



ReLumen Engineering is an Edmonton based engineering consulting firm providing a broad range of electrical engineering services including high efficiency lighting design, sustainability programs, and project management solutions.

ReLumen and Global Resource Efficiency Services (GRES) have partnered to deliver an innovated sustainability program combining educational programs, building systems optimizations, and energy saving upgrades.

## Experience

We have successfully completed hundreds of projects in a wide range of client facilities, including institutional, commercial, industrial, and residential buildings as well as schools, universities, and hospitals.

Areas of expertise include:

- Energy efficiency audits
- Lighting design, upgrades, and retrofits
- CO<sub>2</sub> reduction audits and carbon credit facilitation
- Fire alarm system design and verification
- Power system design and analysis
- Short circuit, coordination, and arc flash studies
- Utility metering and power monitoring systems
- Master planning of electrical and communication systems for large sites

## Energy Efficiency

ReLumen's lighting designs and upgrades offer industry-leading energy efficiencies, realizing lighting energy densities of 7.5W/m<sup>2</sup> (0.7W/ft<sup>2</sup>) while exceeding IES lighting intensity values. **This yields up to a 70% savings over typical new construction efficiency values.**

## History

Founded in 1987 by Wayne Rogers, P.Eng., L.C., ReLumen has earned a reputation for excellence and technical proficiency. John Bertrand, P.Eng., MBA, joined ReLumen as partner in 2005 bringing over thirty years of electrical engineering and project management experience to the firm. ReLumen now has a staff of twenty and is licensed to practice engineering in Alberta and British Columbia.

## Media Coverage and Awards

Mr. Bertrand's and ReLumen's electrical and lighting design projects for Vancouver Wharves have been featured in Electrical Business magazine and in BC Hydro's Power Smart publication. The Vancouver Wharves lighting improvements have received two **Power Smart Excellence Awards** (2006 & 2007) highlighting the improved light quality, energy savings, and cost reductions. ReLumen has participated in three lighting upgrade projects resulting in 3,936,000kWh of annual energy savings and an annual cost reduction of \$194,000.

ReLumen has received a number of Illuminating Engineering Society of North America **International Illumination Design Awards of Merit** for projects at the University of Alberta, including the Cameron Library, the Butterdome, and most recently the Rutherford Libraries Lighting Upgrade. These awards recognize the functional and aesthetic quality of ReLumen's lighting designs.

ReLumen staff have received a **Teamworks Award** from Alberta Infrastructure and Transportation, recognizing excellence in teamwork, cooperation, and communication as prime consultant for a major data centre power system upgrade for the main Province of Alberta data center in Edmonton.



Vancouver Wharves



Rutherford Libraries North

## Sustainability Program Goals

- ☑ **Positive cash flow in the first program year;** utility cost savings pay for program efforts (see Figure 1).
- ☑ Sustainability policy and plan developed at senior management level.
- ☑ Occupant awareness programs and web info center share information with all stakeholders and ensure buy-in.
- ☑ Building system upgrades and optimization resulting in **substantial energy efficiency gains** and cost savings.
- ☑ Verifiable **reduction of CO<sub>2</sub> emissions** and assistance obtaining emissions credits.
- ☑ Training and standards development for operations and maintenance groups to ensure **lasting program benefits**.

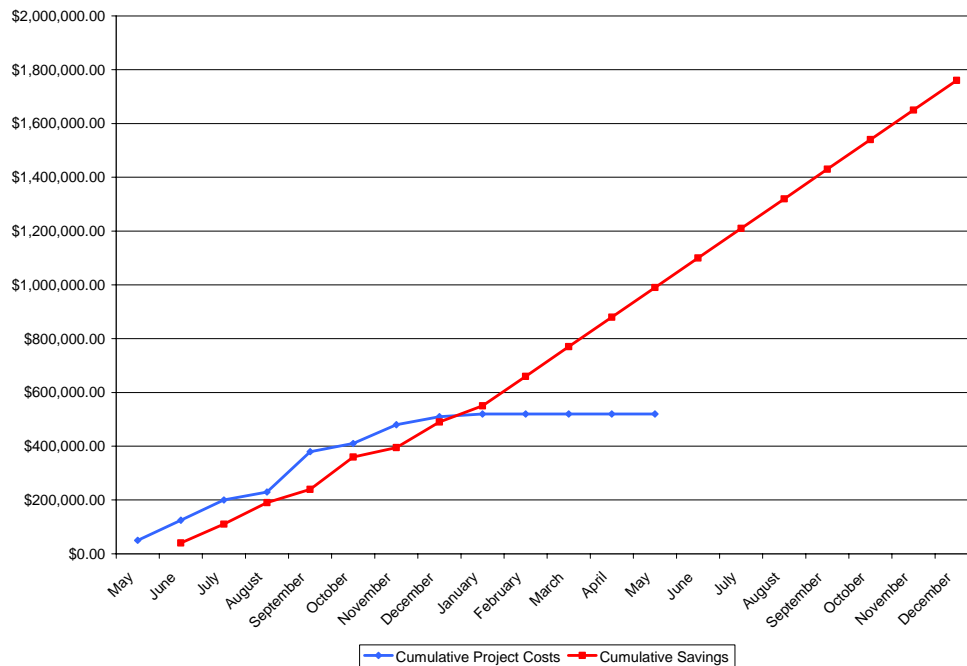


Figure 1: Typical Program Cost Recovery Scenario

## Sustainability Program Outline

All successful sustainability programs share a common general structure – a continuous loop. This is necessary so that the effects of sustainability actions are measured and verified – this information can then be used to champion future sustainability measures, and to refine them in order to improve performance even further.

This continuous loop takes the form of the Audit – Implement – Monitor (AIM) cycle in our sustainability program, as shown in Figure 2 below.

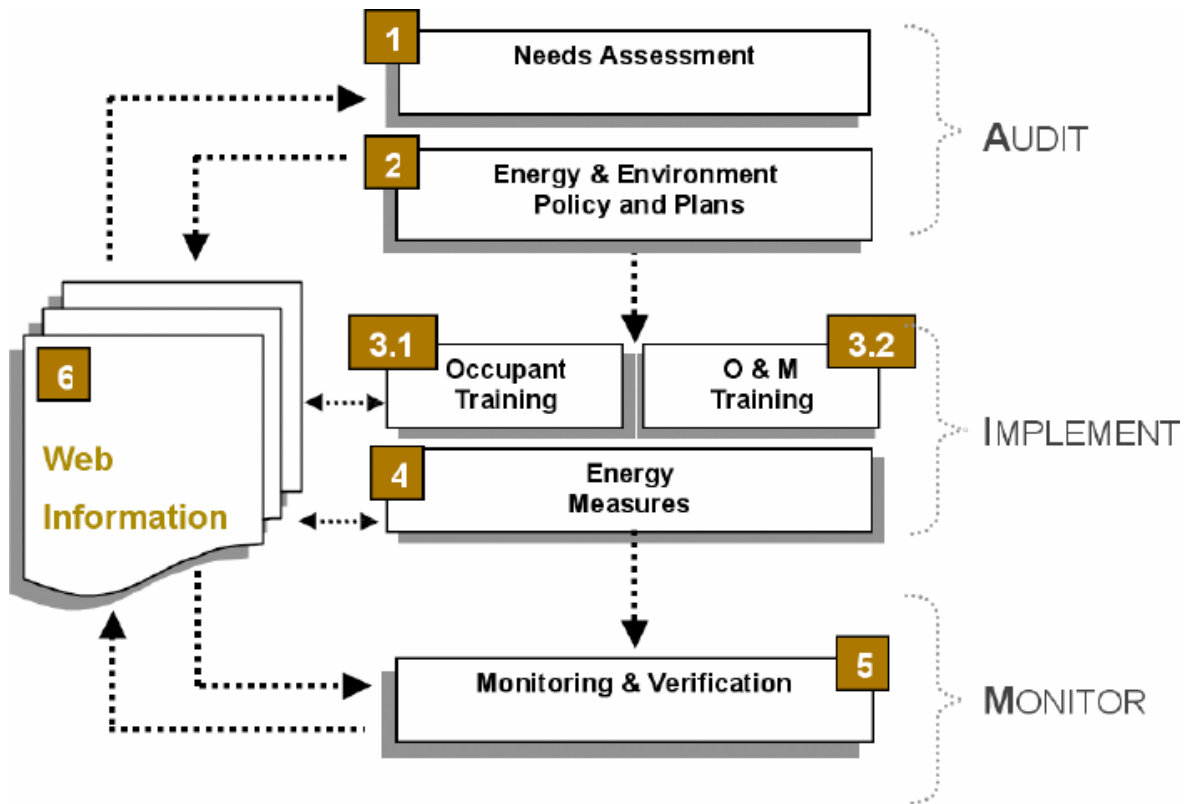


Figure 2: Audit – Implement – Monitor Cycle

A brief outline of each step illustrated in Figure 2 is given below (numbering is consistent with Figure 2).

## **1. Needs Assessment**

Projects are approached with an initial emphasis on requirements development through on-site client meetings, focus groups, audits, and analysis of historical energy data. This ensures that a complete and accurate picture of both present conditions and the client's vision of the future are captured. This picture is then used to create a complete Sustainability Plan.

## **2. Sustainable Energy & Environmental Plan**

The sustainability plan is used to identify energy saving opportunities through modifications to occupant behaviour, building systems, and building maintenance group training. This holistic approach ensures that energy savings are pervasive and long-lasting rather than the one-shot savings as often realized through other methods.

## **3. Training**

### **3.1. Occupant Training**

Building Occupant Awareness Training is designed to provide building users with information on the sustainable operation of building systems, including the energy efficient choices users can make in operating computer equipment and lighting.

This training is specifically targeted to users' needs as identified in the workshops and other activities of the Needs Assessment step.

### **3.2. Operations and Maintenance Training**

Building Operation Guides are developed and customized for the unique requirements of each facility. These guides establish the operations and maintenance standards of performance and are manuals on operating building systems to those standards.

This training is specifically targeted to users' needs as identified in the workshops and other activities of the Needs Assessment step.

## **4. Energy Measures**

Energy and Environmental Measures are the extensive efforts undertaken to upgrade or retrofit building systems with new, energy efficient and cost effective technologies. A prime candidate area for these efforts is the upgrading and retrofitting of lighting technologies, which typically yields energy savings of 50-75% while improving lighting intensity and quality.

## 5. Monitoring and Verification

Real time monitoring and analysis of utility bills, both before and after a project, are used in order to document energy savings as well as to monitor a facility's continued performance. These verified savings can then be used to obtain Carbon Credits and LEED points. The feedback from Monitoring and Verification is an essential ingredient for future successful sustainability programs.

## 6. Web Information

The Web Info Center serves as an information portal for all resource conservation activities within the organization. All resources, learning, and reference materials are available to promote lasting change. The Web Info Center also displays the current energy savings as reported through real time monitoring, reinforcing positive behaviour and providing a powerful motivator to all stakeholders.

## 7. Financing

Financing can be provided via leasing for improvements such as windows, doors, furnaces, heat pumps, lighting, insulation, vending misers and other energy savings technology such as solar and geothermal systems. Up to 100 percent can be financed over a 5 to 15 year term, depending on the client's preference. The only requirements are a quote for the equipment from the supplier and the name and info of the lessee. An offer to lease can be provided in 24 hours. Funding of 20% will be provided on acceptance of the Lease Agreement and 80% on installation and acceptance of the equipment by the client.

## 8. Efficiency Products

Quick payback energy technologies are available that typically have paybacks of less than two years or save 50% or more in energy savings when compared to existing technologies. Products include, but are not limited to: induction lighting, LED lighting, fluorescent lighting, Energy Misers, occupancy based controls, Maximicers and the Safe-T- Element. Products are proven with demonstrated energy saving results. Most products are very simple to install.

## Contact Us

ReLumen is located at #200, 10047 – 81 Avenue, Edmonton, AB. For any inquiries, please contact ReLumen Chief Operating Officer John Bertrand at 780-435-5739 or at [john@relumen.com](mailto:john@relumen.com).