The following Motions and Documents were considered by the Board Finance and Property Committee at its Tuesday, June 2, 2015 meeting:

Agenda Title: **Changes to Creation of a Legal Entity Policy**

APPROVED MOTION: THAT the Board Finance and Property Committee recommend that the Board of Governors approve the proposed changes to the Creation of a Legal Entity Policy, as set forth in Attachment 1, to take effect upon final approval.

Final recommended item: 5

Agenda Title: ***Envision*** **Year 3 – Capital Expenditure Authorization Request**

APPROVED MOTION: THAT the Board Finance and Property Committee recommend that the Board of Governors approve the University's third year of the five-year Envision energy management program and a capital expenditure of not more than Nine Million Dollars ($9,000,000.00) in Canadian funds to implement the third year of the program.

Final recommended item: 6

Agenda Title: ***Envision*** **Year 3 – Borrowing Resolution and Order in Council**

APPROVED MOTION: THAT the Board Finance and Property Committee recommend that the Board of Governors:

a) execute a Borrowing Resolution requesting approval of financing the third year of the five-year Envision energy management program in an amount not to exceed Nine Million Dollars ($9,000,000.00) in Canadian funds for a term not to exceed fifteen (15) years at an interest rate of not more than five and one-half percent (5.5%); and

b) make an application to the Minister of Innovation and Advanced Education for the required approval of the Lieutenant Governor in Council.

Final recommended item: 7

Agenda Title: **Anderson Lands – Disposition of Land**

APPROVED MOTION: THAT the Board Finance and Property Committee, acting with delegated authority of the Board of Governors, approve, on terms and conditions acceptable to the Vice-President (Facilities and Operations), the disposition of:

- property legally described as the SW Quarter of Section 21, Township 28, Range 5, West of the 4th Meridian, located in eastern Alberta (approximately 6 miles east of Cereal, Alberta) containing approximately 155 acres of land which are surplus to the needs of the University of Alberta.

Final approved item: 8

OUTLINE OF ISSUE

Agenda Title: **Changes to Creation of a Legal Entity Policy**

Motion: THAT the Board Finance and Property Committee recommend that the Board of Governors approve the proposed changes to the Creation of a Legal Entity Policy, as set forth in Attachment 1, to take effect upon final approval.

Item

Action Requested	☐Approval ☒Recommendation ☐Discussion/Advice ☐Information
Proposed by	Office of General Counsel
Presenter	Brad Hamdon, General Counsel
Subject	Proposed Amendment to the Creation of a Legal Entity Policy

Details

Responsibility	General Counsel
The Purpose of the Proposal is (please be specific)	The Creation of a Legal Entity Policy was put in place to ensure appropriate processes are followed when the University is considering creating or acquiring an interest in a legal entity. However, it was not intended that the Policy would apply in certain circumstances, such as when the University is gifted shares in a company. This revision clarifies such exceptions.
The Impact of the Proposal is	Update to an existing policy.
Replaces/Revises (eg, policies, resolutions)	Revise the Creation of a Legal Entity Policy
Timeline/Implementation Date	Implementation date would be upon approval by the Board of Governors.
Estimated Cost	N/A
Sources of Funding	N/A
Notes	N/A

Alignment/Compliance

Alignment with Guiding Documents	Dare to Discover, Dare to Deliver
Compliance with Legislation, Policy and/or Procedure Relevant to the Proposal (please quote legislation and include identifying section numbers)	**1. *Post Secondary Learning Act* (PSLA), Section 59 (1):** "A board has the capacity and, subject to this Act, the rights, powers and privileges of a natural person." **2. *Post Secondary Learning Act* (PSLA), Section 60 (1):** "The board of a public post-secondary institution shall (a) manage and operate the public post-secondary institution in accordance with its mandate;" **3. *Post Secondary Learning Act* (PSLA), Section 77 (a):** "A board must obtain the approval of the Minister for (a) an incorporation; (b) the acquisition of a subsidiary corporation either directly or indirectly through the acquisition of a majority of shares in the corporation;" **Board Finance and Property Committee Terms of Reference** 3) MANDATE OF THE COMMITTEE Except as provided in paragraph 4 and in the Board's General Committee Terms of Reference, the Committee shall monitor, evaluate, advise and make decisions on behalf of the Board with respect to all

	strategic and significant financial and property matters and policies of the University. The Committee shall also consider any other matter delegated to the Committee by the Board. 4. LIMITATIONS ON DELEGATION BY THE BOARD The general delegation of authority by the Board to the Committee shall be limited as set out in this paragraph. Notwithstanding the general delegation of authority to the Committee set out in paragraph 3, the Board shall: f) approve policies regarding the acquisition, management, control and disposition of University buildings, land and equipment and regarding individual project proposals and the implications of these short and long-range capital plans to the strategic vision of the University;

Routing (Include meeting dates)

Consultative Route (parties who have seen the proposal and in what capacity)	Office of Vice-President (Advancement); Director, Investments & Treasury
Approval Route (Governance) (including meeting dates)	President's Executive Committee – Operating (PEC-O) – May 14, 2015 Board Finance & Property Committee – June 2, 2015
Final Approver	Board of Governors

Attachments:

1. Creation of a Legal Entity Policy (red-line version) (2 pages)
2. Creation of a Legal Entity Policy (clean version) (2 pages)

Prepared by: Brad Hamdon, General Counsel – brad.hamdon@ualberta.ca

Revised: 5/26/2015

Approval Date: June 25, 2010

Creation of a Legal Entity Policy

Office of Accountability:	Vice-President (Finance and Administration)
Office of Administrative Responsibility:	Vice-President (Finance and Administration) and the Office of General Counsel
Approver:	Board of Governors
Scope:	Compliance with University policy extends to all members of the University community.

Overview

On occasion, it may be in the best interests of the University to become involved in the creation of a **legal entity.** On those occasions, the University must ensure that appropriate processes are in place to safeguard against risks and liabilities that can arise from the creation of a legal entity.

The University has in place the Centres and Institutes Policy and its underlying procedures. That policy and those procedures outline a process to be followed when establishing an academic or affiliated centre or institute (as defined in that policy). As a result, the Creation of a Legal Entity Policy does not apply to academic or affiliated centres or institutes.

The approvals contemplated under this policy are separate from the authorities granted under the Contract Review and Signing Authority Policy. That policy must be referred to when determining authority for the execution of any contract created as a result of the creation of a legal entity.

Purpose

This policy outlines the processes that must be followed and the approvals that must be obtained prior to the University becoming involved in the creation of a legal entity.

POLICY

The University's participation in the creation of a legal entity must be done in accordance with the terms of the *Post-Secondary Learning Act* of Alberta, this policy and the Creation of Legal Entity Procedure, and other applicable legislation and University of Alberta policies and procedures.

Prior to the University participating in the creation of a legal entity, it must undertake appropriate due diligence to ensure that it has an understanding of the legal, financial and other issues associated with its involvement in the legal entity.

This policy does not apply to the University:

a) increasing an existing ownership interest in a legal entity; however, the policy does apply to the University obtaining a new ownership interest in an existing legal entity;
b) obtaining an ownership interest in a legal entity through the investment activities covered by the University Funds Investment Policy;
c) accepting donated securities that are subject to the Donation Acceptance Policy;
d) establishing an academic or affiliated centre or institute under the Centres and Institutes Policy; or
e) obtaining an interest in a spin-off company created under the mandate of TEC Edmonton or otherwise pursuant to the University's Patent Policy.

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DEFINITIONS

Any definitions listed in the following table apply to this document only with no implied or intended institution-wide use. **[▲Top]**	
Legal Entity	Includes a corporation, partnership, joint venture or other similar structure, whether or not controlled by the University. ~~The term legal entity does not include an academic or affiliated centre or institute under the Centres and Institutes Policy, nor does it include a spin-off company created under the mandate of TEC Edmonton or otherwise pursuant to the University's Patent Policy.~~

RELATED LINKS

Should a link fail, please contact uappol@ualberta.ca. **[▲Top]**

Centres and Institutes Policy (UAPPOL)

Contract Review and Signing Authority Policy (UAPPOL)

Creation of Legal Entity – Areas for Consideration (University of Alberta)

PUBLISHED PROCEDURES OF THIS POLICY

Creation of a Legal Entity Procedure

Approval Date: June 25, 2010

Creation of a Legal Entity Policy

Office of Accountability:	Vice-President (Finance and Administration)
Office of Administrative Responsibility:	Vice-President (Finance and Administration) and the Office of General Counsel
Approver:	Board of Governors
Scope:	Compliance with University policy extends to all members of the University community.

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RELATED LINKS

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Centres and Institutes Policy (UAPPOL)

Contract Review and Signing Authority Policy (UAPPOL)

Creation of Legal Entity – Areas for Consideration (University of Alberta)

PUBLISHED PROCEDURES OF THIS POLICY

Creation of a Legal Entity Procedure

OUTLINE OF ISSUE

Agenda Title: ***Envision*** **Year 3 – Capital Expenditure Authorization Request**

Motion: THAT the Board Finance and Property Committee recommend that the Board of Governors approve the University's third year of the five-year *Envision* energy management program and a capital expenditure of not more than Nine Million Dollars ($9,000,000.00) in Canadian funds to implement the third year of the program.

Item

Action Requested	☐Approval ☒Recommendation ☐Discussion/Advice ☐Information
Proposed by	Don Hickey, Vice-President (Facilities and Operations)
Presenter	Don Hickey, Vice-President (Facilities and Operations)
Subject	*Envision* Year 3 and Capital Expenditure Authorization Request Approval

Details

Responsibility	Facilities and Operations
The Purpose of the Proposal is (please be specific)	To obtain approval to proceed with the third year of the five-year *Envision* energy management program and approval of a capital expenditure of not more than Nine Million Dollars ($9,000,000.00) in Canadian funds to implement the third year of the program.
The Impact of the Proposal is	Allows completion of the third year of the *Envision* energy management program to achieve energy savings. Other benefits achieved are: reduced operating and maintenance costs; improved space conditions; infrastructure renewal to address deferred maintenance; reduction of greenhouse gas emissions; and support of and commitment to sustainable development.
Replaces/Revises (eg, policies, resolutions)	N/A
Timeline/Implementation Date	April 2015 – March 2016
Estimated Cost	$9,000,000.00
Sources of Funding	Borrowing of $9,000,000.00 from the Alberta Capital Finance Authority with payback from the energy savings.
Notes	▪ An Energy Management Program has existed at the University of Alberta since the mid 1970s, resulting in an accumulated cost avoidance of $319,980,000.00 since its inception, and an annual cost avoidance of $16,870,197.00 in 2013/2014. ▪ The University has completed the final year of its previous seven-year, $25,000,000.00 Energy Management Program, which is anticipated to save approximately $3,900,000.00 in energy costs annually assisting the Institution to deal with Institutional and Government budget cuts on a go-forward basis. ▪ Notwithstanding the university's past success, significant energy reduction opportunities remain and a continued energy reduction implementation is warranted to keep our energy bill as low as cost-effectively feasible. ▪ Parallel to the execution of the previous seven-year program, a Next Generation five-year $35,000,000.00 Energy Management Program was developed. On November 26, 2013 the Board Finance and Property Committee approved the Next Generation Program and the expenditure of $5,000,000.00 for implementation of the second year of the program. ▪ Annual savings at the completion of the Next Generation Program,

	rebranded under the name *Envision,* are estimated to be approximately $3,800,000.00 with CO_2 emission reductions anticipated to be approximately 30,000 tonnes. ▪ Other benefits that would result are: reduced operating and maintenance costs; improved space conditions; infrastructure renewal to address deferred maintenance; reduced demand on utility plant and distribution infrastructure; reduced environmental impact; and a continued demonstration of our commitment to sustainability. ▪ The university's energy efficiency actions align with the strategic direction of the university and contribute to city-wide, regional, provincial and national efforts to reduce the impact of greenhouse gas emissions on the global climate. ▪ The first year of the *Envision* program is currently nearing completion and the second year is in implementation. ▪ As in the previous seven-year Energy Management Program and in the first two years of the *Envision* program, it is proposed that the third year of the program be financed through borrowing from the Alberta Capital Finance Authority over a fifteen-year amortization period with payback from the energy savings.

Alignment/Compliance

Alignment with Guiding Documents	Dare to Deliver; Comprehensive Institutional Plan
Compliance with Legislation, Policy and/or Procedure Relevant to the Proposal (please quote legislation and include identifying section numbers)	PSLA, Section 60 (1)(b) refers: *The Board of a public post-secondary institution shall develop, manage and operate, alone or in co-operation with any person or organization, programs, services and facilities for the educational or cultural advancement of the people of Alberta* PSLA, Section 72 (1)(2) and (3) refers: *Borrowing* *72* ***(1)*** *A board may borrow from any bank or treasury branch or from any other person any sum of money required to meet the expenses of the public post-secondary institution until the time the revenues for the current year are available.* ***(2)*** *Any borrowings made pursuant to subsection (1) must be repaid out of and are a first charge on the revenues of the current year, and may be secured by a promissory note or notes given on behalf of the board in any manner the board may arrange.* ***(3)*** *Subject to the approval of the Minister, a board may for the purposes of the public post-secondary institution, as defined in section 73, borrow by way of temporary loans from any bank or treasury branch or from any other person any sums of money on any terms that the board determines, by way of an overdraft or line of credit or by the pledging as security for the temporary loans of notes, bonds, debentures or other securities of the board pending the sale of them, or instead of selling them, or in any other manner the board determines.* BFPC Terms of Reference, Section 3 (g) states: *3. MANDATE OF THE COMMITTEE* *Except as provided in paragraph 4 and in the Board's General Committee Terms of Reference, the Committee shall monitor, evaluate, advise and make decisions on behalf of the Board with respect to all strategic and significant financial and property matters and policies of the University. The Committee shall also consider any other matter delegated to the Committee by the Board.* *Without limiting the generality of the foregoing, the Committee shall:* *g) review and recommend to the Board original Capital Expenditure Authorization Requests or individual Supplemental CEARs greater than $7 million or aggregate total CEAR and Supplemental CEARs up to, but not exceeding $14 million.*

	4. LIMITATIONS ON DELEGATION BY THE BOARD *The general delegation of authority by the Board to the Committee shall be limited as set out in this paragraph. Notwithstanding the general delegation of authority to the Committee set out in paragraph 3, the Board shall:* *(c) approve capital expenditures of more than $7 million or expenditures which, when combined with other expenditures for the same project, would equal more than $7 million;*

Routing (Include meeting dates)

Consultative Route (parties who have seen the proposal and in what capacity)	▪ Associate Vice-President, Operations and Maintenance, Facilities and Operations ▪ Vice-President, Facilities and Operations ▪ President's Executive Committee – Operational – May 7, 2015
Approval Route (Governance) (including meeting dates)	Board Finance and Property Committee – June 2, 2015 Board of Governors – June 19, 2015
Final Approver	Board of Governors

Attachments:

1. Document titled, *Envision* Year 3*, 2015-2016*, dated April 1, 2015 (11 pages)

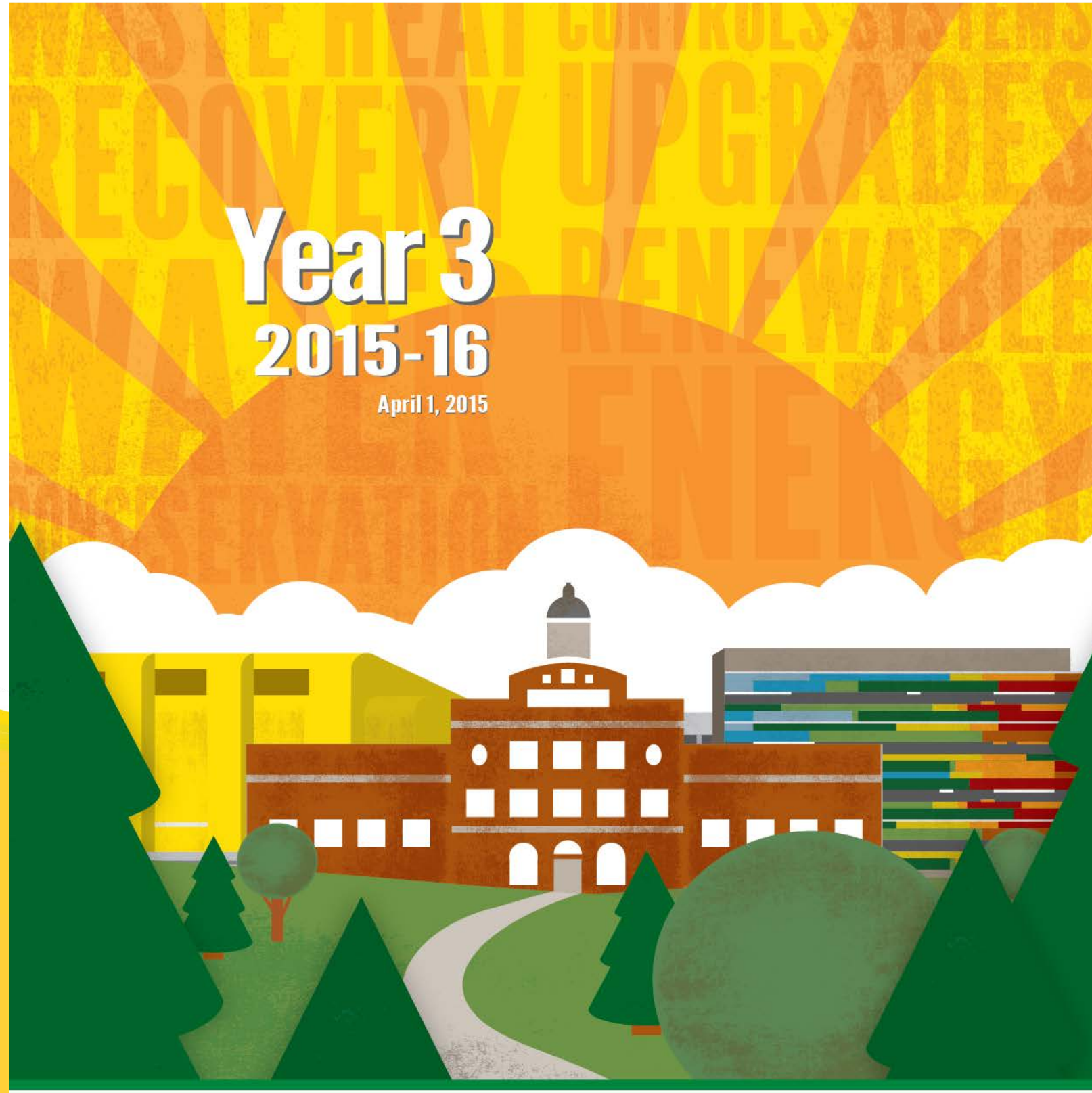
Prepared by:
Michael Versteege, Manager
Energy Management & Sustainable Operations
4th Floor General Services Building
Phone: 780-492-4024
Email: mike.versteege@ualberta.ca

Revised: 5/26/2015

UNIVERSITY OF ALBERTA
FACILITIES AND OPERATIONS

ENvision

INTELLIGENT ENERGY REDUCTION



Year 3
2015-16

April 1, 2015

UNIVERSITY OF ALBERTA
FACILITIES AND OPERATIONS

Table of Contents

A very successful Energy Management Program has been in place at the University of Alberta since the mid-1970s. The University's program resulted in an annual cost avoidance of $16,870,197 in 20013/2014, with an accumulated cost avoidance in excess of $319,980,000 achieved since its inception in 1975/1976. While building area has increased 74% since 1975/76, utility consumption per square metre has decreased. Utility consumption per square metre for electricity and steam would be 33% and 49% higher respectively had energy conservation measures not been implemented. As well the program has resulted in a cumulative emissions reduction in excess of 2,300,000 tonnes of CO_2.

The University is currently implementing a Next Generation Energy Management Program that was developed in the spring of 2011, and subsequently rebranded under the name *Envision,* which identified the potential for $35,000,000 of energy management implementations phased over a 7-year period ($5 million/year). Annual savings at the completion of the 7-year program are estimated to be in the order of $3,800,000 and CO_2 emission reductions are anticipated to be in the order of 30,000 tonnes.

Board of Governors have approved the current seven year $35,000,000 program based on an approach of $5,000.000 per year borrowing over seven years. Currently we are in the implementation of the first and second years of the program borrowing of $10,000,000 from the Alberta Capital Finance Authority to finance. Preliminary audits and feasibility studies for years three through seven have identified new technologies that have the potential to provide significant energy savings savings for the institution. These are: demand based laboratory ventilation; occupancy based space ventilation; and energy analytics.

To quickly realize the benefits of these new technologies and the low cost of borrowing it is recommended that the current program be accelerated from a seven year program to a five year program with borrowing of $9,000,000 to implement the third year of the *Envision* program, and with subsequent borrowing of $8,000,000 for each of the following two years of implementation.

Continued implementation of the *Envision* program and these new technologies and opportunities is warranted to keep our energy bill as low as cost effectively feasible. Other benefits that would also result are reduced operating and maintenance costs, improved space conditions, infrastructure renewal to address deferred maintenance, reduced demand on utility plant and distribution infrastructure, and significant environmental benefits. Implementation of the *Envision* program also further demonstrates the University's solid and on-going actions and commitment to sustainability. Actions taken by the University of Alberta to improve energy efficiency align with the strategic direction of the University and contribute to city-wide, regional, provincial and national efforts to reduce the impact of greenhouse gas emissions on the global climate.

As indicated above, a number of new technologies and opportunities have recently presented themselves that were not anticipated in the initial development of the current program. These are:

- Demand based laboratory ventilation
- Occupancy based space ventilation
- Energy analytics

Each of these initiatives, outlined briefly below, is expected to significantly reduce the University's energy consumption, energy intensity, greenhouse gas emissions, and utility costs.

Demand Based Laboratory Ventilation Control

Laboratory environments consume significant amounts of energy typically exchanging air at 8-10 times an hour with 100% outside air, often 24 hours a day, 7 days a week, and typically consume twice the amount of energy as an office/classroom space. In addition to the energy required to supply and exhaust large quantities of air, significant amounts of energy are expended to heat or cool, and condition this air.

Demand based laboratory ventilation control technology is an integrated sensing, control, and optimization solution that cost-effectively reduces building energy and operating expenses while simultaneously maintaining indoor environmental quality.

The proper amount of ventilation needed is based on continuous monitoring and analysis of the air within the facility for airborne contaminants. Sensed parameters include total volatile organic compounds (TVOCs), particulates, carbon dioxide, carbon monoxide, temperature, and dew point temperature.

Through real time sensing and continuous analysis of indoor environments the system dynamically reduces air change rates when the air is clean which is typically the majority of time, saving vast amounts of energy, but dynamically raises the rates as required to maintain indoor environmental quality when pollutants are sensed.

The continuous monitoring and analysis process inherent in the technology also facilitates real time commissioning that allows system degradation to be easily observed and corrected, maintaining long term energy savings. Actionable system information that helps to quickly address issues when they arise results in better management of the facility, tracking of airside energy use, and improvement in lab management and safety.

Occupancy Based Space Ventilation

Occupancy based space ventilation is an occupancy counting technology that determines real-time space occupancy levels and through integration with the building automation system triggers real-time and dynamic control of the space ventilation systems.

Fan operation, fan speed, levels of ventilation and fresh air are based on the space being occupied and only on the actual numbers of occupants in the space, versus ventilating spaces that may be unoccupied or to levels required for the maximum potential number of occupants. This results in reduced fan power requirements, and reduced energy to heat or cool fresh air.

Capturing occupancy trends across a day/week/ month allows operations staff to better understand actual space utilization and to optimize ventilation system operation and implement energy efficient strategies.

Implementation of occupancy based space ventilation technology results in reduced energy consumption, better air quality and occupant comfort, reduced operating and maintenance costs, and reduced impact on the environment.

Energy Analytics

The objective of energy analytics is to develop a long term strategy for energy cost reduction as a result of improvements in energy and operational efficiency of heating, ventilating, and air-conditioning (HVAC) systems, and improvements in facility management through the implementation of an Enterprise Energy Information Management System (EEIMS) solution.

The EEIMS directly or indirectly interfaces with and consolidates various real-time and historical energy related data sources (e.g. energy consumption, costs, building automation system information, control and monitoring points) into a data warehouse, analyzes and normalizes the data for subsequent processing, develops a common database and provides a platform for analytics tools to easily access the data and obtain actionable information.

This information is categorized, stored and analyzed to provide a series of functions that include energy usage history, benchmarking, recognition of anomalies, display on dashboards, fault diagnostics and detection.

The EEIMS makes data-driven information, analytics, tools and resources available so that facility engineering, maintenance, and operations staff are able to perform in-depth diagnostics, engineering analysis, and monitoring to develop actionable strategies in a small fraction of the time it took with earlier methods.

The goal is to gain a better understanding of the real-time and historical trending through use of rule-based engines and analytics tools that can define key areas of improvement. It is anticipated that improvements will fall into multiple categories including:

- Scheduling improvements
- System optimizations
- Energy load shedding, and/or shifting strategies
- Maintenance process improvements including deferred maintenance, predictive maintenance versus scheduled maintenance
- Predicting energy cost deviations versus usage
- Identifying usage patterns, anomalies, and identifying system process adjustments for greater optimization

Analytics, continuous commissioning, fault detection and diagnostic software-based tools will monitor the operation of building HVAC systems and identify potential performance problems for corrective action.

The EEIMS will help to identify areas to improve energy and operational efficiency, enhance operational and management effectiveness, improve building performance, save energy, reduce environmental footprint, systematically improve comfort, lower maintenance costs, measure & verify results, and allow deployment of internal and external maintenance and operations resources in a proactive and efficient manner.

The following projects comprise Year One of the *Envision* program:

Augustana Residence Lighting Retrofit
Camrose Performing Arts Centre (CPAC) Energy Efficiencies and Renewable Energy
PAW Centre Energy Efficiencies and Renewable Energy
Katz Demand Based Laboratory Ventilation
South Academic Building Window Replacement
Car Park Lighting Retrofits (Educ, ECERF, Timms/Telus, Southfield, Stadium, Windsor)

The Car Park lighting retrofit projects are currently in the design phase. All other projects are complete.

The above projects are on track with the $5,000,000 budget for year one and with payback within 15 years.

The following projects comprise Year Two of the *Envision* program:

CCIS Demand Based Laboratory Ventilation
Agri-Food Discovery Demand Based Laboratory Ventilation
Li-Ka Shing Demand Based Laboratory Ventilation
NREF Demand Based Laboratory Ventilation
ECV Infill Residences Energy Efficiency Measures
Peter Lougheed Leadership College Energy Efficiency Measures
RTF Lighting Retrofit

The CCIS, Li-Ka Shing, and RTF projects are complete. The ECV Infill Residences and the Peter Lougheed Leadership College projects are currently under construction. The Agri-Food Discovery and NREF demand based laboratory ventilation projects are currently in the design phase.

The above projects are on track with the $5,000,000 budget for year two and with payback within 15 years.

Preliminary assessment and early project identification has been conducted for the third year of the *Envision* program. The following projects have been identified and are currently being further investigated and developed:

Agriculture Forestry - Demand Based Laboratory Ventilation
Earth Sciences - Demand Based Laboratory Ventilation
Energy Analytics Implementations
Occupancy Based Space Ventilation Implementations
Waste to Energy High Solids Anaerobic Digester Facility (HSADF)
Campus Saint-Jean – Solar PV, Solar Thermal
Cameron Library – Energy Efficiency, Solar PV, Micro Steam Turbine Generator
Pump System VSD's and Controls - Medical Sci, Bio Sci, Agriculture Forestry
Domestic Water Reduction – General Services Building
Chemistry Complex – Demand Based Laboratory Ventilation

Based on the analysis to date, the estimated cost for implementation of Year 3 of the *Envision* program is $9,000,000. Average annual energy savings from this implementation over the fifteen-year period is estimated in the order of $1,054,048. Based on Utility forecasts to 2018/19 and a 1.5% escalation thereafter, payback of the third year of the program occurs within a fifteen year period. As in the previous energy management programs, it is proposed that these projects be financed through borrowing from the Alberta Capital Finance Authority over a fifteen-year amortization period.

Financial feasibility is checked through each stage of development of a project (preliminary feasibility, detailed audit, preliminary design, detailed design, and tender) with project costs and energy savings refined at each stage of the process to confirm viability. Projects are modified if necessary during the various development stages to maintain feasibility. As well, the annual programs and the program as a whole are reviewed on an on-going basis to confirm viability.

Following is the financial analysis for the third year of the *Envision* program and the cash flow projection and payment schedule that would be required to service a $9,000,000 loan over a fifteen-year term, modeled at an interest rate of 5.5%. *(The lending rate from the Alberta Capital Finance Authority (ACFA) as of March 15, 2015, is 2.235% per annum for a fifteen-year amortization period.)*

To establish an upper limit for borrowing purposes, an analysis and cash flow projection was also performed to determine the effect if inflationary pressures caused interest rates to rise above the 5.5% used in the model, with concurrent inflation/escalation on the utility rates. The fifteen-year amortization financial model can support interest rate increases up to 7% with 1.5% escalation in utility rates.

The savings are based on the University of Alberta Utilities Department electricity and steam cost forecasts to 2018/19 with a 1.5% per year increase in utility rates thereafter.

The internal rate of return (IRR) for the third year of the *Envision* program with an economic life of twenty-five years is 10.93%. The net present value (NPV)[1] with a fifteen year amortization period, 4% opportunity cost of capital, and 7% assumed financing cost is $6,265,223. The 10.93% IRR[2] is well above the opportunity cost of capital at 4%, and the NPV is positive, which would indicate good project viability for Year-3 of the program.

[1] NPV is the value of the monetary impact of the project in terms of today's dollars, i.e. if all future cash flows are discounted into today's dollars, and the cost of the project is subtracted, this will give a NPV total. If the total is positive the project is deemed as acceptable, if negative it is not. For this analysis, an opportunity cost of capital of 4% was used and financing costs were assumed to be 7.0%.

[2] IRR is a measure of the interest yield on a project over its useful life. As long as the IRR is greater than the opportunity cost of capital (4.0%), the project is deemed acceptable.

Projected Cash Flow, Loan Payment, and Savings Schedule
15 Year Amortization Period, 5.5% Interest Model

Fiscal Year	Project Expense	Energy Savings	ACFA Loan Payment	Principal	Loan Interest 5.5%	ACFA Loan Balance	Net Cumulative Cash Flow
Apr-15	$40,000						-$40,000
May-15	$40,000						-$80,000
Jun-15	$100,000						-$180,000
Jul-15	$280,000						-$460,000
Aug-15	$380,000						-$840,000
Sep-15	$980,000						-$1,820,000
Oct-15	$1,340,000						-$3,160,000
Nov-15	$1,380,000						-$4,540,000
Dec-15	$1,160,000						-$5,700,000
Jan-16	$1,120,000						-$6,820,000
Feb-16	$1,100,000						-$7,920,000
Mar-16	$1,080,000		$9,000,000				$0
2015/16		$990,000	($896,630)	$401,630	$495,000	$8,598,370	$93,370
2016/17		$1,051,441	($896,630)	$423,720	$472,910	$8,174,650	$248,181
2017/18		$973,991	($896,630)	$447,025	$449,606	$7,727,625	$325,541
2018/19		$981,143	($896,630)	$471,611	$425,019	$7,256,014	$410,054
2019/20	1.5%	$995,860	($896,630)	$497,550	$399,081	$6,758,464	$509,283
2020/21		$1,010,798	($896,630)	$524,915	$371,716	$6,233,549	$623,451
2021/22		$1,025,960	($896,630)	$553,785	$342,845	$5,679,764	$752,780
2022/23		$1,041,349	($896,630)	$584,243	$312,387	$5,095,521	$897,499
2023/24		$1,056,969	($896,630)	$616,377	$280,254	$4,479,144	$1,057,838
2024/25		$1,072,824	($896,630)	$650,277	$246,353	$3,828,867	$1,234,031
2025/26		$1,088,916	($896,630)	$686,043	$210,588	$3,142,824	$1,426,317
2026/27		$1,105,250	($896,630)	$723,775	$172,855	$2,419,049	$1,634,937
2027/28		$1,121,829	($896,630)	$763,583	$133,048	$1,655,466	$1,860,135
2028/29		$1,138,656	($896,630)	$805,580	$91,051	$849,887	$2,102,161
2029/30		$1,155,736	($896,630)	$849,887	$46,744	$0	$2,361,267
2030/31		$1,173,072		$0	$0	$0	$3,534,339
2031/32		$1,190,668		$0	$0	$0	$4,725,007
2032/33		$1,208,528		$0	$0	$0	$5,933,535
2033/34		$1,226,656		$0	$0	$0	$7,160,191
2034/35		$1,245,056		$0	$0	$0	$8,405,247
2035/36		$1,263,732		$0	$0	$0	$9,668,979
2036/37		$1,282,688		$0	$0	$0	$10,951,667
2037/38		$1,301,928		$0	$0	$0	$12,253,595
2038/39		$1,321,457		$0	$0	$0	$13,575,052
2039/40		$1,341,279		$0	$0	$0	$14,916,331
TOTAL		**$28,365,786**	**($13,449,456)**	**$9,000,000**	**$4,449,456**		**$14,916,330**

Projected Cash Flow, Loan Payment, and Savings Schedule

(to establish upper limit of borrowing)

15 Year Amortization Period, 7.0% Interest Model

Fiscal Year	Project Expense	Energy Savings	ACFA Loan Payment	Principal	Loan Interest 7.0%	ACFA Loan Balance	Net Cumulative Cash Flow
Apr-15	$40,000						-$40,000
May-15	$40,000						-$80,000
Jun-15	$100,000						-$180,000
Jul-15	$280,000						-$460,000
Aug-15	$380,000						-$840,000
Sep-15	$980,000						-$1,820,000
Oct-15	$1,340,000						-$3,160,000
Nov-15	$1,380,000						-$4,540,000
Dec-15	$1,160,000						-$5,700,000
Jan-16	$1,120,000						-$6,820,000
Feb-16	$1,100,000						-$7,920,000
Mar-16	$1,080,000		$9,000,000				$0
2015/16		$990,000	($988,152)	$358,152	$630,000	$8,641,848	$1,848
2016/17		$1,051,441	($988,152)	$383,222	$604,929	$8,258,626	$65,138
2017/18		$973,991	($988,152)	$410,048	$578,104	$7,848,578	$50,978
2018/19		$981,143	($988,152)	$438,751	$549,400	$7,409,827	$43,969
2019/20	1.5%	$995,860	($988,152)	$469,464	$518,688	$6,940,363	$51,677
2020/21		$1,010,798	($988,152)	$502,326	$485,825	$6,438,037	$74,323
2021/22		$1,025,960	($988,152)	$537,489	$450,663	$5,900,548	$112,131
2022/23		$1,041,349	($988,152)	$575,113	$413,038	$5,325,435	$165,329
2023/24		$1,056,969	($988,152)	$615,371	$372,780	$4,710,064	$234,147
2024/25		$1,072,824	($988,152)	$658,447	$329,704	$4,051,617	$318,819
2025/26		$1,088,916	($988,152)	$704,538	$283,613	$3,347,078	$419,583
2026/27		$1,105,250	($988,152)	$753,856	$234,295	$2,593,222	$536,682
2027/28		$1,121,829	($988,152)	$806,626	$181,526	$1,786,596	$670,359
2028/29		$1,138,656	($988,152)	$863,090	$125,062	$923,506	$820,864
2029/30		$1,155,736	($988,152)	$923,506	$64,645	$0	$988,448
2030/31		$1,173,072		$0	$0	$0	$2,161,520
2031/32		$1,190,668		$0	$0	$0	$3,352,188
2032/33		$1,208,528		$0	$0	$0	$4,560,716
2033/34		$1,226,656		$0	$0	$0	$5,787,372
2034/35		$1,245,056		$0	$0	$0	$7,032,428
2035/36		$1,263,732		$0	$0	$0	$8,296,160
2036/37		$1,282,688		$0	$0	$0	$9,578,848
2037/38		$1,301,928		$0	$0	$0	$10,880,776
2038/39		$1,321,457		$0	$0	$0	$12,202,233
2039/40		$1,341,279		$0	$0	$0	$13,543,512
TOTAL		**$28,365,786**	**($14,822,274)**	**$9,000,000**	**$5,822,274**		**$13,543,512**

Notwithstanding the University's past success, including that of the program currently in progress, significant energy reduction opportunities remain. Continued implementation of the *Envision* program and the new technologies and opportunities is warranted to keep our energy bill as low as cost effectively feasible, reduce our consumption of non-renewable resources, minimize our environmental impact, demonstrate our commitment to sustainability, and realize many other benefits.

It is recommended that:

- The current *Envision* program be accelerated to quickly realize the benefits of the new technologies and opportunities, with borrowing of $9,000,000 to implement the third year of the program, and with subsequent borrowing of $8,000,000 for each of the following two years of implementation.
- The University borrow not more than $9,000,000 from the Alberta Capital Finance Authority for a term not to exceed fifteen years at an interest rate not to exceed 7% for the purpose of funding the third year of the *Envision* program.

OUTLINE OF ISSUE

Agenda Title: ***Envision*** **Year 3 – Borrowing Resolution and Order in Council**

Motion: THAT the Board Finance and Property Committee recommend that the Board of Governors:

a) execute a Borrowing Resolution requesting approval of financing the third year of the five-year *Envision* energy management program in an amount not to exceed Nine Million Dollars ($9,000,000.00) in Canadian funds for a term not to exceed fifteen (15) years at an interest rate of not more than five and one-half percent (5.5%); and

b) make an application to the Minister of Innovation and Advanced Education for the required approval of the Lieutenant Governor in Council.

Item

Action Requested	☐Approval ☒Recommendation ☐Discussion/Advice ☐Information
Proposed by	Don Hickey, Vice-President (Facilities and Operations)
Presenter	Don Hickey, Vice-President (Facilities and Operations)
Subject	*Envision* Year 3 - Financing

Details

Responsibility	Vice-President (Facilities and Operations)
The Purpose of the Proposal is (please be specific)	To obtain financing to fund the implementation of the third year of the five-year *Envision* energy management program. A borrowing resolution and borrowing motion requires the approval of the Board of Governors, based on the recommendation of the Board Finance and Property Committee, in order that the required Order in Council may be obtained from the Government of Alberta prior to undertaking the implementation.
The Impact of the Proposal is	Allows implementation of the third year of the *Envision* energy management program to achieve energy savings. Other benefits achieved are: reduced operating and maintenance costs; improved space conditions; infrastructure renewal to address deferred maintenance; reduction of greenhouse gas emissions; and support of and commitment to sustainable development.
Replaces/Revises	N/A
Timeline/Implementation Date	April 2015 – March 2016
Estimated Cost	$9,000,000.00
Sources of Funding	Borrowing of $9,000,000.00 from the Alberta Capital Finance Authority with payback from the energy savings.
Notes	The financial analysis, projected cash flow, and payment schedule that would be required to service a $9,000,000.00 loan over a 15-year term, modeled on two interest rate scenarios is included in the attached document titled, *Envision* Year 3*, 2015-2016*, dated April 1, 2015. The 5.5% interest rate is a conservative rate based on current lending rates from the Alberta Capital Finance Authority (ACFA). To establish an upper limit for borrowing purposes, an analysis and cash flow projection was also performed to determine the effect if inflationary pressures caused interest rates to rise above the 5.5% used in the model, with concurrent inflation/escalation on the utility rates. The 15-year amortization financial model can support interest rate increases up to 7% with 1.5% escalation in utility rates beyond 2018/2019.

Alignment/Compliance

Alignment with Guiding Docs	Dare to Deliver; Comprehensive Institutional Plan
Compliance with Legislation, Policy and/or Procedure Relevant to the Proposal (please quote legislation and include identifying section numbers)	PSLA, Section 60 (1)(b) refers: *The Board of a public post-secondary institution shall develop, manage and operate, alone or in co-operation with any person or organization, programs, services and facilities for the educational or cultural advancement of the people of Alberta* PSLA, Section 72 (1)(2) and (3) refers: *Borrowing* *72* ***(1)*** *A board may borrow from any bank or treasury branch or from any other person any sum of money required to meet the expenses of the public post-secondary institution until the time the revenues for the current year are available.* ***(2)*** *Any borrowings made pursuant to subsection (1) must be repaid out of and are a first charge on the revenues of the current year, and may be secured by a promissory note or notes given on behalf of the board in any manner the board may arrange.* ***(3)*** *Subject to the approval of the Minister, a board may for the purposes of the public post-secondary institution, as defined in section 73, borrow by way of temporary loans from any bank or treasury branch or from any other person any sums of money on any terms that the board determines, by way of an overdraft or line of credit or by the pledging as security for the temporary loans of notes, bonds, debentures or other securities of the board pending the sale of them, or instead of selling them, or in any other manner the board determines.* *BFPC Terms of Reference, Section 3 (g) states:* *3. MANDATE OF THE COMMITTEE* *Except as provided in paragraph 4 and in the Board's General Committee Terms of Reference, the Committee shall monitor, evaluate, advise and make decisions on behalf of the Board with respect to all strategic and significant financial and property matters and policies of the University. The Committee shall also consider any other matter delegated to the Committee by the Board.* *Without limiting the generality of the foregoing, the Committee shall:* *g) review and recommend to the Board original Capital Expenditure Authorization Requests or individual Supplemental CEARs greater than $7 million or aggregate total CEAR and Supplemental CEARs up to, but not exceeding $14 million.* *4. LIMITATIONS ON DELEGATION BY THE BOARD* *The general delegation of authority by the Board to the Committee shall be limited as set out in this paragraph. Notwithstanding the general delegation of authority to the Committee set out in paragraph 3, the Board shall:* *(c) approve capital expenditures of more than $7 million or expenditures which, when combined with other expenditures for the same project, would equal more than $7 million;*

Routing (Include meeting dates)

Consultative Route (parties who have seen the proposal and in what capacity)	AVP, Operations and Maintenance, Facilities and Operations Vice-President, Facilities and Operations President's Executive Committee – Operational – May 7, 2015
Approval Route (Governance) (including meeting dates)	Board Finance and Property Committee – June 2, 2015 Board of Governors – June 19, 2015
Final Approver	Board of Governors

Attachments:

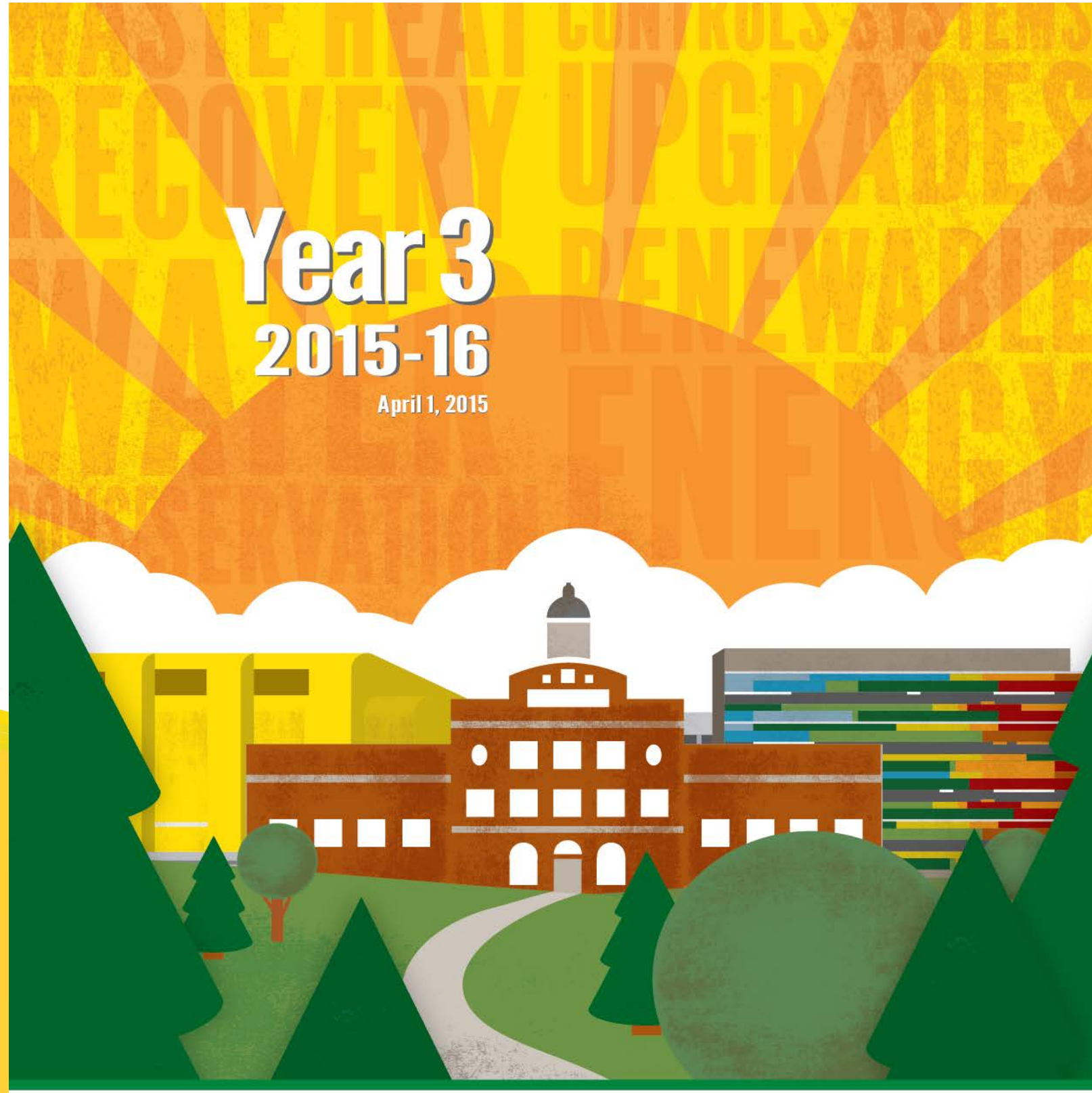
1. *Envision* Year 3*, 2015-2016*, dated April 1, 2015 (11 Pages)
2. Borrowing Resolution (2 Pages)

Prepared by: Michael Versteege, Manager, Energy Management & Sustainable Operations, 4th Floor General Services Building, Phone: 780-492-4024, Email: mike.versteege@ualberta.ca

UNIVERSITY OF ALBERTA
FACILITIES AND OPERATIONS

ENvision

INTELLIGENT ENERGY REDUCTION



Year 3
2015-16

April 1, 2015

UNIVERSITY OF ALBERTA
FACILITIES AND OPERATIONS

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A very successful Energy Management Program has been in place at the University of Alberta since the mid-1970s. The University's program resulted in an annual cost avoidance of $16,870,197 in 20013/2014, with an accumulated cost avoidance in excess of $319,980,000 achieved since its inception in 1975/1976. While building area has increased 74% since 1975/76, utility consumption per square metre has decreased. Utility consumption per square metre for electricity and steam would be 33% and 49% higher respectively had energy conservation measures not been implemented. As well the program has resulted in a cumulative emissions reduction in excess of 2,300,000 tonnes of CO_2.

The University is currently implementing a Next Generation Energy Management Program that was developed in the spring of 2011, and subsequently rebranded under the name *Envision,* which identified the potential for $35,000,000 of energy management implementations phased over a 7-year period ($5 million/year). Annual savings at the completion of the 7-year program are estimated to be in the order of $3,800,000 and CO_2 emission reductions are anticipated to be in the order of 30,000 tonnes.

Board of Governors have approved the current seven year $35,000,000 program based on an approach of $5,000.000 per year borrowing over seven years. Currently we are in the implementation of the first and second years of the program borrowing of $10,000,000 from the Alberta Capital Finance Authority to finance. Preliminary audits and feasibility studies for years three through seven have identified new technologies that have the potential to provide significant energy savings savings for the institution. These are: demand based laboratory ventilation; occupancy based space ventilation; and energy analytics.

To quickly realize the benefits of these new technologies and the low cost of borrowing it is recommended that the current program be accelerated from a seven year program to a five year program with borrowing of $9,000,000 to implement the third year of the *Envision* program, and with subsequent borrowing of $8,000,000 for each of the following two years of implementation.

Continued implementation of the *Envision* program and these new technologies and opportunities is warranted to keep our energy bill as low as cost effectively feasible. Other benefits that would also result are reduced operating and maintenance costs, improved space conditions, infrastructure renewal to address deferred maintenance, reduced demand on utility plant and distribution infrastructure, and significant environmental benefits. Implementation of the *Envision* program also further demonstrates the University's solid and on-going actions and commitment to sustainability. Actions taken by the University of Alberta to improve energy efficiency align with the strategic direction of the University and contribute to city-wide, regional, provincial and national efforts to reduce the impact of greenhouse gas emissions on the global climate.

As indicated above, a number of new technologies and opportunities have recently presented themselves that were not anticipated in the initial development of the current program. These are:

- Demand based laboratory ventilation
- Occupancy based space ventilation
- Energy analytics

Each of these initiatives, outlined briefly below, is expected to significantly reduce the University's energy consumption, energy intensity, greenhouse gas emissions, and utility costs.

Demand Based Laboratory Ventilation Control

Laboratory environments consume significant amounts of energy typically exchanging air at 8-10 times an hour with 100% outside air, often 24 hours a day, 7 days a week, and typically consume twice the amount of energy as an office/classroom space. In addition to the energy required to supply and exhaust large quantities of air, significant amounts of energy are expended to heat or cool, and condition this air.

Demand based laboratory ventilation control technology is an integrated sensing, control, and optimization solution that cost-effectively reduces building energy and operating expenses while simultaneously maintaining indoor environmental quality.

The proper amount of ventilation needed is based on continuous monitoring and analysis of the air within the facility for airborne contaminants. Sensed parameters include total volatile organic compounds (TVOCs), particulates, carbon dioxide, carbon monoxide, temperature, and dew point temperature.

Through real time sensing and continuous analysis of indoor environments the system dynamically reduces air change rates when the air is clean which is typically the majority of time, saving vast amounts of energy, but dynamically raises the rates as required to maintain indoor environmental quality when pollutants are sensed.

The continuous monitoring and analysis process inherent in the technology also facilitates real time commissioning that allows system degradation to be easily observed and corrected, maintaining long term energy savings. Actionable system information that helps to quickly address issues when they arise results in better management of the facility, tracking of airside energy use, and improvement in lab management and safety.

Occupancy Based Space Ventilation

Occupancy based space ventilation is an occupancy counting technology that determines real-time space occupancy levels and through integration with the building automation system triggers real-time and dynamic control of the space ventilation systems.

Fan operation, fan speed, levels of ventilation and fresh air are based on the space being occupied and only on the actual numbers of occupants in the space, versus ventilating spaces that may be unoccupied or to levels required for the maximum potential number of occupants. This results in reduced fan power requirements, and reduced energy to heat or cool fresh air.

Capturing occupancy trends across a day/week/ month allows operations staff to better understand actual space utilization and to optimize ventilation system operation and implement energy efficient strategies.

Implementation of occupancy based space ventilation technology results in reduced energy consumption, better air quality and occupant comfort, reduced operating and maintenance costs, and reduced impact on the environment.

Energy Analytics

The objective of energy analytics is to develop a long term strategy for energy cost reduction as a result of improvements in energy and operational efficiency of heating, ventilating, and air-conditioning (HVAC) systems, and improvements in facility management through the implementation of an Enterprise Energy Information Management System (EEIMS) solution.

The EEIMS directly or indirectly interfaces with and consolidates various real-time and historical energy related data sources (e.g. energy consumption, costs, building automation system information, control and monitoring points) into a data warehouse, analyzes and normalizes the data for subsequent processing, develops a common database and provides a platform for analytics tools to easily access the data and obtain actionable information.

This information is categorized, stored and analyzed to provide a series of functions that include energy usage history, benchmarking, recognition of anomalies, display on dashboards, fault diagnostics and detection.

The EEIMS makes data-driven information, analytics, tools and resources available so that facility engineering, maintenance, and operations staff are able to perform in-depth diagnostics, engineering analysis, and monitoring to develop actionable strategies in a small fraction of the time it took with earlier methods.

The goal is to gain a better understanding of the real-time and historical trending through use of rule-based engines and analytics tools that can define key areas of improvement. It is anticipated that improvements will fall into multiple categories including:

- Scheduling improvements
- System optimizations
- Energy load shedding, and/or shifting strategies
- Maintenance process improvements including deferred maintenance, predictive maintenance versus scheduled maintenance
- Predicting energy cost deviations versus usage
- Identifying usage patterns, anomalies, and identifying system process adjustments for greater optimization

Analytics, continuous commissioning, fault detection and diagnostic software-based tools will monitor the operation of building HVAC systems and identify potential performance problems for corrective action.

The EEIMS will help to identify areas to improve energy and operational efficiency, enhance operational and management effectiveness, improve building performance, save energy, reduce environmental footprint, systematically improve comfort, lower maintenance costs, measure & verify results, and allow deployment of internal and external maintenance and operations resources in a proactive and efficient manner.

The following projects comprise Year One of the *Envision* program:

Augustana Residence Lighting Retrofit
Camrose Performing Arts Centre (CPAC) Energy Efficiencies and Renewable Energy
PAW Centre Energy Efficiencies and Renewable Energy
Katz Demand Based Laboratory Ventilation
South Academic Building Window Replacement
Car Park Lighting Retrofits (Educ, ECERF, Timms/Telus, Southfield, Stadium, Windsor)

The Car Park lighting retrofit projects are currently in the design phase. All other projects are complete.

The above projects are on track with the $5,000,000 budget for year one and with payback within 15 years.

The following projects comprise Year Two of the *Envision* program:

CCIS Demand Based Laboratory Ventilation
Agri-Food Discovery Demand Based Laboratory Ventilation
Li-Ka Shing Demand Based Laboratory Ventilation
NREF Demand Based Laboratory Ventilation
ECV Infill Residences Energy Efficiency Measures
Peter Lougheed Leadership College Energy Efficiency Measures
RTF Lighting Retrofit

The CCIS, Li-Ka Shing, and RTF projects are complete. The ECV Infill Residences and the Peter Lougheed Leadership College projects are currently under construction. The Agri-Food Discovery and NREF demand based laboratory ventilation projects are currently in the design phase.

The above projects are on track with the $5,000,000 budget for year two and with payback within 15 years.

Preliminary assessment and early project identification has been conducted for the third year of the *Envision* program. The following projects have been identified and are currently being further investigated and developed:

Agriculture Forestry - Demand Based Laboratory Ventilation
Earth Sciences - Demand Based Laboratory Ventilation
Energy Analytics Implementations
Occupancy Based Space Ventilation Implementations
Waste to Energy High Solids Anaerobic Digester Facility (HSADF)
Campus Saint-Jean – Solar PV, Solar Thermal
Cameron Library – Energy Efficiency, Solar PV, Micro Steam Turbine Generator
Pump System VSD's and Controls - Medical Sci, Bio Sci, Agriculture Forestry
Domestic Water Reduction – General Services Building
Chemistry Complex – Demand Based Laboratory Ventilation

Based on the analysis to date, the estimated cost for implementation of Year 3 of the *Envision* program is $9,000,000. Average annual energy savings from this implementation over the fifteen-year period is estimated in the order of $1,054,048. Based on Utility forecasts to 2018/19 and a 1.5% escalation thereafter, payback of the third year of the program occurs within a fifteen year period. As in the previous energy management programs, it is proposed that these projects be financed through borrowing from the Alberta Capital Finance Authority over a fifteen-year amortization period.

Financial feasibility is checked through each stage of development of a project (preliminary feasibility, detailed audit, preliminary design, detailed design, and tender) with project costs and energy savings refined at each stage of the process to confirm viability. Projects are modified if necessary during the various development stages to maintain feasibility. As well, the annual programs and the program as a whole are reviewed on an on-going basis to confirm viability.

Following is the financial analysis for the third year of the *Envision* program and the cash flow projection and payment schedule that would be required to service a $9,000,000 loan over a fifteen-year term, modeled at an interest rate of 5.5%. *(The lending rate from the Alberta Capital Finance Authority (ACFA) as of March 15, 2015, is 2.235% per annum for a fifteen-year amortization period.)*

To establish an upper limit for borrowing purposes, an analysis and cash flow projection was also performed to determine the effect if inflationary pressures caused interest rates to rise above the 5.5% used in the model, with concurrent inflation/escalation on the utility rates. The fifteen-year amortization financial model can support interest rate increases up to 7% with 1.5% escalation in utility rates.

The savings are based on the University of Alberta Utilities Department electricity and steam cost forecasts to 2018/19 with a 1.5% per year increase in utility rates thereafter.

The internal rate of return (IRR) for the third year of the *Envision* program with an economic life of twenty-five years is 10.93%. The net present value (NPV)[1] with a fifteen year amortization period, 4% opportunity cost of capital, and 7% assumed financing cost is $6,265,223. The 10.93% IRR[2] is well above the opportunity cost of capital at 4%, and the NPV is positive, which would indicate good project viability for Year-3 of the program.

[1] NPV is the value of the monetary impact of the project in terms of today's dollars, i.e. if all future cash flows are discounted into today's dollars, and the cost of the project is subtracted, this will give a NPV total. If the total is positive the project is deemed as acceptable, if negative it is not. For this analysis, an opportunity cost of capital of 4% was used and financing costs were assumed to be 7.0%.

[2] IRR is a measure of the interest yield on a project over its useful life. As long as the IRR is greater than the opportunity cost of capital (4.0%), the project is deemed acceptable.

Projected Cash Flow, Loan Payment, and Savings Schedule
15 Year Amortization Period, 5.5% Interest Model

Fiscal Year	Project Expense	Energy Savings	ACFA Loan Payment	Principal	Loan Interest 5.5%	ACFA Loan Balance	Net Cumulative Cash Flow
Apr-15	$40,000						-$40,000
May-15	$40,000						-$80,000
Jun-15	$100,000						-$180,000
Jul-15	$280,000						-$460,000
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Dec-15	$1,160,000						-$5,700,000
Jan-16	$1,120,000						-$6,820,000
Feb-16	$1,100,000						-$7,920,000
Mar-16	$1,080,000		$9,000,000				$0
2015/16		$990,000	($896,630)	$401,630	$495,000	$8,598,370	$93,370
2016/17		$1,051,441	($896,630)	$423,720	$472,910	$8,174,650	$248,181
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2027/28		$1,121,829	($896,630)	$763,583	$133,048	$1,655,466	$1,860,135
2028/29		$1,138,656	($896,630)	$805,580	$91,051	$849,887	$2,102,161
2029/30		$1,155,736	($896,630)	$849,887	$46,744	$0	$2,361,267
2030/31		$1,173,072		$0	$0	$0	$3,534,339
2031/32		$1,190,668		$0	$0	$0	$4,725,007
2032/33		$1,208,528		$0	$0	$0	$5,933,535
2033/34		$1,226,656		$0	$0	$0	$7,160,191
2034/35		$1,245,056		$0	$0	$0	$8,405,247
2035/36		$1,263,732		$0	$0	$0	$9,668,979
2036/37		$1,282,688		$0	$0	$0	$10,951,667
2037/38		$1,301,928		$0	$0	$0	$12,253,595
2038/39		$1,321,457		$0	$0	$0	$13,575,052
2039/40		$1,341,279		$0	$0	$0	$14,916,331
TOTAL		**$28,365,786**	**($13,449,456)**	**$9,000,000**	**$4,449,456**		**$14,916,330**

Projected Cash Flow, Loan Payment, and Savings Schedule

(to establish upper limit of borrowing)

15 Year Amortization Period, 7.0% Interest Model

Fiscal Year	Project Expense	Energy Savings	ACFA Loan Payment	Principal	Loan Interest 7.0%	ACFA Loan Balance	Net Cumulative Cash Flow
Apr-15	$40,000						-$40,000
May-15	$40,000						-$80,000
Jun-15	$100,000						-$180,000
Jul-15	$280,000						-$460,000
Aug-15	$380,000						-$840,000
Sep-15	$980,000						-$1,820,000
Oct-15	$1,340,000						-$3,160,000
Nov-15	$1,380,000						-$4,540,000
Dec-15	$1,160,000						-$5,700,000
Jan-16	$1,120,000						-$6,820,000
Feb-16	$1,100,000						-$7,920,000
Mar-16	$1,080,000		$9,000,000				$0
2015/16		$990,000	($988,152)	$358,152	$630,000	$8,641,848	$1,848
2016/17		$1,051,441	($988,152)	$383,222	$604,929	$8,258,626	$65,138
2017/18		$973,991	($988,152)	$410,048	$578,104	$7,848,578	$50,978
2018/19		$981,143	($988,152)	$438,751	$549,400	$7,409,827	$43,969
2019/20	1.5%	$995,860	($988,152)	$469,464	$518,688	$6,940,363	$51,677
2020/21		$1,010,798	($988,152)	$502,326	$485,825	$6,438,037	$74,323
2021/22		$1,025,960	($988,152)	$537,489	$450,663	$5,900,548	$112,131
2022/23		$1,041,349	($988,152)	$575,113	$413,038	$5,325,435	$165,329
2023/24		$1,056,969	($988,152)	$615,371	$372,780	$4,710,064	$234,147
2024/25		$1,072,824	($988,152)	$658,447	$329,704	$4,051,617	$318,819
2025/26		$1,088,916	($988,152)	$704,538	$283,613	$3,347,078	$419,583
2026/27		$1,105,250	($988,152)	$753,856	$234,295	$2,593,222	$536,682
2027/28		$1,121,829	($988,152)	$806,626	$181,526	$1,786,596	$670,359
2028/29		$1,138,656	($988,152)	$863,090	$125,062	$923,506	$820,864
2029/30		$1,155,736	($988,152)	$923,506	$64,645	$0	$988,448
2030/31		$1,173,072		$0	$0	$0	$2,161,520
2031/32		$1,190,668		$0	$0	$0	$3,352,188
2032/33		$1,208,528		$0	$0	$0	$4,560,716
2033/34		$1,226,656		$0	$0	$0	$5,787,372
2034/35		$1,245,056		$0	$0	$0	$7,032,428
2035/36		$1,263,732		$0	$0	$0	$8,296,160
2036/37		$1,282,688		$0	$0	$0	$9,578,848
2037/38		$1,301,928		$0	$0	$0	$10,880,776
2038/39		$1,321,457		$0	$0	$0	$12,202,233
2039/40		$1,341,279		$0	$0	$0	$13,543,512
TOTAL		**$28,365,786**	**($14,822,274)**	**$9,000,000**	**$5,822,274**		**$13,543,512**

Notwithstanding the University's past success, including that of the program currently in progress, significant energy reduction opportunities remain. Continued implementation of the *Envision* program and the new technologies and opportunities is warranted to keep our energy bill as low as cost effectively feasible, reduce our consumption of non-renewable resources, minimize our environmental impact, demonstrate our commitment to sustainability, and realize many other benefits.

It is recommended that:

- The current *Envision* program be accelerated to quickly realize the benefits of the new technologies and opportunities, with borrowing of $9,000,000 to implement the third year of the program, and with subsequent borrowing of $8,000,000 for each of the following two years of implementation.
- The University borrow not more than $9,000,000 from the Alberta Capital Finance Authority for a term not to exceed fifteen years at an interest rate not to exceed 7% for the purpose of funding the third year of the *Envision* program.

RESOLUTION OF

THE BOARD OF GOVERNORS OF THE UNIVERSITY OF ALBERTA

("Board of Governors")

WHEREAS the Board of Governors, to carry out the purposes of the University of Alberta, considers it appropriate and necessary to proceed with the implementation of the third year of the five-year *Envision* energy management program at a currently budgeted cost of Nine Million Dollars in Canadian funds ($9,000,000.00) ("Project"); and

WHEREAS the Board of Governors considers it appropriate and necessary to borrow funds from the lender described in this resolution.

IT IS HEREBY RESOLVED THAT:

1. Pursuant to Section 73 of the *Post-secondary Learning Act* and subject to the prior approval of the Lieutenant Governor in Council, the Board of Governors, for the purposes of the University of Alberta, authorizes and approves the borrowing of an amount to fund the Project not to exceed Nine Million Dollars ($9,000,000.00) in Canadian funds ("Loan").

2. The Loan be:

   (a) from a lender which is the Alberta Capital Finance Authority ("Lender") in an amount not to exceed Nine Million Dollars ($9,000,000.00) in Canadian funds;
   (b) for a term not to exceed fifteen (15) years;
   (c) at an interest rate not to exceed five and one-half percent (5.5%) per annum;

   And that within the parameters set out in this section 2, the establishment of the amount, term and interest rate be made by the Vice-President (Finance and Administration).

3. To secure the repayment of the Loan, the University of Alberta grant to the Lender such security as may be required by the Lender and agreed to by the Vice-President (Finance and Administration).

4. The Vice-President (Finance and Administration) be and is hereby authorized for and on behalf of the University of Alberta to:

a) Negotiate, execute and deliver to the Lender such notes, bonds, debentures or other securities in such form, with or without seal, and containing such terms and conditions related to amount, denomination, time and place of payment, principal and interest and redemption as the Lender requires as a condition of the Loan;
b) Include in the security the Lender requires as a condition of the Loan all such securities, debentures, charges, pledges, mortgages, conveyances, assignments and transfers to or in favour of the Lender of all or any property, real or personal, moveable or immovable, owned by the University of Alberta or in which it may have an interest as the Lender may require;
c) Give the Lender any other documents or contracts necessary to give or furnish to the Lender the security or securities required by the Lender including without limiting the generality of the foregoing, all or any receivables, book debts due or growing due, stocks, bonds, insurance policies, promissory notes, bills of exchange and securities of all kinds.

5. All agreements, securities, documents and instruments proposing to be signed, made, drawn, accepted, executed or endorsed as provided in this resolution shall be valid and binding on the University of Alberta.

6. The Lender shall be furnished with a signed copy of this resolution.

I hereby certify that this resolution has full force and effect on the _____ day of _____, 2015.

_____
Chair of The Board of Governors of the
University of Alberta

OUTLINE OF ISSUE

Agenda Title: **Anderson Lands – Disposition of Land**

Motion: THAT the Board Finance and Property Committee, acting with delegated authority of the Board of Governors, approve, on terms and conditions acceptable to the Vice-President (Facilities and Operations), the disposition of:

- property legally described as the SW Quarter of Section 21, Township 28, Range 5, West of the 4th Meridian, located in eastern Alberta (approximately 6 miles east of Cereal, Alberta) containing approximately 155 acres of land which are surplus to the needs of the University of Alberta.

Item

Action Requested	☒Approval ☐Recommendation ☐Discussion/Advice ☐Information
Proposed by	Facilities and Operations
Presenter	Don Hickey, Vice-President (Facilities and Operations)
Subject	The Disposition of University Lands which consists of the Anderson donated lands.

Details

Responsibility	Vice-President (Facilities and Operations)
The Purpose of the Proposal is (please be specific)	Recommend to the Board Finance and Property Committee to approve the sale of the Anderson lands donated to the University in 2014.
The Impact of the Proposal is	Endowment funding
Replaces/Revises (eg, policies, resolutions)	n/a
Timeline/Implementation Date	2015
Estimated Cost	Brokerage commission of 5.0% of the property sale price.
Sources of Funding	Sale of property
Notes	The sale of this property is considered a land disposition of donated land and therefore does not require the approval of the Lieutenant Governor in Council.

Alignment/Compliance

Alignment with Guiding Documents	Dare to Discover, Dare to Deliver, Comprehensive Institutional Plan, Long Range Development Plan
Compliance with Legislation, Policy and/or Procedure Relevant to the Proposal (please quote legislation and include identifying section numbers)	**Post-secondary Learning Act** *Post-secondary Learning Act (PSLA), Section 67(1.1) A board shall not, without the prior approval of the Lieutenant Governor in Council,(a) sell or exchange any interest in land, other than donated land, that is held by and being used for the purposes of the board.* *BFPC Terms of Reference – Sections 3 and 4 state:* *3. MANDATE OF THE COMMITTEE* *Except as provided in paragraph 4 and in the Board's General Committee Terms of Reference, the Committee shall monitor, evaluate, advise and make decisions on behalf of the Board with respect to all strategic and significant financial and property matters and policies of the University. The Committee shall also consider any other matter delegated to the Committee by the Board.* *Without limiting the generality of the foregoing, the Committee shall:*

	h) approve the acquisition or disposal of real property, provided always that any such decision of the Committee shall be reported to the Board and shall only be effective or implemented a minimum of 24 hours following the conclusion of the Board meeting at which the decision of the Committee is reported, and provided the Board has not resolved otherwise *4. LIMITATIONS ON DELEGATION BY THE BOARD* *The general delegation of authority by the Board to the Committee shall be limited as set out in this paragraph. Notwithstanding the general delegation of authority to the Committee set out in paragraph 3, the Board shall:* *g) review all decisions of the Committee with respect to the acquisition or disposal of real property; after any such review the Board may resolve to overturn or vary any such decision.* **UAPPOL**; Real Property Compliance Policy, Real Property Disposition Procedure: https://policiesonline.ualberta.ca/PoliciesProcedures/Policies/Real-Property-Compliance-Policy.pdf

Routing (Include meeting dates)

Consultative Route (parties who have seen the proposal and in what capacity)	President's Executive Committee – Operational (PEC-O) – May 14, 2015 (for information)
Approval Route (Governance) (including meeting dates)	Board Finance and Property Committee – June 2, 2015 (for approval) Board of Governors – June 19, 2015 (for information)
Final Approver	Board Finance and Property Committee

Attachments

1. Briefing Note (1 page)
2. Property Location (1 page)

Prepared by:
David R. Ward,
Property Manager
University of Alberta
david.ward@ualberta.ca

UNIVERSITY OF ALBERTA

BRIEFING NOTES

Real Estate Services
Ancillary Services
Facilities and Operations

Attachment 1

Anderson Lands – Disposition of Land

Background

By way of a donation by Dr. Gerald Harvey Anderson, the University obtained title on December 22, 2014 to approximately 155 acres of farmland legally described as SE 21-28-5-W4. A donation receipt was issued in the amount of $100,000.00 based on an appraisal prepared for the property. It was agreed with the donor that the lands would be sold and the proceeds, net of any expenses, would be used to establish and endow the "Harvey Anderson Centennial Bar None Award Endowment". The endowment will support an award to be granted to a student with satisfactory academic standing entering the first year of a Bachelor of Science in Agriculture, Animal Health, or Nutrition and Food Science. The award will be known as the "Harvey Anderson Centennial Bar None Award". A Phase One Environmental Report was completed for the property with no issues being found.

Issues

The disposition of University lands requires the approval of the Board Finance and Property Committee.

Recommendation

It is recommended that the Board Finance and Property Committee approve, on terms and conditions acceptable to the Vice-President (Facilities and Operations) the disposition of the subject property.

David R. Ward, Property Manager May 8, 2015

Property Location
Attachment 2