Building Monitoring and Ongoing Commissioning at VITP

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Vancouver Island Technology Park

- 35-acre site, 191,000 sq.ft. facility
- 32 Companies, employing over 1100
- Home to VIATEC, NRC-IRAP, BCIC
- Home to 4 publicly-held companies:
  - LifeLabs Inc. (TSX, NYSE)
  - Vigil Health Solutions (TSX Venture)
  - Cisco Systems
  - HP Advanced Solutions
- Tenants contributed $318M to BC economy
- An “educated community”:
  - 63% of employees have a Bachelor's Degree
  - British Columbia average is 18%
Our Vision

• We enable people and ideas to connect through our *power of place*... a physical and cultural environment that inspires and accelerates innovation, knowledge and the growth of small to medium sized enterprises to provide benefit to the University of Victoria and the community as a whole.
LEED @ VITP

- First Renovation Project in the World to Receive LEED 2.0 Gold Certification
- Benefits obtained by going LEED:
  - Differentiation
  - Municipal Support for Master Plan
  - Tenant Attraction (support Corporate Sustainability)
  - Reduction operating costs
Next Generation VITP
The old way of monitoring energy...

- Would you rather monitor your energy consumption monthly or hourly?

VITP Dashboard
Next Generation Sustainability

• By elevating importance of proactive energy management, parks have ability to **cut cost on operations, reduce energy** and carbon footprint

• **Benefits** obtained by “**Going beyond LEED**”:
  • Differentiation
  • Tenant attraction
  • Triple bottom line
  • New interaction, environments, and business.
Continuous Optimization

Real Time Data

Investigation

Implementation

Traditional Re-commissioning

Coaching

Policies and Procedures
### Building Systems

#### General
- 190,000 sq ft
- 3 Buildings interconnected
- Opened in 2001
- LEED Gold
- Annual Energy Use
  - 100,000 Therms NG
  - 7,000,000 kWh Electricity

#### HVAC
- Water source heat pump loop
- Gas fired boilers
- 3 large Air Handling Units, one for each building
- 1 Dual Duct Multizone System
- Perimeter Radiation and hot water force flow heaters
### Results

<table>
<thead>
<tr>
<th></th>
<th>VITP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>7%</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>40%</td>
</tr>
<tr>
<td>Greenhouse Gases</td>
<td>231 Tonnes</td>
</tr>
<tr>
<td>Savings</td>
<td>$71,000</td>
</tr>
<tr>
<td>Costs</td>
<td>$97,000</td>
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<tr>
<td>Payback</td>
<td>1.4 years</td>
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</tbody>
</table>
Building Energy Performance

- VITP Before: 18 kWh/ft² (Electricity 15, Natural Gas 3)
- VITP After: 18 kWh/ft² (Electricity 10, Natural Gas 8)
- NRCAN University Benchmark: 40 kWh/ft² (Electricity 20, Natural Gas 20)

(Images: SES Consulting logo, "engineering energy efficiency")
Gas Demand BEFORE RCx

Average Gas Use

Average Temperature
Electricity Demand BEFORE RCx

**Average Electrical Use**

**Average Temperature**
Measures

**Repairs**
- Failed Heating Valve
- Failed CO2 Sensors
- Failed Static Pressure Sensor
- Release Manual setpoints on Mixed Air Temp and VSDs

**Control Upgrades**
- BAS Upgrade
- Scheduling Adjustments based on individual zone schedules
- Automated Heating Lockouts
- Using Room Temps rather than Outdoor Temp to enable heating systems
- Change Cooling Tower Staging
- SAT Reset Program

engineering energy efficiency
Gas Demand AFTER RCx

Baseline Gas Demand

Average Gas Use

Average Temperature
Electricity Demand AFTER RCx

Baseline Electrical Demand

Average Temperature

Average Electrical Use
Gas CUSUM
Electricity CUSUM

Building Electricity Use

View: Year  Start: 2011-04-09  End: 2012-04-09
Maintaining the Savings

Your People
- Building Operator
- HVAC Contractor
- Energy Manager
- Executive Team

Your Technology
- Real Time Energy Monitoring
- Robust BAS

engineering energy efficiency
Real Time Energy Monitoring

Threshold Alert

**Triggered Message Example:**
Threshold triggered: The threshold "Natural Gas (Demand)" above 'Baseline Natural Gas Demand - VITP Campus (Total)' by 2,000,000 BTU/h' at 'Vancouver Island Technology Park' triggered at 2011-04-27 14:30:00.
Natural Gas (Demand): 4,700,940.459 BTU/h
Baseline Natural Gas Demand - VITP Campus (Total): 1,377,288.343 BTU/h
Difference: 3,323,652.115 BTU/h (241%)
Note: values are averaged over a half-hour

**Cleared Message Example:**
Threshold cleared: The threshold "Natural Gas (Demand)" above 'Baseline Natural Gas Demand - VITP Campus (Total)' by 2,000,000 BTU/h' at 'Vancouver Island Technology Park' cleared at 2011-04-27 15:00:00 after 30 minutes in the triggered state.
Maintaining Savings

- Accurate Baseline Data
- Performance Targets
- Timely Alerts
- Documentation of Exceptions

Real Time Data

- Staff Awareness
- Processes to Track and Respond to Issues
- Timely Information
- Feedback Opportunities

Operations Staff

- New Conservation Opportunities
- Testing Limits
- Changing Requirements
- Occupants Feedback

Facility
Conclusion, Next Steps

• We continue to provide our clients excellence through environmental stewardship and take our operations beyond LEED standards.

• Next step would be to get all of our clients using Pulse Energy’s dashboard, so they can see how best to control their own energy usage within their premises.

• We want to be recognized for more than just offering space. We want to deliver valuable services and a unique experience to our clients. With our commitment to environmental sustainability and our investments in network and communications technologies, we believe we’re achieving our goal.

“We don’t think of the companies using our office space as tenants; they’re clients looking for leading-edge services that will assist them in gaining a competitive edge while enhancing their ability to attract talented employees.”

VANCOUVER ISLAND TECHNOLOGY PARK
A University of Victoria Enterprise
Thank You

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