

Strategic Energy Management Plan 2024



**THOMPSON
RIVERS
UNIVERSITY**



Senior Management Support:

A blue ink signature of Matt Milovick.

MATT MILOVICK, VP Administration & Finance

September 2024

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EXECUTIVE SUMMARY

Thompson Rivers University adopted its Vision Statement, consisting of Vision, Mission, Values and Strategic Change Goals, in the spring of 2020. The statement sets out the university's guiding map for the next decade.

One of the four Values of the Vision Statement is being a world leader in sustainability:

The natural world inspires us with wonder and reverence. We recognize how the health of our societies, cultures, and ecosystems rests upon wellness of people, biodiversity, and wise stewardship of precious and finite resources. As a world leader in sustainability, we know that the well-being of generations to come is shaped by what we do today.

TRU recognizes that how we manage our energy is one of the core pillars of being a sustainability focused institution. Energy is the master resource. A perfect example of TRU's commitment to managing energy wisely was evident during the groundbreaking in August 2024 of its new Low Carbon District Energy System (LCDES). After four years of planning, TRU finally launched the project, which is a partnership between the university and Creative Energy. It will help TRU achieve its 2030 goal of being 'zero carbon'. The system will utilize BC Hydro's clean electricity to power highly efficient and technologically advanced air and water source heat pumps to move hot water in underground pipes to all major buildings to heat them. This will virtually eliminate the need to use natural gas (a fossil fuel) for heating. The net result will be around a 95% decrease in greenhouse gas emissions from campus buildings by 2030, compared to 2020 levels.

- All buildings at TRU are enrolled in the BC Hydro Continuous Optimization Program, a multi-year program that utilizes energy management software to track energy efficiency. More than 90% of building space on campus is tracked through an online dashboard
- Over the past several years, more than 18 retrofits have been completed on campus buildings to achieve energy conservation objectives
- A retrofit of all campus lights (>20,000) to LED fixtures was completed
- On-site solar energy generation capacity was installed at the Campus Activity Centre in 2014 and on the new Nursing and Population Health building in 2020.
- An electric boiler plant was installed at the new Industrial Training and Technology Centre that is connected to the existing Trades and Technology building, achieving a 10% reduction in overall campus emissions

Thompson Rivers University has set an ambitious climate target of being carbon neutral and a net zero campus by 2030. Our 2024 Strategic Energy Management Plan provides our updated road map for current and future years to ensure we meet our goals and targets for reduced energy consumption and GHG emissions.

Section 1

Institution/Facility



Section 1: Institute Profile

Institute Name: Thompson Rivers University

Address: 805 TRU Way
Kamloops, British Columbia
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Tel: (250) 828-5000
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1.1 Key Personnel

Key Executive: Matt Milovick
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Title: VP Administration & Finance
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Key Contact: Natalie Yao
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Title: Energy Manager
E-mail: nyao@tru.ca

Key Contact: James Gordon
Telephone: (250) 852-7153

Title: Manager of Sustainability Programs
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Key Contact: Sofia Rueda
Telephone: (250) 852-7253

Title: Sustainable Energy and Transportation
Specialist
E-mail: mrueda@tru.ca

1.2 Institute Survey

Date Institute Formed: 1970
Total Area (m2): 120, 174.17
Number of Campuses: 2
Name of Campuses: Kamloops: 33
(#of Buildings): Williams Lake: 1
Number of Employees: 2, 711
Number of Students on campus: 12, 474
Number of Full Time Students: 9, 617
Number of Part Time Students: 19, 723

Full Time Equivalents (FTE): 11,396
Institute Fiscal Year Dates: Apr. 1 – Mar. 31
% Total Area heated: 98%
Number of Buildings: 35
Number of Buildings <10 years old: 4
Number of Buildings 10-25 years old: 7
Number of Buildings 25-40 years old: 6
Number of Buildings over 40 years old: 18

1.2.1 Facility Profile

Facility Profile							
Building Code	Building Name	Year Built	Size (m ²)	Additions (size/year)	Combined BEPI (ekWh/m ²)		
					2015	2016	2020
AE	Arts and Education	1991	5,661.62		279.35	266.37	n/a
AHT	Animal Health Technology	2002	1,180.66		686.11	569.35	n/a
CAC	Campus Activity Centre	1992	6,413.48	500/2012	261.09	287.53	n/a
CT	Clock Tower	1990	2,976.30		186.03	168.56	n/a
G	Gymnasium	1980	3,703.59		123.05	110.57	n/a
IB	International Building	2005	4,586.69		222.26	145.59	n/a
HOL	House of Learning	2011	6,552.7		140.75	246.82	n/a
LIB	Library	1975	3,350.64		123.79	226.64	n/a
OM	Old Main	1970	19,814.14	4500/2013	191.75	221.75	n/a
S	Science	1980	10,831.14		185.83	205.13	n/a
TT	Trades and Technology	1997	10,326.46		247.66	346.21	n/a
ITTC	Industrial Training and Technology Centre	2018	5344		n/a	n/a	n/a
NPH	Nursing and population Health	2020	4130.99		n/a	n/a	n/a
WL*	Williams Lake Campus	1973	7,435		97.43	95.19	n/a
TOTAL AREA- average BEPI			107,893.4	5000	225.4	235.27	-

Table 1 Summary of Facilities



Secondary Facility Profile

Building Code	Building Name	Year Built	Size (m ²)	BEPI (ekWh/m ²)	
				2015	2016
BCCOL	BC Centre for Online Learning	2007	4,334.81	288.11	275.06
CATC	Culinary Arts	1970	1,858.87	726.66	681.63
CS	Chemical Storage	1970	34.80		
DAY*	Daycare	1993	441.90	239.7	238.32
ED	Electrical Distribution Shed	1970	147.50	75.16	67.86
FAA***	Faculty Annex A	1971	***571.33	n/a	n/a
FB	Facilities Annex	1973	92.02	n/a	507.75
FSS*	Human Resources	1970	543.56	89.72	n/a
H01	House 1- Faculty Association	1945	128.90	n/a	n/a
H04	House4- Sustainability Office	1945	134.20	n/a	n/a
H05*	House 5- Aboriginal Cultural Centre	1945	138.50	26.95	25.13
H06*	House 6- Research Centre	1945	161.00	n/a	165.55
H07*	House 7- Research Centre	1945	175.50		
H08*	House 8- Radio Station	1945	130.80	n/a	n/a
H09*	House 9- Foundation/ Alumni	1945	267.18	n/a	173.14
H10*	House 10- Horticulture	1945	346.39	n/a	
HS*	Horticulture	1985	326.90	344.58	n/a
MDC	Materials Distribution Centre	2006	1,689.94	438.62	672.46
TTO	Trades Storage (no heating)	1997	1,184.00	n/a	n/a
CED	Continuous education building	1994	406	n/a	n/a
WS	Weather Station	2005	144.00	n/a	n/a
BEPI	Average- secondary buildings (kWh/m ²)		**	278.69	311.88
TOTAL AREA			12,686.77		

Table 2 Summary of Facilities

1.3 Background Description

1.3.1 General

TRU has two main campuses. The primary campus is located at 805 TRU Way, Kamloops. The secondary campus is located at 1250 Western Avenue, Williams Lake. There are also several minor regional campuses in Clearwater, Barrier, Lillooet, and Ashcroft.

1.3.2 Facility Components

Lighting and Electrical Systems:

All interior lighting is being upgraded to LED luminaries. Traditionally, buildings have utilized 32 W T8 lamps, though these are now being replaced by 12 W TLED lamps. These lamps are run primarily by standard efficiency instant start electronic ballasts. Most of the interior lighting is also controlled by timers and sensors.

Exterior lighting has just been upgraded to LED lighting. Exterior lighting is largely controlled by photocells and operates an average of twelve hours per day throughout the year. HIDs are also used in high ceiling areas such as the library atrium, Trades building workshops and the Gymnasium, but these are mostly Metal Halide lamps.

Across campus, exit signs are utilizing LED lamps.

Several C.Op round 2 projects are done and some are ongoing. Old Main and Williams Lake are the ones that were done recently, TRU expects around 455,000kWh savings from it.

HVAC Systems:

Each building has an independent heating system that uses a combination of natural gas and electricity. Current heating equipment varies in efficiency and age throughout the campus, with all aged equipment being replaced by high efficiency models or on the upgrading list. Cooling is supplied by electric powered chillers and air conditioners (smaller buildings). A complete list of HVAC equipment is available in a central database. TRU is committed to become carbon neutral by 2030, in turn, both new buildings (ITTC and NPH) are heated by electric boilers.

TRU is working on several DDC optimization projects at some buildings, the latest one was done at OM and 309,600GJ will be expected to be saved each year.

ISO 50001 (Energy Management System) project:

Funded by NRCan, TRU achieved ISO 50001 compliance in March of 2024. To kickstart this initiative, we've conducted a comprehensive gap analysis, meticulously identifying areas where improvements and adjustments are needed. We are now actively implementing our plan, making significant progress in improving our energy management practices and advancing sustainability efforts.

1.3.3 Energy/Utility Supply

Kamloops Campus

- Electricity for the Kamloops Campus is supplied by BC Hydro at rate 1611 (LGS conservation Rate).

Utility	Vendor	Rate	In effect	Marginal Electricity (\$/kWh)	Marginal Demand (\$/kW)
Electricity	BC Hydro	1611	August 2023 - Now	<ul style="list-style-type: none"> Basic charge: \$0.2708/day <ul style="list-style-type: none"> Energy charge: \$0.0614/kWh Power Factor surcharge: Applicable if power factor is below 97%. 	
Electricity	BC Hydro	1611	April 2023-July 2023	<ul style="list-style-type: none"> Basic charge: \$0.2698/day <ul style="list-style-type: none"> Energy charge: \$0.0612/kWh Power Factor surcharge: Applicable if power factor is below 97%. 	

Table 3 Electricity Rates (Not Including Taxes)

- Natural gas is transported by Fortis BC at rate 5.

Utility	Source	Rate	In effect	(\$/GJ)
Renewable Natural Gas	Fortis BC (Supplier)	5	January 2024 - Now	Storage and transport: 0.139/GJ Demand charge: 32.927/GJ Transportation firm: 1.361/GJ RNG charge: \$12.468/GJ
Renewable Natural Gas	Fortis BC (Supplier)	5	April 2023 – December 2023	Storage and transport: 0.679/GJ Demand charge: 30.278/GJ Transportation firm: 1.217/GJ RNG charge: \$14.718/GJ

Table 4. NG Rates (Not Including taxes)

Other campuses/locations

Locations	Utility	Source	In Effect	Rate	(\$/GJ)
Williams Lake	Electricity	BC Hydro		1600	Same as 1611
Williams Lake	Natural Gas	Fortis BC	Jan 2024 – Mar 2024	23	<ul style="list-style-type: none"> Basic charge/day: \$4.8026 Delivery charge: \$4.316/GJ Storage and transport: \$0.208/GJ Cost of gas: \$2.230/GJ
Williams Lake	Natural Gas	Fotis BC	Oct 2023 – Dic 2023	23	<ul style="list-style-type: none"> Basic charge/day: \$4.8026 Delivery charge: \$3.816/GJ Storage and transport: \$0.984/GJ Cost of gas: \$2.230/GJ
Williams Lake	Natural Gas	Fortis BC	Jul 2023 – Sept 2023	23	<ul style="list-style-type: none"> Basic charge/day: \$4.8026 Delivery charge: \$3.816/GJ Storage and transport: \$0.984/GJ Cost of gas: \$3.159/GJ
Williams Lake	Natural Gas	FortisBC	Apr 2023 – Jun 2023	23	<ul style="list-style-type: none"> Basic charge/day: \$4.8026 Delivery charge: \$3.816/GJ Storage and transport: \$0.984/GJ Cost of gas: \$4.159/GJ
Clearwater	Electricity	BC Hydro	Aug 2023 – Mar 2024	1300	<ul style="list-style-type: none"> Basic Charge: \$0.3694/day Energy Charge: \$0.1270/day
Knutsford	Electricity	BC Hydro		1300	
Cleawater	Electricity	BC Hydro	Apr 2023 – Jul 2023	1300	<ul style="list-style-type: none"> Basic Charge: \$0.3679/day Energy Charge: \$0.1265/day
Knutsford	Electricity	BC Hydro		1300	

Table 5. Other Campuses/Locations NG & Electricity Rates (Not including taxes)

1.4 Energy Metrics/Key Performance Indicators

Due to technical issues with the old EMIS, TRU is in the process of transitioning to a new system. The COVID situation delayed progress; however, we have now begun collecting energy data from each building. As the data collection is still ongoing and not yet complete for the entire year, we will not be able to calculate the BEPI until full-year data is available.

Section 2

Environmental Sustainability Policy



Section 2: Environmental Sustainability Policy

2.1 Commitment by Institute

TRU takes energy management and, more broadly, sustainability, very seriously. This commitment is evidenced in many ways.

Regarding energy management, TRU recently committed to be in compliance with ISO 50,001 standards. This internally recognized standard sets the highest of benchmarks for outstanding energy management practices. TRU has also participated in the BOMA Best program for over a decade. This program not only ensures outstanding energy performance within its stable of campus buildings, but also ensures high standards of other sustainability-focused areas such as zero waste. On a specific project scale, after four years of planning, TRU finally launched the groundbreaking of its innovative, Low Carbon District Energy System (LCDES). This project is a partnership between the university and Creative Energy and will help TRU achieve its 2030 goal of being 'zero carbon'. This new system will utilize BC Hydro's clean electricity to power highly efficient and technologically advanced air and water source heat pumps to move hot water in underground pipes to all major buildings to heat them. This will virtually eliminate the need to use natural gas (a fossil fuel) for heating. The net result will be around a 95% decrease in greenhouse gas emissions from campus buildings by 2030, compared to 2020 levels.

On a broader and institution-wide perspective, TRU has shown outstanding sustainability leadership since it first opened the Sustainability Office in 2009. In 2018, TRU became the first institution in Canada to achieve the coveted Platinum status in the STARS report. It then became the first institution in Canada to receive Platinum twice when it's submitted its next report in 2022. Over 350 institutions around the world participate in the Sustainability Tracking, Assessment & Rating System™ (STARS®) program, which is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance. STARS is intended to engage and recognize the full spectrum of higher education institutions, from community colleges to research universities. The framework encompasses long-term sustainability goals for already high-achieving institutions, as well as entry points of recognition for institutions that are taking first steps toward sustainability. Finally, as further evidence of TRU's commitment to sustainability, the following is from the TRU Environmental Sustainability Policy:

Thompson Rivers University (TRU) is committed to being one of the top universities regarding overall performance in sustainability. As is stated in the TRU Vision Statement, "The focal point of the statement is the Secwépemc word Kw'seltnéws, which means we are all related and interconnected with nature, each other and all things." Because of this, and in light of the litany of core environmental elements around the world that are threatened, a concerted effort must be made to include sustainability and environmental, social, and economic factors in decision making.

The University is a signatory to the following environmental or sustainability-focused initiatives and, as such, will comply with the spirit and reporting requirements of each one:

- The University and College Presidents' Climate Statement of Action for Canada (2008).
- Taillores Declaration (2010)
- Race To Zero for Universities and Colleges ('climate emergency letter') (2021)
- SDG Accord (2022)

The University has a significant role to play in preserving the local and global environments. TRU seeks to be the University of Choice for students concerned about environmental sustainability and to be recognized for its leadership and stewardship in responding to environmental challenges.

This policy will assist members of the University community to understand and fulfill their responsibilities with respect to environmental sustainability.

For TRU's Environmental Sustainability Policy, see Appendix B, page 24

In 2014, TRU developed a Campus Strategic Sustainability Plan (CSSP) to align divisional and departmental resources to meet the goal of "Increasing Sustainability", one of 5 Strategic Priorities (2014-2019). This followed with a similar but more comprehensive five-year CSSP (2020-2025). This plan is comprehensive in nature and includes 117 recommended strategies across four key focus areas (goals): Operations & Planning, Advocacy & Engagement, Learning, and Administration. These strategies are not all the responsibility of one department or office, rather they are shared among many. The CSSP is intended to provide a framework for various TRU departmental and operational units who have a role in advancing the campus sustainability initiatives. This comprehensive approach will allow each office or department to see where and how it can play a role in TRU's sustainability journey. 12 of the 117 goals and initiatives are directly linked to either energy conservation, wise energy use, or renewable energy production.

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2.2 Energy Management Objectives

The University is committed to continuously improving energy performance in its facilities and activities, and the Energy Management System, while minimizing its environmental footprint. This commitment is guided by the following objectives:

- Establish energy and greenhouse gas targets that are reviewed annually and updated as needed.
- Ensure employees receive ongoing training in energy management specific to their role within the organization.
- Maintain an active workplace energy conservation awareness program for all employees.
- Ensure that all documentation related to energy performance is available to employees based on their specific roles within the organization, including objectives, targets, and operating procedures.

- Ensure all legal and other requirements related to energy efficiency, energy use, and energy consumption are met.
- Ensure that the procurement of equipment and services that impact energy performance includes consideration for energy efficiency and energy performance improvement. vii. Ensure that the design of new buildings and/or facilities include consideration for energy efficiency and energy performance improvement.
- Ensure maintenance of BOMA BEST certification for all existing and new buildings
- Ensure that this Policy is available as documented information, communicated within the organization, and available to interested parties, as appropriate.

The University is committed to aligning its energy management practices with ISO 50001 at the Kamloops Campus. This applies to all Kamloops Campus activities and facilities including buildings and fleet.

2.3 Energy Management Benefits, Targets/Budget (2012-2024)

The first year of energy management objectives included a Detailed Energy Audit (DEA) of the primary buildings on campus and a preliminary energy audit of the secondary buildings. The results of the DEA indicated that TRU's commitment to a 10% reduction target in electrical and gas consumption was a realistic goal for 2010-2011, which was successfully exceeded with an 11-12% reduction. Over the following years, TRU continued to set and meet ambitious energy reduction targets, achieving cumulative reductions through different initiatives. Notably, TRU achieved 5% reduction in 2022-2023 and aims for a 1.3% reduction in 2023-2024.

By consistently meeting these energy reduction targets, TRU has significantly lowered energy costs, reduced greenhouse gas emissions, and minimized overall environmental impact. The implementation of well-designed mechanical and electrical systems has improved thermal comfort and well-being for building occupants, contributing to a more productive and healthier campus environment.

Targets			
Year	Reduction	Projects	Target met
2010-2011	10 % = 1.5 GWh	See table 4.1.1	✓ (11-12%)
2012-2013	6.6 % = 1 GWh	See table 4.1.2	✓ (6.6%)
2014-2015	3.6 % = .55 GWh	See table 4.1.3	✓ (4.2%)
2015-2016	6.6 % = 1 GWh	See table 4.1.3	✓ (6.6%)
2016-2017	5 % = .75 GWh	See table 4.1.3	✓ (5%)
2017-2018	3%	See table 4.1.3	✓ (3%)

2018-2019	3%	See table 4.1.3	✓ (3%)
2019-2020	3%	See table 4.1.3	✓ (3%)
2020-2021	3%	See table 4.1.3	✓ (3%)
2021-2022	3%	See table 4.1.3	✓ (3%)
2022-2023	5%	See table 4.1.3	✓ (5%)
2023-2024	3%	See table 4.1.3	✓ (3%)
2010-2024 (total)	48%	See tables 4.1.2-4.1.3	48%

Table 6. Energy Management Target

Budgets		
Department	Dates	Budget
Environment & Sustainability- Energy projects	2012	\$170,000 (projects completed)
Environment & Sustainability – Operating	2013	\$500,000
Environment & Sustainability – Energy Projects	2014-2015	\$600,000 (not including VDI transfer project)
Environment & Sustainability – Energy Projects	*2015-2016	\$700,000
Facilities Operation	2016	5.1 million
Facilities Maintenance	2016	2.4 million
Facilities Operation	2017	1.5 million
Sustainability Energy Projects	2017-2018	1.2 million
Sustainability Energy Projects	2018-2020	2 million
Sustainability Energy Projects	2020-2021	1 million
Sustainability Energy Projects	2021-2022	\$300,000
Sustainability Energy Projects	2022-2023 ¹	\$500,000
Sustainability Energy Projects	2023-2024	\$353,984 (conservation projects only)

Table 7. Energy Management Budgets.

*Revolving fund established in 2012 from savings generated after original retro-fit project, fund will top out at \$400,000K

¹ For conservation projects.

2.4.1 Key Personnel

Planning Team		
Name	Title	Roles/Responsibility
Matt Milovick	VP Finance/Administration	Executive sponsor
Warren Asuchak	Director, Facilities & Sustainability	Energy Manager, Organize in house staff, technicians and resources
Natalie Yao	Energy Specialist	Implement energy projects
James Gordon	Manager of Sustainability Programs	Support behaviour change programs
Sofia Rueda	Sustainable Energy and Transportation Specialist	Support the energy and transportation projects implementation
Environment Advisory Committee	All members: Students, Staff, Faculty, Admin, and Board-Appointed Members	Review and advise on note-worthy energy projects as reported on monthly by TRU Energy Manager

Table 8.a. Planning Team Description

2.4.2 External/Internal Stakeholders

Name	Title/Organization	Roles/Responsibility
Student	Student representatives on Environmental Sustainability Advisory Committee	Promote ongoing sustainability awareness campaign
Faculty/Staff	Environmental Advisory Committee	Draft/present sustainability policy to board of governors
City/Greater community	City of Kamloops	Work together towards energy reductions (district energy talks, waste heat recovery, transportation issues for students/staff)
BC Hydro Power Smart staff	BC Hydro	Provide support/resources to help TRU reduce energy
FortisBC Energy Efficiency & Conservation Team	FortisBC	Provide support/resources to help TRU reduce energy
Climate Action Secretariat	BC Government	Draft policies, provide support to public sector to promote reduction in GHG emissions

Table 8.b. Stakeholders Description

Section 3

Energy Use and Costs



Section 3: Energy Use and Costs

3.1 Energy Consumption and Costs

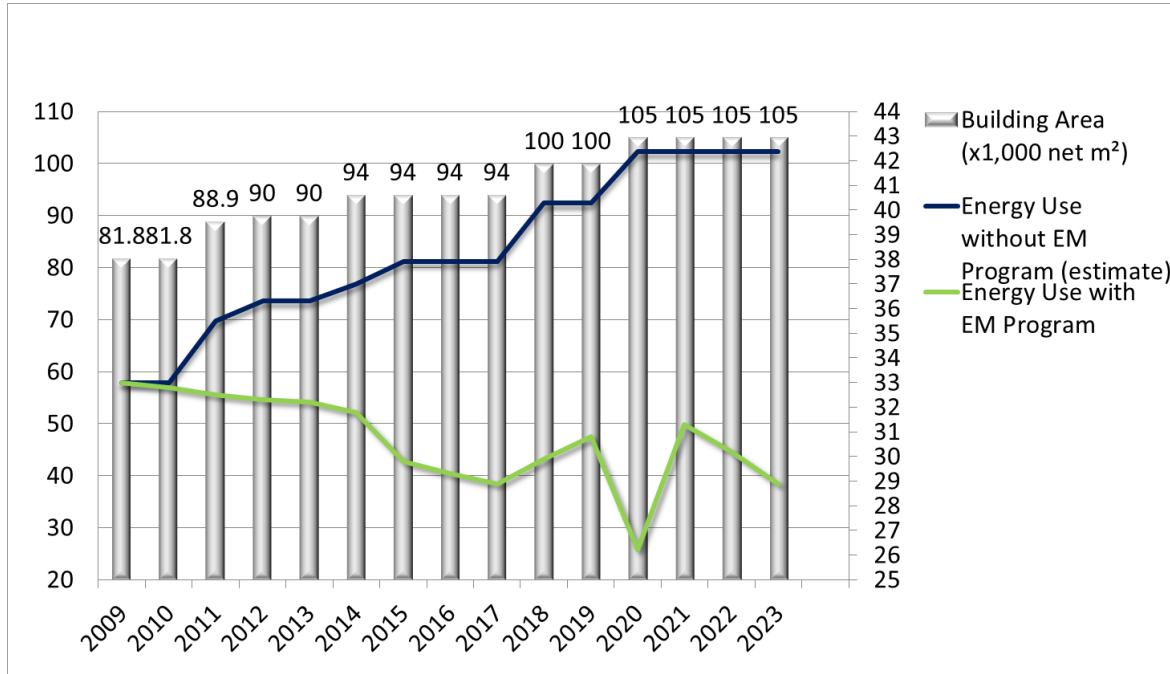


Table 9.a. Comparison of Annual Energy Use w/ and w/out Energy Management Program (EKWh)

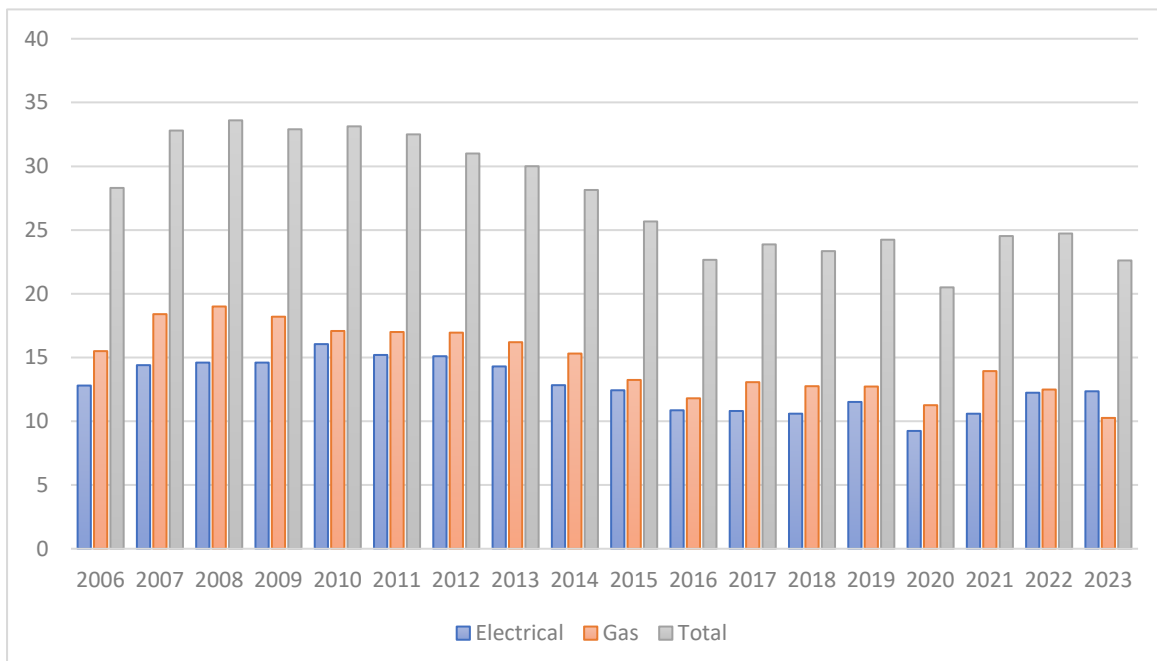


Table 9. b. Building Energy Performance Index (BEPI)

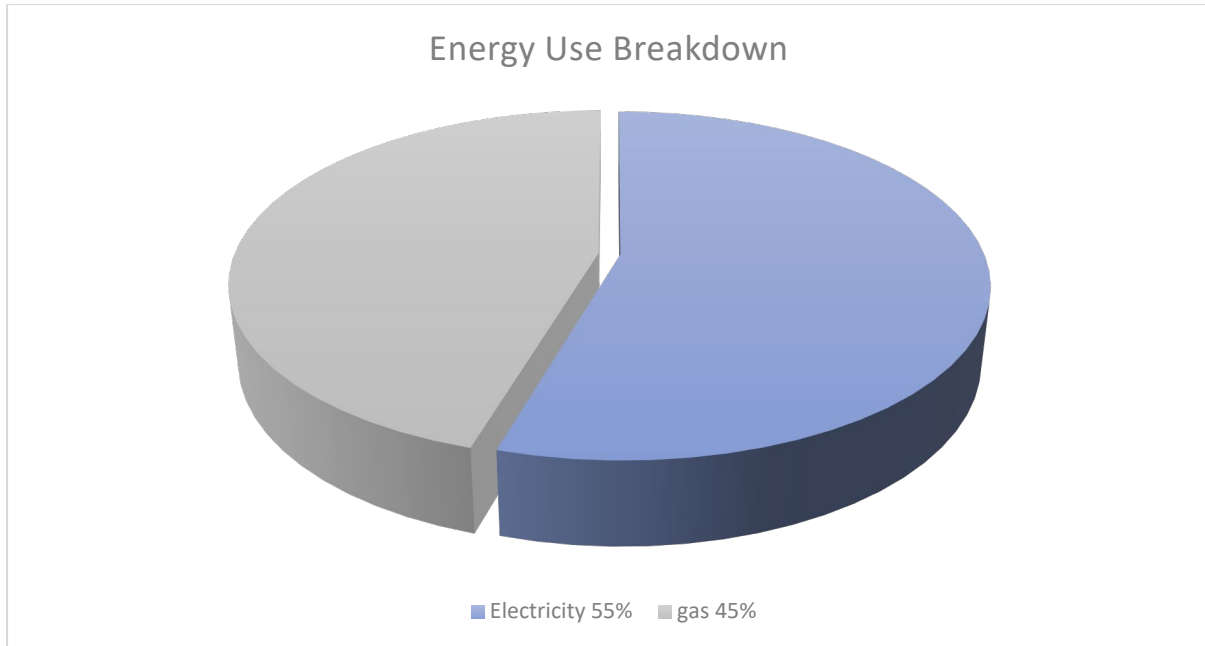


Figure 1. Breakdown of Institute Energy Use

3.2 Greenhouse Gas Information

Annual Greenhouse Gas Emissions

Year	Electrical			Fuel			Total	
	kWh	e kWh	GHG (tonnes)	GJ	e kWh	GHG (tonnes)	e kWh	GHG (Tonnes)
2007	15,104,403	15,104,403	347.4	69,384	19,273,195	3,459.8	34,377,598	3,807.2
2008	15,283,229	15,283,229	427.9	71,706	19,918,306	3,575.6	35,201,535	4,003.5
2009	15,367,200	15,367,200	430.3	68,832	19,120,111	3,432.3	34,487,312	3,862.6
2010	16,058,604	16,058,604	400.43	67,140	18,650,108	3,377.17	34,708,712	3,777.6
2011	15,026,400	15,026,400	370.17	66,497	18,471,388	3,335.49	33,497,788	3,706
2012	15,254,565	15,254,565	378.93	61,028	16,952,222	3,061.16	32,206,787	3,440
2013	15,194,536	15,194,536	377.44	61,094	16,970,555	3,054.7	32,165,091	3,432.14
2014	14,916,000	14,916,000	372.9	64,075.5	17,798,750	3,203.78	32,705,750	3,576.68
2015	14,450,400	14,450,400	361.26	55,390.6	15,386,278	2,769.53	29,836,678	3,130.79
2016	13,766,400	13,766,400	357.93	56,021.1*	15,561,416.7	2,544.12	29,327,816.7	2,709.31
2017	13,696,800	13,696,800	356.12	59,623.6*	16,562,124	2,731.15	30,258,924	3,087.27

2018	13,490,400	13,490,400	350.75	58,445.40	16,234,846	2,672.27	29,725,246	3,023.02
2019	14,663,109	14,663,109	156.46	59325.2	16,201,444	2,966.26	30,864,553	3,122.72
2020	11,805,840	11,805,840	125.97	51,785.7	14,384,928	2,589.28 5	26,190,768	2,715.25
2021	13,531,200	13,531,200	131.25	64,081	17,800,277	3041.55	31,331,477	3,172.80
2022	15,633,021	15,633,021	179.78	57,432.9	15,953,596	1,059.57	31,586,617	1,239.35
2023	15,777,600	15,777,600	178.29	47,191	13,108,677	0	28,886,277	178.29

Table 10. Summary of Annual Greenhouse gas Emissions. (*including 3,250 RNG)

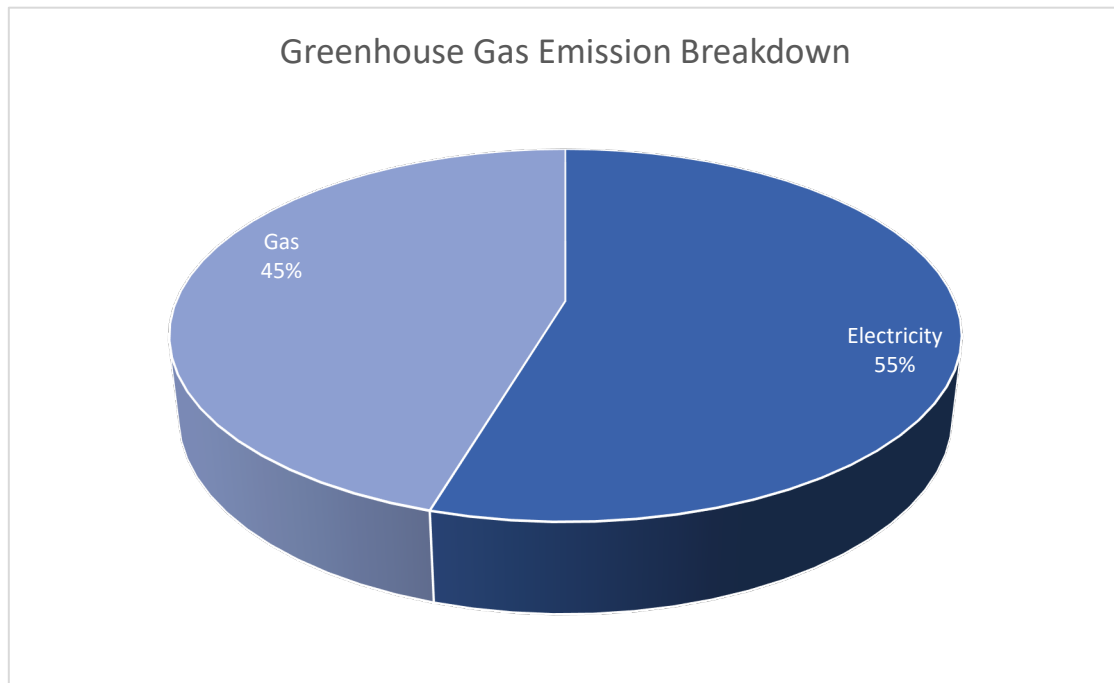
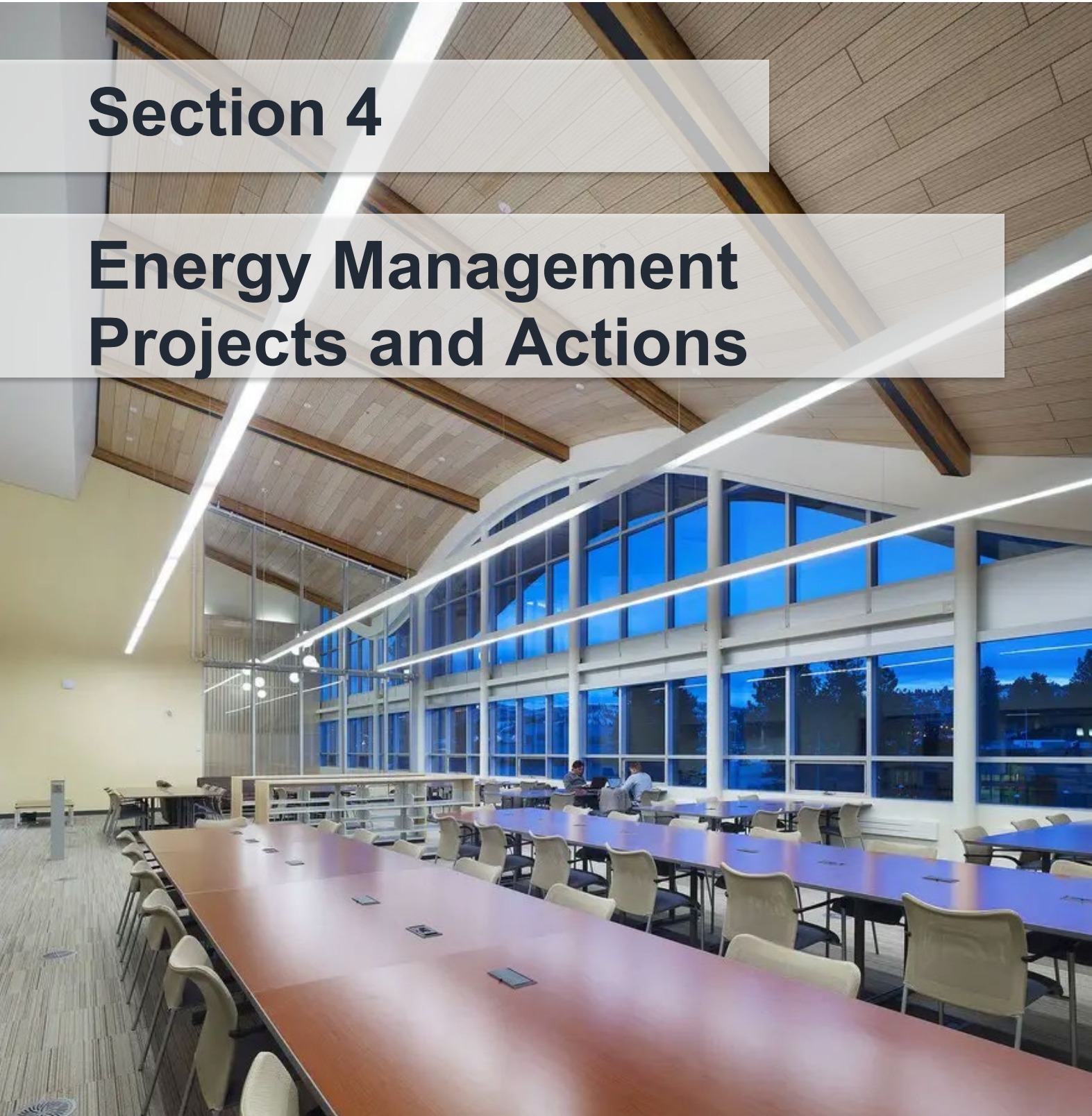


Figure 2. Breakdown of the Institute's Greenhouse Gas Generation

Section 4

Energy Management Projects and Actions



Section 4: Energy Management Projects and Actions

4.1 Past and Current Projects and Actions

4.1.1 Completed Energy Conservation Projects (2023-2024).

ECM	Demand Savings (kW)	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel savings (\$)	Total Cost Savings (\$)	Incentive Savings (\$)	Budget Retrofit Costs	Simple Payback (yrs)
2023-24									
C.Op Round 2 OM	761	309,600	\$27,864.00	1290	\$14,964.00	\$ 42,828.00	\$13,200	\$99,682	2.0
C.Op Round 2 WL	NA	155,876	\$14,028.84	797	\$ 9,245.20	\$ 23,274.04	\$11,890	\$35,070	1.0
ISO 50001		NA	NA	NA	NA	NA	\$180,000	\$219,232	NA
Total 2023		465,476	41,893	2,087	24,209	66,102	25,090	353,984	

Table 11. Completed Energy Conservation Projects (2023-2024)

C.Op Round 2 – OM: The project focused on implementing energy-saving strategies in various systems throughout the building. New measures included scheduling exhaust fans on multiple floors, reprogramming radiator mix valves, and re-programming chiller operations. Additionally, the replacement, repair, and recommissioning of outdoor air temperature sensors were carried out, as well as the commissioning of heating and cooling control valves for air handling units.

Previous measures included optimizing scheduling and starting protocols, resetting heating water supply temperature, adjusting supply air temperature and pressure, and implementing demand-controlled ventilation. While some previous measures, such as the computer lab scheduling and variable air volume (VAV) upgrades, are still functioning effectively, others required rectification or were abandoned.

C.Op Round 2 – WL: The project involved multiple measures targeting energy efficiency and improved HVAC system performance. New measures included scheduling optimizations for the HVAC system, adding an unoccupied override mode, and closing mixed air dampers for improved energy control when areas were unoccupied. Morning warm-up mode for air handling units (AHUs) was implemented to enhance comfort. Installation of occupancy sensors, push-button timers, and door interlocks enhanced control over specific building areas, particularly in the auto shop and Gathering Place. Exhaust fans were installed for overload washrooms, and a CO2 sensor was repaired to maintain indoor air quality. Previous measures were also addressed, such as reestablishing weekly schedules for continuously operating units,

holiday scheduling adjustments, and attempts to align occupancy schedules with optimal starting settings for ventilation air volume (VAV) control.

Thompson Rivers University (TRU) has successfully implemented the ISO 50001 Energy Management System, achieving compliance in March 2024. This internationally recognized standard provides a systematic approach to enhance energy performance, ensuring that energy efficiency is integrated into TRU's organizational culture. By following the plan-do-check-act cycle for continuous improvement, TRU has developed policies for more efficient energy use, set targets and objectives, and established a framework to measure and review energy performance. This compliance underscores TRU's commitment to sustainability and the reduction of greenhouse gas emissions while promoting ongoing energy management improvements.

4.1.2 Completed Renewable Energy Projects

Section	Measure	Electrical Savings (kWh)	Electrical Savings (\$)	Fuel Savings (GJ)	Fuel Savings (\$)	Total Cost Savings (\$)	Incentive Savings (\$)	Budget Retrofit Costs (\$)	Simple Payback
	**Solar DHW- OM			800				72,000	0
	**Solar DHW- CAC			600				108,000	0
	**Solar DHW- CATC			465				82,000	0
	Solar PV - TRUSU	10,000						54,452	20
	Solar PV-Trades	10,000							
	Solar Compass	5,000							
	Solar sidewalk	1,312							
	Solar PV-NPH	60,000							
	Solar PV-WL	110,000							

Table 11. Summary of Renewable Energy projects

4.1.3. Low Carbon Electrification projects

The BC Government has amended the Clean Energy Act to enable BC Hydro to begin offering incentives to its customers to electrify equipment. In the meantime, the government launched EfficiencyBC program, which offers 7 million dollars incentive over 2 years for commercial, institution and Multi-family buildings, 50% of the incentives will be given to electrification projects. TRU is working closely with BC Hydro on low carbon electrification projects. (Appendix C)

4.2 Proposed Projects (2024-2025)

Project List									
FY24-25 Projects									
Project Name	BC HydroP roject Type	Elec Savings kWh/year	BC Hydro Claimed Savings kWh/year	Total Project Cost	BC Hydro incentive \$	Simple Pay Back	Start Date	% Completed	Est completion date
F24-25							Est Start Date		Est completion date
Lighting Retrofits (OM, Trades, IB)		68,000		\$175,711	\$23,012				
C.Op Science building		53,000							
Rooftop Solar PV	Solar PV	404,800		\$900,000	\$338,000	15 years			
Scheduling and Occupancy sensor and BCCOL and GYM		50,000							

Table 12. Proposed projects

4.3 Training, Communication and Awareness Programs

A successful training, communication and awareness program is an integral part of TRU's energy management plan. The following is a description of ongoing and future strategies:

Training

- TRU's *Energy Management System (EnMS) online course* was launched in July 2024. This 15-minute course is designed to educate all TRU employees (approx. 2200), and the goal is getting 100% compliance by January 31, 2025.
- There is ongoing staff training for all energy-related equipment (smart bars, space heaters, etc.).
- A new position – the Sustainable Energy and Transportation Specialist – was filled in January 2024. This person works closely with the Energy Manager to advance energy-related initiatives.
- (on hold as of Sept 2024) The TRU Staff & Faculty Sustainability Ambassadors Program provides opportunities for all staff and faculty members to learn about a variety of sustainability and energy-related matters in various campus offices and departments. The program runs all year but is on hold pending the hiring of a staff member to coordinate the program.

Communication and Awareness

- The Marketing and Communications Coordinator role has been vacant during the summer of 2024, but it will be filled by October 2024. The role is dedicated to promoting and helping to facilitate office initiatives, which includes energy-related conservation programs and projects.
- Maintain and update website and social media sites (Facebook, Instagram, blog) to inform and engage the entire TRU community in energy, sustainability and environmental related projects and initiatives
- Develop comprehensive media campaigns for most campaigns and outreach opportunities, including the use of social and traditional media (closed-circuit TV ads, direct emails, posters/handbills/banners, booths at events, radio/TV interviews, and posts on TRU Connect (the employee digital newsletter).
- Engage in campus activities by informing students, faculty and staff of ongoing sustainability projects and initiatives through participation at kiosks, tables, coffee/lunch meetings, regular club/office meetings, video meetings, conference calls, etc.
- TRU is disclosing their efforts through Building Benchmark BC, Building Benchmark BC is a voluntary benchmarking and disclosure program. The public can verify the energy performance of TRU buildings against buildings of the same property type.

Energy Wise Network Program

The TRU Sustainability Office has been part of the Energy Wise Network Program (EWN) since its inception. The program is funded by BC Hydro and FortisBC and provides support for certain BC organizations and institutions to design and deliver energy conservation engagement programs that encourages staff and student action to establish a lasting culture of conservation and a spirit of sustainability within the organization. The program provides a strategic framework and ongoing support to increase conservation knowledge and awareness and inspire the action and leadership that is required to realize energy savings. TRU joined the program in 2016, and has run multiple campaigns about energy conservation pledges, lighting, monitors, plug-load and temperature settings.

https://www.bchydro.com/powersmart/business/programs/workplace-conservation.html?WT.mc_id=rd_worksmart

- Space Heater Defeater Program – December 2022/May 2023). This was TRU's 2022/2023 and 2023/2024 campaign in the Energy Wise Network Program. The Space Heater Defeater Program will give out free electric seat heaters - typically 40 to 75 watts - to staff and faculty members who are cold while sitting at their desks if they give up their current space heater, which is typically 1000 to 1500 watts.

This campaign aligns with three main TRU organizational priorities: conserving energy and engaging TRU community members in energy-saving behaviour-change initiatives; maintaining a comfortable and safe work environment for all staff and faculty; and reduce the number of complaints calls regarding heating and cooling going to the Facilities Department.

Campaign plan: Campaign goals were fourfold, to swap out 30 current electric space heaters for electric seat warmers; have a 90% satisfaction rating from all participants in the program; engage with all (approximately 75) offices on the

campus regarding this campaign and the energy conservation aspects of it; and report back at the end of the campaign to the campus community regarding outcomes.

Anticipated energy savings are 28,000 KWH.

- 30 regular space heaters at 1200 w each = 36,000 w
- 30 seat heaters at 40 w each = 1200 w
- Difference of 34,800 w

- 20 weeks for campaign (Dec 5 to Apr 28) and 5 days per week = 100 days
- 100 days x 8 hrs/day of heater usage = 800 hrs
- 800 hrs x 34,800 w = 27,840,000 w

- $27,840,000/1000 = \underline{27,840 \text{ KWH}}$ savings for the whole campaign

Campaign results: Results exceeded the goals, the Sustainability Office swapped 45 space heaters for electric seat warmers; the program has a 66% satisfaction rating (results from a survey conducted that was answered by 29 respondents from the total 50 users).

Approx. savings are 42,000 KWH.

- 45 regular space heaters at 1200 w each = 54,000 w
- 50 seat heaters at 40 w each = 2000 w
- Difference of 52,000 w

- 20 weeks for campaign (Dec 5 to Apr 28) and 5 days per week = 100 days
- 100 days x 8 hrs/day of heater usage = 800 hrs
- 800 hrs x 52,000 w = 41,600,000 w

- $41,600,000/1000 = \underline{41,600 \text{ KWH}}$ savings for the whole campaign

After the amazing welcoming and the results post campaign, we developed the Space Heater Defeater program, after the success of this program, the Sustainability Office has decided to create the Energy Efficient Heating Devices Library.

The Energy Efficient Heating Devices Library program offers staff and faculty members the opportunity to try out alternative heating devices for their offices. These devices have been carefully selected to provide efficient heating while minimizing energy consumption. The program includes the following devices available for trial:

Seat Heaters: 5 units available

Keyboard Pads: 5 units available

Electric Blankets: 2 units available

Participants will have the opportunity to borrow these devices for a trial period of 2 weeks, during which they can assess their effectiveness and comfort level in their office space. If an employee finds the device(s) comfortable and

beneficial, they may request acquisition for their personal office use to their office managers (upon manager's approval), as these devices are approved by the Sustainability Office

- The TRU Sustainability Office has hosted *TRU Casual Shirt Fridays* since 2016 (nothing happened in 2022 due to Sustainability Office staff shortages). This year's event saved electricity on campus by reducing TRU's electricity consumption used by the air conditioning systems in most campus buildings by turning thermostats down by 0.5 to 1 degree for 8 summer Fridays (July 7 to August 25, 2023) and encouraging campus members to dress for the warmer summer weather by wearing casual shirts.

Typically, changing the temperature by one degree can save 5% of the electrical energy used for cooling, so by simply dressing for warmer weather, the TRU community demonstrates that small actions can make a big difference in saving energy and reducing the impacts of climate change.

Statistics for the event:

Dates	Number of People at Booth	Shirt Theme
July 7th	16	Canada Day
July 14th	12	Thrifty Shirt
July 21st	14	Funny saying on shirt
July 28 th	11	Animal Print
August 4th	13	Hawaiian Shirt
August 11 th	10	Sports Shirt/Jersey
August 18 th	7	TRU Colours
August 25 th	11	Personal Favorite shirt

Total Number of People at Booth: **94**

Average number of people per day: 11.75

Additional Notes:

- The A/C was turned down in most campus buildings by 0.5 degrees for the entire duration of the event: July 7 to Aug 25.
- Most people said it was still too hot in their offices, (possibility to reduce A/C more next year.)
- Handed out Energy Reduction Checklist to encourage people to reduce their energy consumption with typical devices at work and home. (Around 40 given out)
- Extensive social media engagement on Fc and In over the whole 8 weeks.

Other Key Energy Saving Initiatives

- TRU will again participate in *SDG Week Canada* this year (March 4-8, 2024), and roll-out a full week of programming, including a major event (*SDGs & Global Super Snacks*) and other interactive activities for the entire TRU campus community. It will be similar in many respects to last year's successful event.

- TRU Sweater Day (Feb 15, 2024) – This natural gas conservation event has been a popular tradition at TRU since 2012. It engages students, staff, and faculty in a fun and interactive way, while educating the campus community about energy-saving measures both on campus and at home. Participants are encouraged to wear sweaters as the temperature in most campus buildings is lowered by up to 1°C from Feb. 15 to Feb. 18 (with certain buildings exempt from the change). Lowering the thermostat by just a few degrees can reduce energy consumption by approximately 10%. Participation at home is also encouraged—together, we can help lower energy usage and costs!
- TRU SDG Week (March 5-7, 2024) featured a variety of events, including the TRU Repair Café, Green Drinks, and the SDG and Global Super Snacks. Organized by the Sustainability Office, the week was designed as a non-partisan gathering for individuals interested in sustainability issues. It was open to everyone, encouraging conversations and networking among those passionate about sustainability. Given that many of the Sustainable Development Goals (SDGs) are directly or indirectly related to energy, many members of the TRU community engaged in energy conservation and efficiency activities during the event. These conversations aimed to raise awareness about global challenges and inspire participants to reflect on their roles in addressing these issues.

TRU Campus Strategic Sustainability Plan (CSSP)

2020-2025

- In 2012, a TRU student and staff survey revealed a surprisingly low score regarding the TRU community's awareness of sustainability-related activities and initiatives on campus, or even that there is a Sustainability Office. This knowledge helped establish the need for a formal plan to help change the sustainability culture on campus.

In 2013, TRU established “increasing sustainability” as one of its five strategic priorities for 2014-2019. The first Campus Strategic Sustainability Plan (CSSP) (2015-2019 became aligned with the university's strategic plan, and provided a focus for TRU's efforts toward sustainability.

The [new CSSP](#), launched in December 2019, is even more comprehensive in nature than the first plan, and includes more than 130 recommended strategies across four key focus areas: Operations & Planning, Advocacy & Engagement, Learning, and Administration. The CSSP is intended to provide a framework for each TRU department and operational unit to incorporate sustainability initiatives into their own planning processes.

The CSSP is a five-year plan. The majority of the strategies are recommended for implementation over the short term (1-3 years) and medium term (3-5 years); however, the plan includes several strategies for consideration over the longer term (5+ years). These have been included to provide points of reference for longer term planning and resource allocation.

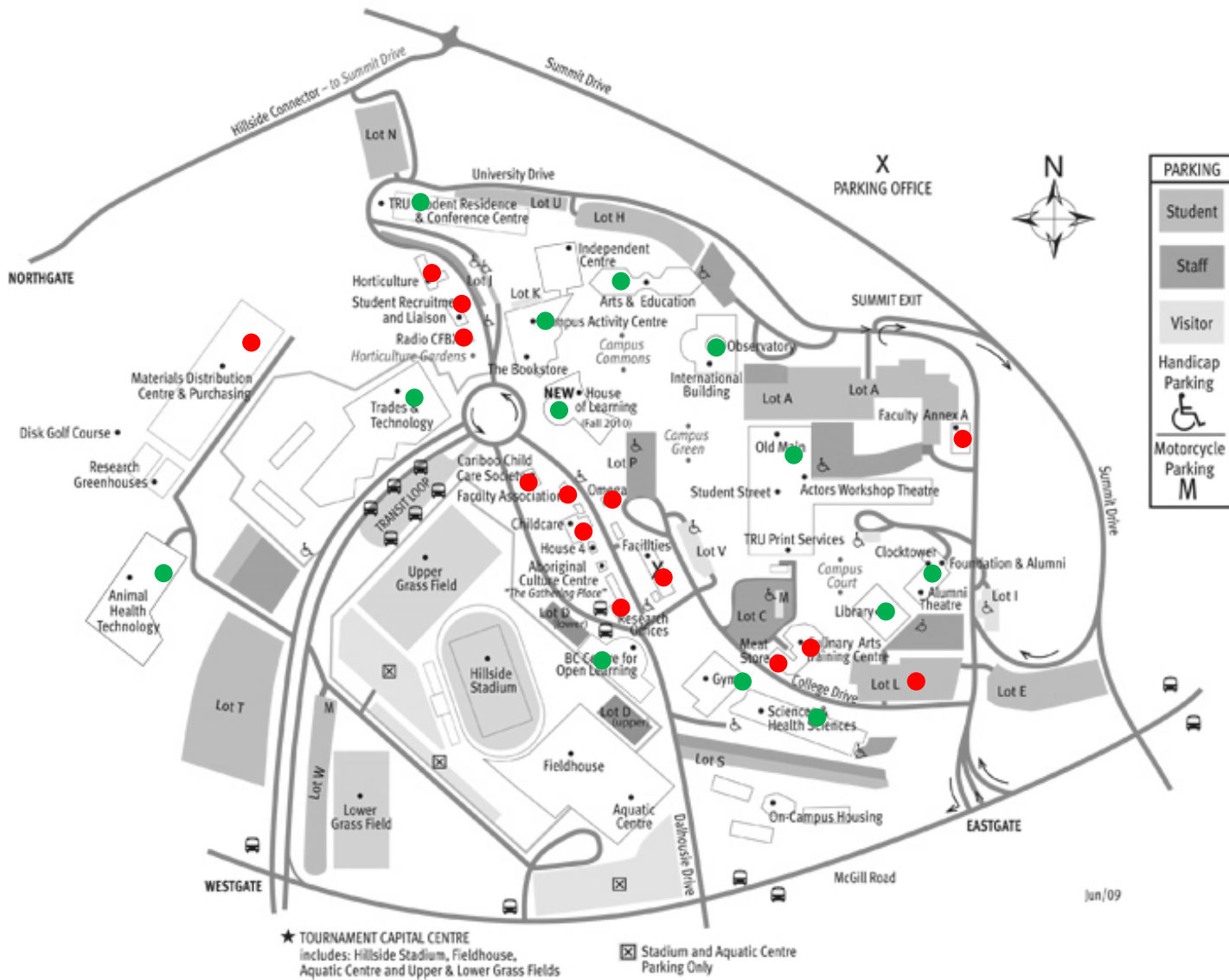
Unlike some strategic documents, the plan takes a comprehensive approach of documenting strategies over the next 5 years. These strategies are not all the

responsibility of one department or office, but rather are shared among many. This comprehensive approach will allow each office or department to see where and how it can play a role in TRU's sustainability journey.

Program	Anticipated Savings (KWH)	Target Audience	Estimated Reach (# people)	Start/End Date
Space Heater Defeater Program	41,600	Staff and faculty	45	Dec 2022 to Mar 2023
TRU Sweater Day 2023	Anticipated Natural Gas savings = 100 gigajoules (GJ); equivalent to approximately 26,000 kWh,	Students, staff and faculty	500	Feb 16 2023
TRU Staff/Faculty Sustainability Ambassadors	TBD	Staff & Faculty	100	Sept 2023 – June 2024
Casual Shirt Fridays (x8 Fridays in 2023)	TBD	Students, Staff and Faculty	1500	Annual (July, August)

Table 13. Sustainability Initiatives (2023/2024 school year and Summer School semester)

Appendix A



TRU Campus Map

Figure 3. TRU Campus Map

- Primary Buildings
- Secondary Buildings

Appendix B

TRU Environmental Sustainability Policy

POLICY

Thompson Rivers University (TRU) is committed to being one of the top universities regarding overall performance in sustainability. As is stated in the TRU Vision Statement, “The focal point of the statement is the Secwépemc word Kw’seltnéws, which means we are all related and interconnected with nature, each other and all things.” Because of this, and in light of the litany of core environmental elements around the world that are threatened, a concerted effort must be made to include sustainability and environmental, social, and economic factors in decision making.

The University is a signatory to the following environmental or sustainability-focused initiatives and, as such, will comply with the spirit and reporting requirements of each one:

- The University and College Presidents’ Climate Statement of Action for Canada (2008).
- Taillores Declaration (2010)
- Race To Zero for Universities and Colleges (‘climate emergency letter’) (2021)
- SDG Accord (2022)

The University has a significant role to play in preserving the local and global environments. TRU seeks to be the University of Choice for students concerned about environmental sustainability and to be recognized for its leadership and stewardship in responding to environmental challenges.

This policy will assist members of the University community to understand and fulfill their responsibilities with respect to environmental sustainability.

REGULATIONS

I. DEFINITIONS

1. Sustainability: Meeting present needs without compromising the needs of future generations.
2. Environment: Surrounding conditions, forces, or influences which affect the natural, built, or human systems.
3. Energy: Energy represents all energy sources on site (electrical, natural gas, diesel, gasoline, propane, and renewable energy sources etc.).
4. ISO 50001: A framework of requirements based on the management system model of continual improvement for organizations to manager their energy use.
5. Energy Management System: A set of procedures that defines how Thompson River University manages its energy performance in accordance with ISO 5000

II. PURPOSE

1. To facilitate and support the University’s mission with respect to Environment and Sustainability as set out in the 5-Year Campus Strategic Sustainability Plan.
2. To establish the process and responsibilities for monitoring sustainability initiatives at the University.
3. To outline the principles through which the environmental and sustainability objectives can be achieved.
4. To outline the roles and responsibilities for implementing Campus Strategic Sustainability Plans, with a focus on the plans’ priorities.

III. PRINCIPLES

1. Leadership in Sustainable Operations

- a. The University will decrease water consumption, waste generation and the use of toxic substances in campus operations. Where substitution, reuse, or recycling cannot be reasonably implemented, best practices will be pursued in the disposal of waste.
- b. The University's procurement processes will consider environmental social, ethical, and economic factors in the purchasing process through the use of such tools as the TRU Purchasing Policy and life cycle costing or similar analysis.
- c. The University will consider biodiversity and the preservation of remaining wild areas of its campuses when deciding about the use and development of campus lands.

2. Leadership in Energy Management

- a. The University is committed to continuously improving energy performance in its facilities and activities, and the Energy Management System, while minimizing its environmental footprint. To achieve this, the University will:
 - i. Establish energy and greenhouse gas targets that are reviewed annually and updated as needed.
 - ii. Ensure employees receive ongoing training in energy management specific to their role within the organization.
 - iii. Maintain an active workplace energy conservation awareness program for all employees.
 - iv. Ensure that all documentation related to energy performance is available to employees based on their specific roles within the organization, including objectives, targets, and operating procedures.
 - v. Ensure all legal and other requirements related to energy efficiency, energy use, and energy consumption are met.
 - vi. Ensure that the procurement of equipment and services that impact energy performance includes consideration for energy efficiency and energy performance improvement.
 - vii. Ensure that the design of new buildings and/or facilities include consideration for energy efficiency and energy performance improvement.
 - viii. Ensure maintenance of BOMA BEST certification for all existing and new buildings
 - ix. Ensure that this Policy is available as documented information, communicated within the organization, and available to interested parties, as appropriate.
- b. The University is committed to aligning its energy management practices with ISO 50001 at the Kamloops Campus. This applies to all Kamloops Campus activities and facilities including buildings and fleet.

3. Leadership in Evaluating Success

- a. The University will continually measure and monitor the impacts of its activities against the principles of sustainability, setting objectives, targets and measuring results in the form of a Campus Strategic Sustainability Action Plan that will be updated every five years.

4. Leadership in TRU Community Sustainability

- a. The University will foster and encourage the development of sustainable practices and activities by the University community on and off campus.
- b. The University will work cooperatively in support of sustainability programs and actions in the communities TRU serves.
- c. The University will work with other universities, colleges, government departments, and organizations to further the objectives of sustainability

5. Leadership in Managing Environmental Risks

- a. The University commits to a process of continual environmental improvement and best practices.
- b. The University commits to reviewing and updating this Policy every three years.
- c. The University will disseminate knowledge regarding sustainability to the community at large.
- d. Due to the obvious and long-term effects that climate change will foreseeably pose to the University, the Vice-President Administration and Finance or designate will conduct an assessment of the possible risks to the University every three years in conjunction with the review of this policy.

IV. RESPONSIBILITIES FOR IMPLEMENTATION

- 1. The Vice-President, Administration and Finance is responsible for reviewing the Campus Strategic Sustainability Plan and for approving actions, schedules, and funding for its implementation. Information from the Plan will be compiled and published in the Environmental Advisory Committee's reports to the TRU Board of Governors and Senate as needed.
- 2. The Manager of Sustainability Programs is responsible for co-ordination, advocacy, and communication of the sustainability principles, objectives, targets, and activities on campus. They will also support TRU's sustainability actions within the broader community, government departments and other organizations and universities.
- 3. The Manager of Sustainability Programs is responsible for regulatory reporting.
- 4. The Energy Manager is responsible for energy management.

Appendix C

Description of Measure	Standard LCE Measure name (Use drop down)	New or Retrofit	Electrical Consumption (kWh/yr)	Average Monthly Demand (kW)			Nat Gas Consumption (GJ/yr)		GHG Reduction	Annual Cost Saving \$							Total Capital Cost	Incremental relative to Baseline	Non Energy Benefits (eg thermal comfort, noise reduction, air quality etc.)	Measured Life/Performance	Payback		
				Current	Incremental (+/-)	Months	Current	Incremental (+/-)		Tonnes CO2e/yr	Electric	Demand	Gas	Maintenance or others savings (annual)	GHG Offsetting Costs	TOTAL						\$	\$
Electric Boilers at TTC																							
LCE Study at UCH	HVAC Elect New									-	-	-	-		-	\$ -		\$ -			20 -		
LCE Study at UCH	HVAC Air S Retrofit		200,000							2	\$ 11,120	-	-		-	\$ 11,120		\$ -			18	0.0	
LCE Study at UCH	DHW Air-tc Retrofit		42,176							0	\$ 2,345	-	-		-	\$ 2,345		\$ -			15	0.0	
LCE Study Kamloops campus																							
Electric Boilers at NPH	HVAC Elect Retrofit		10000000							107	#####	-	-		-	#####		\$ -			20	0.0	
LCE at UCH (replace furnaces)	HVAC Elect New									-	-	-	-		-	\$ -		\$ -			20 -		
LCE at UCH																							
LCE at UCH	HVAC Air-t Retrofit		170,067							-101	\$ 9,456	\$ -	\$ -		-	\$ 2,529	\$ -8,416	\$ -			18	0.0	
LCE at UCH (install heat pump)																							
LCE at UCH	HVAC Air-t Retrofit		105522							-1176													
LCE at UCH (install DHW heat pump)																							
DHW heat																							
DHW heat	DHW Air-tc Retrofit		127660							-2142	-105	\$ 7,098	\$ -	\$ -15,915		\$ 2,636	\$ 11,454	\$ -	\$ -		15	0.0	