-next-week
Kent Mullinix Talks Sustainable Food Systems at Science World Speaker Series 	Kent Mullinix, director of the Institute for Sustainable Food Systems at KPU, spoke about the need for a sustainable approach to growing our food at the recent session of the KPU-Science World Speaker Series on August 12, 2015. According to Dr. Mullinix, a truly sustainable food system for today needs to be rooted in the right context: a social, economic and environmental context very different from the one in which our contemporary industrial food system came to dominate. http://www.kpu.ca/news/video-kent-mullinix-talks-sustainable-food-systems-science-world-speaker-series

Former Chair of ALC talks Agriculture at KPU Richmond 	Mr. Richard Bullock, the former Chair of BC's Agricultural Land Commission, Okanagan farmer, and long-time proponent of BC agriculture, spoke at KPU Richmond on July 28th, 2015. Mr. Bullock shared his vision for a strong BC agriculture future and answered questions from the public. The free lecture was hosted by the Institute for Sustainable Food Systems at Kwantlen Polytechnic University. KPU's Institute for Sustainable Food Systems is an applied research group that focuses on bio-regional food systems projects, and municipally supported agriculture projects. For more information, visit kpu.ca/isfs. http://www.kpu.ca/news/video-former-chair-alc-talks-agriculture-kpu-richmond
From the Ground Up' enables KPU students to restore Logan Creek urban forest 	It's not easy being green, especially after decades of agricultural use and construction. But thanks to a $25,000 contribution from CN EcoConnexions *From the Ground Up* and its partners Tree Canada and Communities in Bloom, restoration of derelict wetlands around Logan Creek in Langley will be undertaken and led by horticulture students from Kwantlen Polytechnic University (KPU). "This student-driven project is an outcome of the first graduating class in our urban ecosystems degree program, and a wonderful example of experiential learning in the classroom," said Dr. Betty Worobec, dean of the Faculty of Science and Horticulture. Dubbed the Logan Creek Integrity Project, the long-term goal of the initiative is to restore and redesign 1.6 hectares (four acres) of urban forest along Logan Creek. This riparian area is one of few native ecosystems to remain on campus after decades of human uses that caused a loss of fish habitat, poor drainage and frequent flooding. "CN is pleased to be part of this effort to restore Logan Park as an upland forest that will be home to an ecosystem that nourishes vegetation native to the local

	region, including fruit-bearing and other edible plants traditionally used by the Kwantlen First Nation," said Emily Hamer, regional manager, CN Public & Government Affairs. "We are all neighbours working together towards a sustainable future." http://www.kpu.ca/news/ground-enables-kpu-students-restore-logan-creek-urban-forest
KPU and Science World launch new series with the 'sound of science' 	And science doesn't necessarily sound like you might think. From defining the ultimate sustainable food system, to how science affects the sounds we hear in the songs we love, a new speaker series launching this month is setting out to expand science literacy across generations with a roster of topics that address compelling, relatable and timely issues. Six instalments by Kwantlen Polytechnic University (KPU) and Science World British Columbia will kick off June 15 at TELUS World of Science with the world-renowned Borealis String Quartet on how construction methods and materials influence an instrument's sound. Spanning the 16th-18th centuries, the event will take guests on a musical journey through history and the etymologies of well-known string instruments. The series is a collaboration between KPU and Science World, and is in part funded by the Social Sciences and Humanities Research Council (SSHRC). http://www.kpu.ca/news/kpu-and-science-world-launch-new-series-sound-science
President's Dialogue Series welcomes Gwynne Dyer to KPU 	The environment, Canada's place in the world and the future of war are just a few of the things discussed by KPU President Dr. Alan Davis with Gwynne Dyer in the April 2015 installation of the President's Dialogue Series. A celebrated author, historian and independent journalist, Dyer holds a PhD in Military and Middle Eastern History, has produced several highly acclaimed television series and writes an international affairs column read around the world, from Vancouver, to Dubai, to Japan.

	On **April 27, 2015** Dyer brought his worldly insights to Kwantlen Polytechnic University in an informal, public sit-down conversation with Dr. Davis. "We're continuing an important conversation that began last year about ideas on key issues that face our society," said Dr. Davis. "KPU is proud to be able to provide a forum where local, national and international leaders can engage with our communities." The President's Dialogue Series welcomes leaders to KPU to join in engaging, informative and much-needed discussion. Speakers exemplify the university's polytechnic vision, and are leaders in the private and public sectors, both locally and globally.
Farm School grows from partnership between KPU and Tsawwassen First Nation 	The Tsawwassen First Nation Farm School will welcome its first crop of students this spring in a program that blends theory with practice on an eight-hectare (20-acre) working farm at the Tsawwassen First Nation (TFN). A partnership between Kwantlen Polytechnic University's Institute for Sustainable Food Systems (ISFS) and TFN, the 10-month program will cover the science and business of farming plus perspectives on indigenous food systems. The actual farm will include market crops, small livestock and organic practices. "The Tsawwassen First Nation Farm School fuses sustainable agriculture and traditional indigenous food systems as vital tools to build community and create the kind of critical dialogue and action around the future of food and earth stewardship," says Kent Mullinix, director of ISFS. Once fully in production, the farm will boast a traditional medicine garden and food forest, an orchard, an organic market garden and incubator plots for farm school students who have completed the first year of instruction and practicum. Ultimately, the teaching farm will be a gathering place to raise awareness around human-scaled alternative food production systems linked to community. TFN demonstrated its commitment to securing a future for agriculture in Delta more than a year ago when it

	announced 25-year lease agreements with local farmers on 156 hectares of farmland in Ladner. "TFN has been working hard to create a strong and sustainable community for our members and future generations," said TFN chief Bryce Williams. "All our developments – commercial, industrial, residential and agricultural – work together to support our vision. "TFN supports local food production, job creation and stewardship of farmland resources. We are proud to have partnered with KPU to create the TFN Farm School.
Kwantlen Street Market Sneak Peek	The KSA supported by KPU organized a sneak peek of the proposed Kwantlen Street Market on Tuesday September 8, 2015 to provide an opportunity to meet the nearly 30 vendors, and see the chef demonstrations.
ecoDay events held at KPU Langley, Richmond and Surrey campuses	Sponsored by the KSA and supported by KPU, on-campus sustainability events were held March 4th, 5th, and 10th, to showcase programs where students can learn about their community, find ways to get involved in and learn about how to make their lives more sustainable!

Awards and Recognitions

The Langley South Building achieved LEED Silver 	The previously vacant trades building at Kwantlen Polytechnic University's (KPU) Langley campus has a new second floor, a new moniker, and a new purpose-driven life. The building now accommodates classrooms, nursing labs, and critical care labs as the home of KPU's Faculty of Health. A new atrium space serves as the student commons, creating a "home away from home" for the students. With environmental stewardship as a driving priority for KPU, the primary sustainability strategy was to re-use the existing building. The revitalized space has improved energy performance due to a new building envelope and added windows for increased daylighting and natural ventilation. The project achieved LEED Silver Certification in July 2015.

KPU honours longtime Burns Bog advocate Eliza Olson 	If Burns Bog has a saviour, it's Eliza Olson. The first and only president of the long-established Burns Bog Conservation Society, Olson has worked tirelessly for more than 25 years, with minimal resources, to provide advocacy and education on the bog's importance to the region's flora and fauna, to the bird population of the entire continent, and to the overall ecology of the Fraser delta. Olson walked across the stage at Kwantlen Polytechnic University (KPU) in the fall of 2015 to receive an honorary degree in front of hundreds of graduates, many of whom have likely been alive for less time than Olson has been fighting for Burns Bog. "She has persistently stood up to protect Burns Bog and the region's wetlands from further encroachment," said Dr. Alan Davis, president and vice-chancellor of KPU. Davis says Olson represents the very best in sustained and dedicated service to the region, and he notes that much of her work aligns with KPU's programming and scholarly interests. She frequently engages with students in KPU's environmental protection technology program, and assisted them with the exercise of developing a draft peat removal bylaw.
Product design students, faculty create sustainable trophy 	The winner of Surrey's inaugural Greater Vancouver Clean Technology Championship will be taking home a trophy worthy of the title. Designed by product design students at Kwantlen Polytechnic University (KPU), the award itself is sourced from local, sustainable materials, and designed to be entirely biodegradable and recyclable. "The City of Surrey approached us with the idea to create a trophy that epitomized clean tech, and symbolized the city's growth in that sector," explained Iryna Karaush, product design program coordinator. "The enthusiasm from the students was inspiring. This is such a great opportunity, and I have been amazed by how much time, effort and excitement our students put into this project."

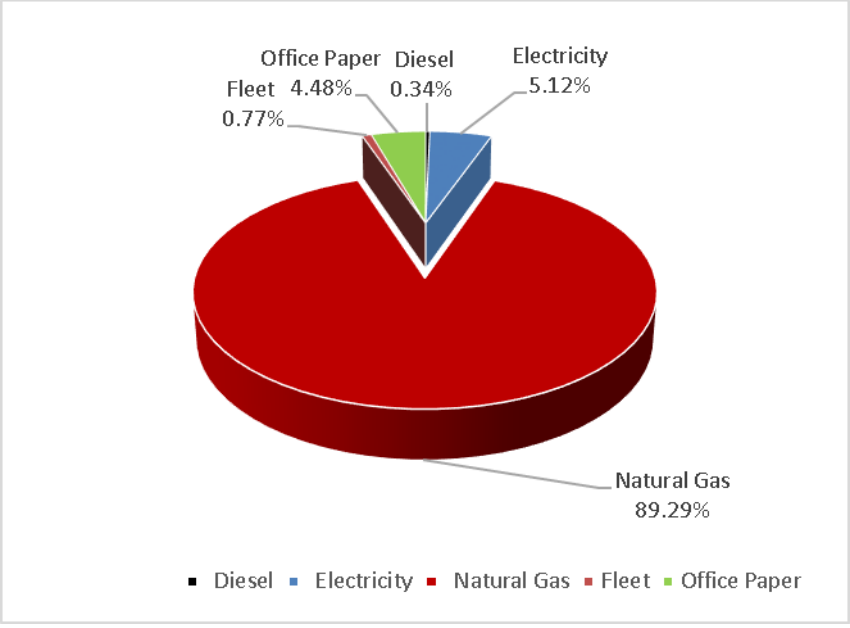
	The Clean Tech Championship trophy team comprises students Tzuyun Chang (Surrey), Stephen De Gouveia (Surrey), Guilherme Ortiz (Richmond), Marc Wilkinson, Jaymes Williams (Delta); product design program coordinator Iryna Karaush (Vancouver), instructor Victor Martinez (Richmond) and program technician Alan Rumpel (Delta). From brainstorming initial concepts to the trophy's final production, a KPU team of six students and three faculty members pulled the award together in a third of the time it would normally take. The project was their first real-world experience for most of the second- and third-year students. "Working with a client and collaborating with a team on a tight deadline was a great experience for us as students, something we can proudly put on our resumés," said second-year student Stephen De Gouveia, a Surrey resident. "It's opened a lot of doors. We've created something that will proudly be displayed across the region for the next 10 years." The trophy will be unveiled and awarded at Surrey City Hall during the Greater Vancouver Clean Technology Expo and Championship Jan. 28. "We are extremely pleased to partner with KPU's School of Design to create the trophy for this event. The quality of work exceeded all our expectations and speaks to the quality of KPU's design program," said Donna Jones, manager of economic development for the City of Surrey. The trophy design project is just one of many initiatives underway at KPU in the area of clean tech. Surrey is already home to approximately 10 per cent of BC's clean tech sector and as the largest university in Surrey, KPU is positioning itself to become Western Canada's top polytechnic institution for innovation in clean tech and green tech for Canada's resource industry. "Significant gaps exist in our understanding of how innovations in technology can be used to enhance clean air, clean water, and clean energy and to improve waste management processes," said Arthur Fallick, associate vice-president of research at KPU.

	"Through our partnership with the City of Surrey and Foresight Cleantech Accelerator Centre, KPU is committed to strengthen and broaden its program and applied research focus in this critical sector of the economy." From furniture to health technology to athletic gear, KPU's product design program develops designers who meet the needs of industry and consumers across sectors. For more information, visit: kpu.ca/productdesign.

III. FUTURE ACTIONS PLANNED FOR 2015

KPU entered 2015 with dedicated Facilities personnel focused on Energy Conservation and reduction of GHG emissions. This team and the university enter 2016 with continued established partnerships in external agencies such as the Province of British Columbia/ BC Hydro/ and Terasen Gas; new partnerships emerging in KPU's departments and faculty areas; and with an ever growing awareness of the connections and institutional participation already in place for Sustainability and Energy Conservation.

Of the 2,199 tCO_2e KPU produced in 2015, **1,964 tCO_2e** were produced by burning natural gas. Improving efficiencies in heating systems and exploring alternative energy heating sources is key to reducing GHG emissions.



Awareness and Training; Green Teams	KPU's early successes in conservation focused on major building systems. As the program becomes more refined, partnership with the faculty, students, and front line teams becomes ever more important. Continued participation at events, discussions, and the expansion of energy Green Teams increase awareness and improve both the understandings and opportunities for new operational efficiencies.
KPU Street Market at Richmond Campus Featuring local vendors	The KSA with the support of KPU is organizing a Street Market at the KPU Richmond campus to provide local Farmers and other vendors with a venue to offer their goods and services.
Heating System Efficiency Improvements	The feasibility of replacing aging inefficient boilers with higher efficiency condensing boilers and heat distribution piping will be explored to increase system efficiencies. Geo-exchange systems will be fine-tuned to maximize system operational effectiveness and with opportunities for new geo-exchange fields being explored.
Lighting Retrofits	Significant success in the past with lighting retrofits and emerging new technologies in the sector have KPU exploring additional lighting retrofit projects.
Monitoring and Metering Projects	To find new opportunities an understanding of current load demands is needed. KPU is targeting 2 areas in the university this year that could lead to future savings.
KSA Intercampus Shuttle Bus Shelters	The installation of bus shelters at the intercampus shuttle bays will increase ridership by enhancing the profile of this service as well as providing a more comfortable environment in seasonal conditions.

IV. KPU's COMMITMENT TO SUPPORT CARBON REDUCTION, SUSTAINABILITY, AND ENERGY CONSERVATION

Energy conservation is a strength with KPU's energy consumption 40% less than the average for post-secondary institutions within the Pacific Coast Region, (from the 2014 Association of Physical Plant Administrators' Facilities Performance Index , APPA FPI) KPU extends our conservation focus to embed it within business practices, academic offerings, and buildings.

The following are highlights from KPU's comprehensive report, Sustainability at KPU. Where Are We Now?

Sustainability in Academic Programs

KPU's Academic calendar offers over 16 degrees and 6 diploma/certificate programs that have an aspect of environmental sustainability. Program areas include but are not limited to Horticulture, Environmental Protection, Greenhouse and Nursery Production, Institute for sustainable Food Systems, Turf Management, Geography, Policy Studies, Interior Design, Graphic Design, School of Business, and the Faculty of Community & Health Studies.

Sustainable Principles in Facilities Operations

Facilities Services initiatives include;

- day time Custodial Services within a full Green Cleaning program ;
- optimized Building Management System controls with ongoing monitoring and verifications; and night audits and comprehensive maintenance contracts to ensure equipment is running at its most efficient.

Sustainable Landscape Maintenance Practices

Core principles in the delivery and design of landscape services include;

- plantings that require low maintenance and no irrigation after establishment;
- deciduous trees around building perimeters that provide summer shading/cooling and improved winter natural lighting during after leaf drop:
- rain water capture systems;
- green walls and a green roof under construction;
- and the ban of herbicides, pesticides, and phosphates in the core contract.

Comprehensive Waste Management and Diversion Program

Diverting over 25 consumer materials from the general landfill stream, KPU's waste management program utilizes the 3 R's principle of action; Reduce, Reuse, Recycle. The university is poised to launch its initial composting program in 2015.

Alternative Transportation Efforts

In its approach to support alternative transportation options, KPU has the following in place;

- student U-Passes promoting transit use that also offer discounted fitness club memberships and access to car sharing;
- an intercampus shuttle that made over 1,100 trips/ week in the Fall & Spring semester;
- carpooling options; Car-2 Go registry;
- bike storage at all and access to showers at most campuses (Richmond's in planning stage) ;
- dedicated E-car and Hybrid stalls at each campus.

Work Schedules

KPU encourages reduced commuting and travel between campuses with efforts such as;

- promotion and technologies to allow teleconferencing for meetings;
- hotel offices at each campus to provide less travel for faculty;
- on line classes;
- adjusted work week schedules and opportunities to work from home where practical.

Food Services

Food Services at KPU promote sustainable food options.

- The university has also partnered to bring Farmer's Markets to the Langley campus throughout the spring and summer and is exploring new opportunities for Winter markets and other campuses.
- The Langley Horticulture program provides locally grown produce for sale and a Student Food Bank initiative is in place.

Buildings and Energy

KPU's buildings are designed to minimize our environmental impact and energy consumption with outcomes than have led to an overall average less than 50% of the typical energy used by other North American post-secondary institutions.

- With optimized monitoring and controls in place, continuous focus is on front line teams for ongoing monitoring, building operator training; awareness training to service contractors such as Custodial and Security); and participation and partnerships with external agencies like BC Hydro.
- As leaders in energy conservation for over a decade, KPU's efforts towards energy conservation had resulted in 8 BC Hydro awards including Power Smart Leader and Power Smart Excellence.

Sustainable Building Design

KPU's construction projects are designed to meet or exceed LEED Gold requirements and all major renovations to exceed LEED Silver. The current LEED certified buildings include;

- **LEED Gold**: Surrey Arbutus (Coast Capital Savings Library) building (74% more efficient than the traditional model building), Cloverdale Campus (33% more efficient than a traditional campus); and Langley Institute for Sustainable Horticulture (ISH) Labs
- **LEED Silver**: Surrey Main building; Langley West Wing, Langley South Building.
- **LEED Pending:**, Richmond library

Awareness and Partnerships

The promotion of sustainability is embedded in important awareness activities with the university including;

- KPU's Sustainability and Energy website provides a number of detailed reports and resources for the community; Sustainability and Energy
- Internal and external partnerships and attendance at events.
- Internal champions are part of KPU's Sustainability committee; KPU Environmental Sustainability Committee .
- Green Teams in energy conservation unite building operators with department level expertise to understand local area energy use and saving opportunities.
- Attendance at conferences & student events, local area school districts and municipality partnerships.
- Promotion of global efforts such as Earth Day.

Strategic Energy Management Plan (SEMP)

As a leader in energy conservation, KPU's efforts have resulted in approximately a million dollars of avoided energy every 3 years.

- Its detailed Strategic Energy Management Plan SEMP has been identified as one of the most comprehensive energy reporting systems in the public educational sector.
- Along with the detailed energy records and achievements to date, the website inks to a number of resources such as Success Stories and a list of Efficiency Improvements Using Technology.

Information and Educational Technology (IET) Initiatives

KPU's IET department has a growing list of Sustainable Technology Initiatives including;

- remote shut down of computers;
- increased use of Thin Clients and lap tops replacing the more energy consuming office PC's;
- and server virtualization.

Government Reporting

KPU has taken many steps to reduce greenhouse gas emissions and energy consumption while being ever challenged by increasing building growth and increasing student enrollment.

- In 1995 the university joined the federal government's Energy Innovators Initiative and Canada's Climate Change Voluntary Challenge and Registry (VCR)
- Bill 44 and this Carbon Neutral Action Report outlines the specific greenhouse gas targets and accomplishments to date to achieve below 2007 levels by 2012 (6%), 2016 (18%), 2020 (33%) & 2050 (80%).
- Participation in the Public Sector Energy Conservation Agreement (PSECA) with specific targets to reduce energy consumption in 2011 (5%), 2016 (14%), and 2020 (20%).