SEP and ISO 50001 at 3M Canada’s Brockville Plant

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Energy Management at 3M Canada

OVERVIEW

An Introduction to 3M

3M Sustainability

Energy Management Initiatives

Results

Insight

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3M at a Glance

- Established in 1902
- 84,000 employees
- Operations in 65 countries
- 3M products sold in 200 countries
- 46 technology platforms
- Global sales: $30 billion
3M Canada

- First 3M subsidiary (1951)
- Employs 1,900 people
- Seven manufacturing facilities
  - Abrasives
  - Tapes
  - Healthcare,
  - Scotch-Brite
- First subsidiary to have full time energy manager
Brockville Ontario Tape Manufacturing

- High volume masking tape manufacturing operation.
- Established 1992 – 170 Employees
- 200 SKUs ranging from low cost bundling and holding tapes to high temperature fine line automotive masking tapes.
- Current ISO Registrations:
  - ISO 14001
  - ISO 9001-2000
Sustainability at 3M

Since 1932, 3M has been at the forefront of companies adopting programs and policies to ensure environmental protection, social responsibility and economic vitality.

Five Year Environmental Targets
First Set in 1990s
Focused on:
- Reducing Volatile Air Emissions
- Reducing Waste
- Reduce Greenhouse Gas Emissions
- Improving Energy Efficiency
Sustainability at 3M Progress on 2015 Targets

- **VOCs**: 12% reduction from 2006 Base
- **WASTE**: 9% reduction from 2006 Base
- **GREENHOUSE GASES**: 55% reduction from 2006 Base
- **ENERGY EFFICIENCY**: 29% increase from 2005 Base
Motivation

- Support 3M’s global Sustainability commitments
- Sustain energy performance gains.
- Respond to increasing energy cost pressures
- Reinforce reputation with customers
- Provide US-Canada support for GSEP initiative of the Clean Energy Ministerial
- Safeguard 3M’s competitive position in the marketplace
- ISO 50001 EnMS provides bottom line results by driving own energy costs
Successful Energy Management

MEASUREMENT

TECHNOLOGY

PEOPLE
Energy Management with ISO50001

- Voluntary international standard framework to manage energy
- Based on “Plan–Do–Check–Act” continuous improvement cycle
  - Leads to improved energy performance
  - Integrates energy efficiency into management processes
  - Many core elements in common with ISO9001 (quality) and ISO14001 (environmental) ISO standards
SEP – Superior Energy Performance

- US DOE and industry partnership program for energy performance
- Fully incorporates ISO 50001 but adds more requirements per ANSI/MSE-50021 standard
- Prescribes specific silver-gold-platinum energy reduction
- Assesses performance with International M&V Protocol
- Global SEP supported by 13 countries, including Canada, USA and EU
## Implementing ISO 50001 Globally

<table>
<thead>
<tr>
<th>Location</th>
<th>Certification Details</th>
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<tbody>
<tr>
<td>3M Brockville, Ontario</td>
<td>SEP/ISO50001 certified in June 2012</td>
</tr>
<tr>
<td>3M Cordova, Illinois</td>
<td>SEP/ISO50001 certified in Sep 2012</td>
</tr>
<tr>
<td>3M Wroclaw, Poland</td>
<td>ISO 50001 certified in June 2013</td>
</tr>
<tr>
<td>3M Kempten, Germany</td>
<td>ISO 50001 certified in June 2013</td>
</tr>
<tr>
<td>Canada</td>
<td>All Manufacturing locations certified by 2016</td>
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Process

- Build on existing 3M Energy Management legacy
- Integrate a systematic Energy Management System into plant operations & culture
- Leverage existing management system components, 3M business & operations systems where possible
Implementation Process

1. Senior Management Commitment
2. Establish Team
3. Team understanding of the Standard
4. Gap Assessment
5. Work Plan Definition
6. Execution of the Work Plan
7. Re-Gap
8. Certification
Initial Gap Analysis

- Overall: 34%
- Management Review: 0%
- Checking: 0%
- Procurement: 33%
- Design: 0%
- Operational control: 0%
- Documentation: 0%
- Communications: 0%
- Competence, Training & Awareness: 13%
- Energy Planning: 25%
- Energy Policy: 50%
- Mgmt Responsibility-Mgmt REP: 80%
- Mgmt Responsibility-Top Mgmt: 50%

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Work Plan Activities

- **Make Basic Decisions**
  - Scope of EnMS, external communication, etc.
  - Resource allocation - Management Rep, EnMS Coordinator, etc.

- **Adapt Existing Energy Management practices**
  - Energy Policy, Objectives, Targets & Action Plans
  - Project Planning, Management & Results Reporting Systems

- **Leverage Existing Business Systems**
  - Communications, Training, Legal, Internal Audit, Document Control

- **Write EnMS Manual**
  - Documents EnMS Implementation at 3M Brockville Tape Site
  - Addresses All Elements of the Standard
  - Formalizes Top Management Commitment to the EnMS

- **Write Top Level Procedures**
  - Energy Planning, Energy Review, EnPI Selection, Audit, etc.
Energy Management System

Energy Policy
- ISO 50001 Standard
- BkB 501 EnMS Manual & Procedures

Plan
- Energy Review
- Energy Baseline
- Energy Objectives, Targets & Timelines
- Energy Action Plans
- Energy Performance Indicators
- Energy Measurement Plan

Do & Check
- Active Energy Team
  - Energy Enablers: Communications, Training, Design & Procurement
  - Energy Performance Improvement Projects
  - Standardized Operations & Maintenance
  - Energy Performance Monitoring & EnCAPAs

Check & Act
- Management Review
- Internal Audit
- External Audit
Certification Process

- Complete first iteration of the EnMS Planning work
  - Energy Review, EnPIs, Action Plans, etc.
- Activate EnMS Execution work
  - Training, Monitoring, Standardized O&M, Energy Corrective and Preventive Actions etc.
- Conduct Management Review & Internal Audit
  - Engage management team, close audit findings, etc.
- Work the system and generate the records that demonstrate implementation
Certification Process

- **Pre-assessment**
  - Review of EnMS documentation to determine readiness

- **Phase I Audit**
  - Detailed investigation of all system elements

- **Phase II Audit**
  - On-site audit to examine evidence of implementation

- **Brockville Tape Achieved ‘Platinum’ level for SEP**
  - Energy performance improvement exceeding 15% over three years (2007 to 2010)
  - 1st SEP with ISO 50001 EnMS in Canada
  - 2nd SEP platinum level with ISO 50001 in the world
Energy Management System Benefits

- Increased Awareness of Energy Performance
- Improved Procurement & Engineering Practices
- Improved O&M Practices
- Increased Idea Generation – Suggestion System

Improved Energy Performance = Lower Cost
Results

Improved Energy Performance

Brockville Tape has saved $350 K since ISO 50001 implementation
Energy Performance Project

Air Compressor ‘Spiral Valve’ Optimization

- Poor performance, erratic power usage
- Analyzed cause, shutdown and correct
- Improved pressure & flow stability
- 12% KW reduction (25% vs 2010 baseline)
Benefits

CIPEC Energy Award in Corporate Stewardship

Recognizes companies that promote energy efficiency at the corporate level, such as the creation and engagement of an energy management team, the development of a corporate energy management plan or policy, or the implementation of a formalized management system.

Canadian Industry Program for Energy Conservation

Recognizes companies that promote energy efficiency at the corporate level, such as the creation and engagement of an energy management team, the development of a corporate energy management plan or policy, or the implementation of a formalized management system.

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Lessons and Advice

- **Build A Robust System**
  - Management Commitment
  - Allocate Resources:
  - Set EnMS-related job expectations for all levels

- **Use Project Management Techniques**
  - Set deliverables, milestones, responsibilities, follow-up, etc., to drive implementation progress

- **Build On What You Have**
  - Use and integrate existing systems: docs, training, etc.
Key 3M’s Success Factors

- Senior Management Commitment
- Selection Of Team Members
- Expert Consultant Support
- Government And Local Energy Suppliers Support
- Rigorous Project Tracking
- Existing Quality And Environmental Management Systems
- Prior Investments In Energy Management Information System
- Legacy Of Corporate Leadership In Sustainability
At 3M We don’t have a sustainability initiative. We have a sustainability culture.
Questions