"Implementing a Corporate Energy Management System"

Steve Schultz
Corporate Energy Manager
3M

Presented at the U.S. Department of Energy
Industrial Technologies Program
June 3, 2010 Webcast

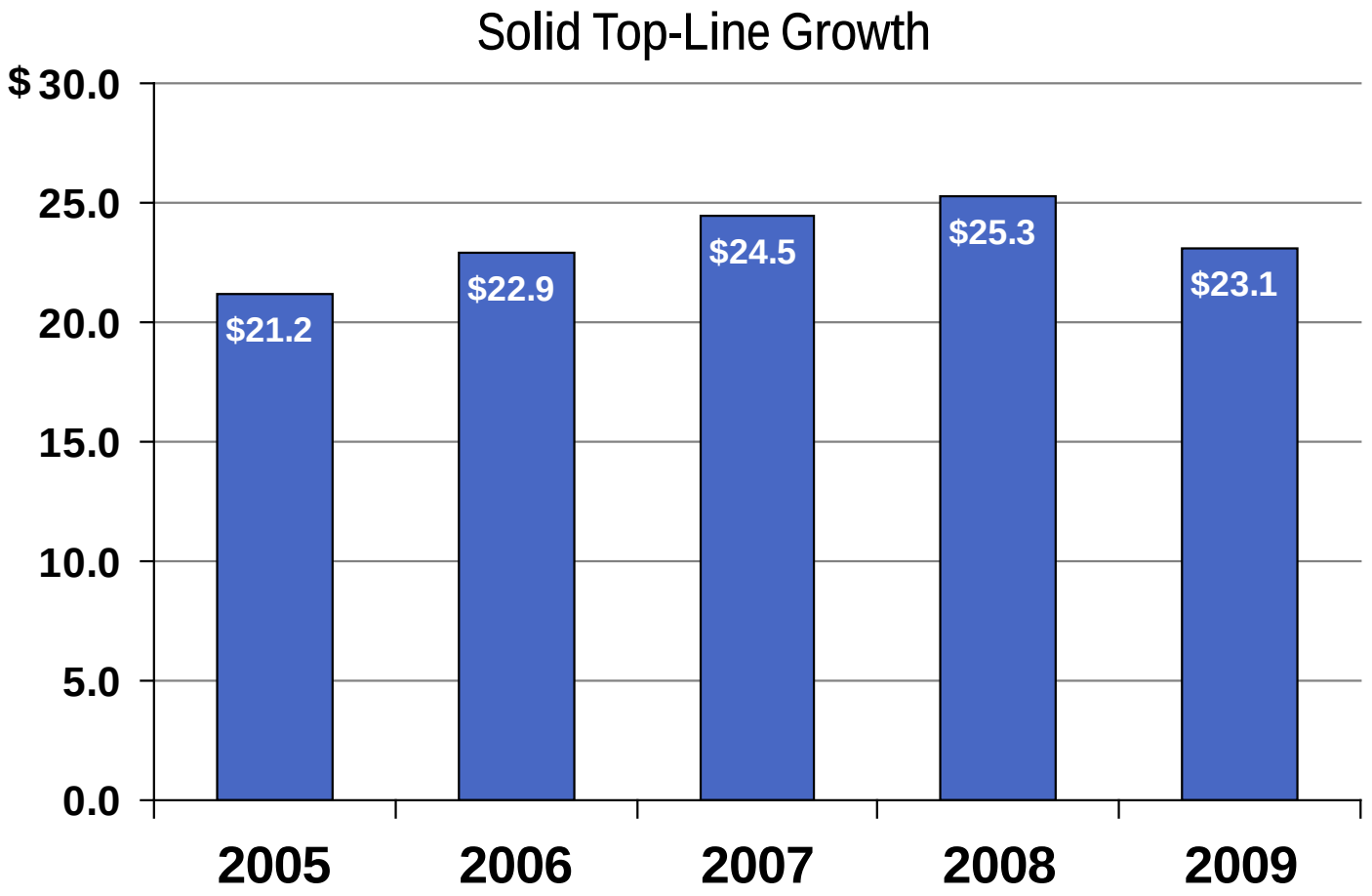
3M - Solving Problems Everywhere

- Operate companies in more than 65 countries
  - 35 international companies with manufacturing operations, 35 with laboratories
  - In the United States, operations in 28 states
- R&D and related expenditures total $6.861 billion for the last five years
- More than 75,000 employees worldwide
- We provide ‘borderless customer success’

3M's Technology Platforms

Ab Abrasives	**Bi** Biotech								**Pm** Polymer Melt Processing	**Sm** Specialty Materials
Ac Acoustics	**Ce** Ceramics	**Em** Electronic Materials					**Nt** Nano-technology		**Po** Porous Materials & Membranes	**Su** Surface Modification
Ad Adhesives	**Dd** Drug Delivery	**Fc** Flexible Converting & Packaging				**Mi** Microbial Detection & Control	**Nw** Nonwoven Materials		**Pp** Precision Processing	**Tt** Track and Trace
Am Advanced Materials	**Di** Display	**Fe** Flexible Electronics	**Fs** Filtration, Separation, Purification	**Is** Integrated Systems Design	**Me** Metal Matrix Composites	**Mo** Molding	**Op** Opto-electronics		**Pr** Process Design & Control	**Vp** Vapor Processing
An Analytical	**Do** Dental & Orthodontic Materials	**Fi** Films	**Im** Imaging	**Lm** Light Mgmt	**Mf** Mechanical Fasteners	**Mr** Micro-replication	**Pd** Particle & Dispersion Processing		**Rp** Radiation Processing	**We** Accelerated Weathering
As Application Software	**Ec** Energy Components	**Fl** Fluoro-materials	**In** Inspection & Measure-ment	**Md** Medical Data Mgmt			**Pe** Predictive Engineering & Modeling		**Se** Sensors	**Wo** Wound Mgmt

Net Sales (billions)



Environmental Results Worldwide

Our progress toward sustainability

- Prevented the generation of 2.9 billion pounds of pollutants since 1975 with more than 7,400 3P projects.
- Cut volatile organic air emissions 95%.
- In 2010 again, received the ENERGY STAR® Sustained Excellence Award for Energy Management.
- 3M reduced absolute greenhouse gas emissions by 69% from 1990-2008.

Making Energy Efficiency

A Competitive Advantage

3M Energy Management

- 3M began its Energy Management Program in 1973
  - 37 years of continuous improvement
- 3M U.S. operations used only 4% more energy in 2009 than in 1973 while U.S. net sales increased nearly 3x.
- Worldwide, 3M's operations have reduced their energy use by more than 40% since 2000 (based on total Btu's used per dollar of net sales).
- Our total energy use in 2009 was 22% less than in 2000
- Greenhouse gas emissions have been reduced significantly.

3M

Environmental, Health and Safety Policy

Corporate Energy Policy

Applies To

This policy applies to all 3M operations.

Introduction

The objectives of this policy are to improve energy consumption efficiency, reduce cost, optimize capital investment for energy efficiency, reduce environmental and greenhouse gas emissions, and conserve natural resources.

Policy Statement

3M will promote the efficient use of energy to produce and deliver products and services to its customers.

Additional Elements

Policy Guidelines:

The following steps should be pursued to support the policy:

- Improve energy efficiency by establishing and implementing effective energy management programs worldwide that support manufacturing capabilities while providing a safe and comfortable work environment.
- Emphasize energy efficiency as a factor in product development and in process and facility design.
- Secure adequate and reliable energy supplies at the most advantageous rates and implement contingency plans to protect operations from energy supply interruptions.
- Encourage continuous energy conservation by employees in their work and personal activities.
- Drive further development of internal and external energy efficient and innovative technologies.
- Cooperate with governmental agencies and utility companies on energy programs.
- Support national governmental energy efficiency policies.

For Further Information

Contact 3M Energy Management, St. Paul, Minnesota, 651-737-4206.

Approved By

Environmental, Health and Safety Committee

3M Energy Management
Building 260-06-N-07
St. Paul, MN 55144

Issued: 08/19/1991
Revised: 12/03/2004

3M

Corporate Energy Policy

Applies To: This policy applies to all 3M operations.

Introduction: The objectives of this policy are to improve energy consumption efficiency, reduce cost, optimize capital investment for energy efficiency, reduce environmental and greenhouse gas emissions, and conserve natural resources.

Policy Statement: 3M will promote the efficient use of energy to produce and deliver products and services to its customers.

Suppliers

Research & Development

Engineering

Environmental

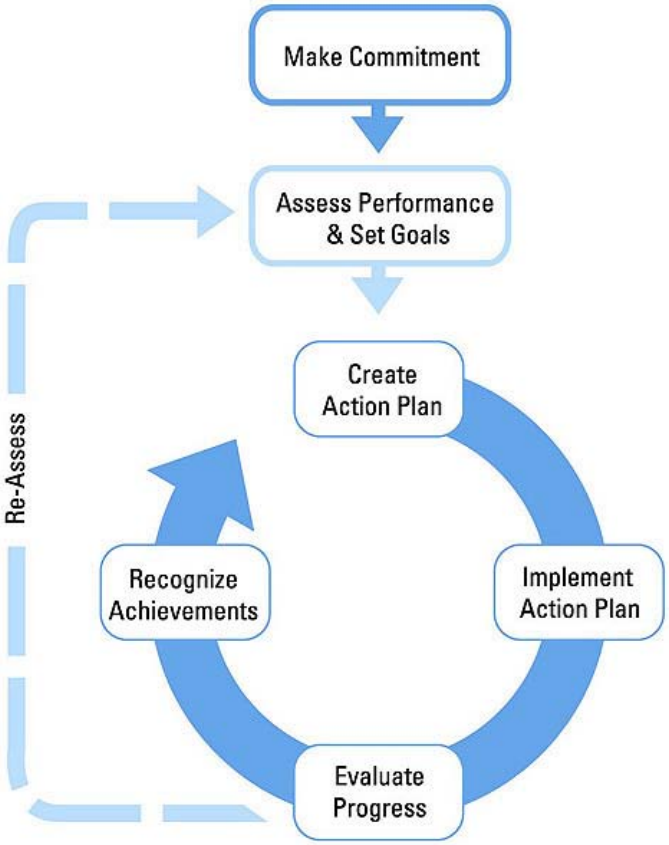
Energy Management

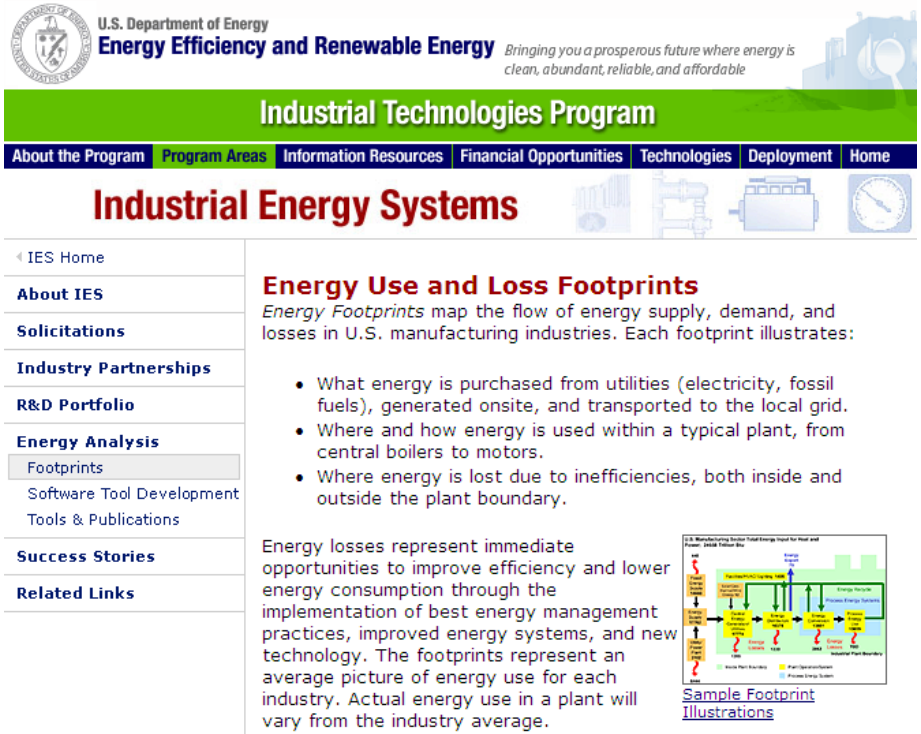
Plant Operations

Sourcing

Customers

ENERGY STAR® and U.S. Department of Energy

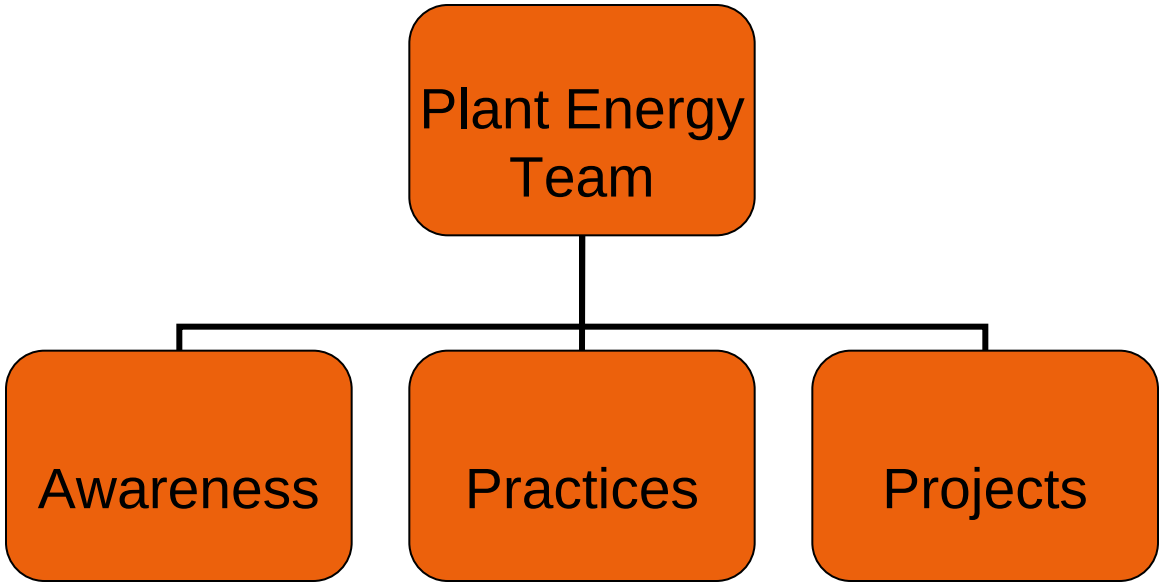




Scope and Structure

- Energy use and costs tracked at over 200 locations world-wide
- Energy teams at each of 56 larger locations
- Management supports teams through annual plans
- Corporate Energy Management provides resources including quarterly progress reports
  - Guidelines for energy teams
  - Best Practice sharing
  - Monthly web conferences
  - Access to experts
  - Assessments
  - Awards and Recognition

Energy Program Guidelines



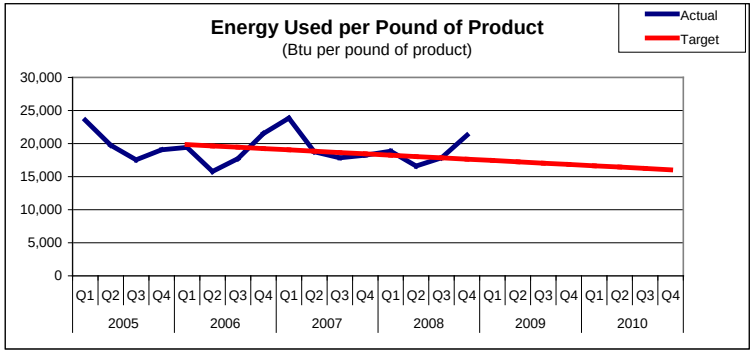
Track Progress

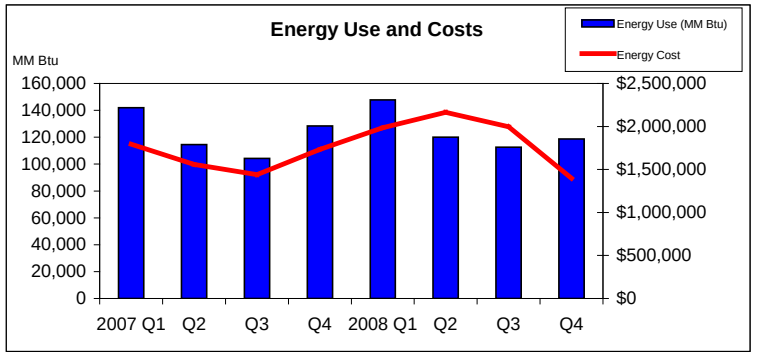
- Site Energy Data System
  - Tracks energy use and cost information for each 3M site world-wide (more than 200 locations)
  - Production inputs from corporate Environmental Targets database
- Energy Cost Reduction Projects database
  - Tracks energy projects being implemented at each 3M location (more than 3,700 projects)
  - Share information on successful projects
- Plant Energy Program Effectiveness Rating
  - Standardized methodology to measure team effectiveness

July 20, 2009

3M Plant Dashboard

	2007 Q1	Q2	Q3	Q4	**2007 Total**	**2008 Goal**	2008 Q1	Q2	Q3	Q4	**Total 2008**
Energy Trend											
Btu/Pound of Product	23,843	18,761	17,845	18,255	**19,617**	**18,833**	18,838	16,593	17,859	21,271	**18,510**
Change[1]						**-4%**	-20.99%	-11.56%	0.08%	16.52%	**-5.64%**
Energy Use (MM Btu)	141,960	114,554	104,194	128,370	**489,079**	**469,515**	147,804	120,083	112,512	118,650	**499,049**
Change							4.12%	4.83%	7.98%	-7.57%	**2.04%**
Energy Cost	$1,792,949	$1,559,032	$1,441,025	$1,732,413	**$6,525,420**	**$6,264,403**	$1,985,083	$2,164,435	$1,996,674	$1,397,109	**$7,543,300**
Change							10.72%	38.83%	38.56%	-19.35%	**15.60%**
Energy Cost per MM Btu	$12.63	$13.61	$13.83	$13.50	**$13.34**		$13.43	$18.02	$17.75	$11.78	**$15.12**
World Class Rating											
Plant Energy Program Effectiveness Rating [2]	90%	90%	90%	90%	**90%**	**85%**	87%	87%	92%	92%	**92%**
Projects											
$ Value of Energy Projects Delivered	$109,772	$63,126	$63,126	$195,181	**$431,204**	**$261,017**	$155,142	$144,899	$144,899	$32,770	**$477,710**
$ Value of Energy Projects Delivered as a % of Plant Energy Spend [3]	6.1%	4.0%	4.4%	11.3%	6.6%	**4%**	7.8%	6.7%	7.3%	2.3%	**7.3%**
$ of Projects Identified, Being Evaluated & Planned	NA	NA	NA	NA	**NA**		$0	$0	$0	$20,369	**$20,369**



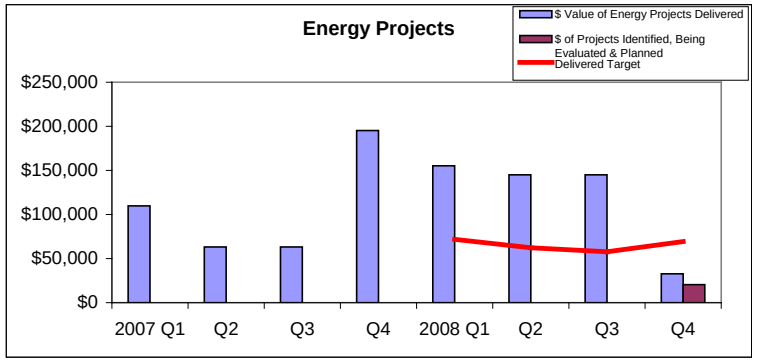


Other Critical Metrics

2008 Energy Costs as a Percent of Total Plant Operating Costs	TBD
Potential Savings From Energy Projects Not Yet Completed	$816,464
Percent Energy Projects Completed	69.26%

Dashboard Color Signals

[1] Green (-4% or more), Yellow (-3.9% - -2%), Red (-1.9% or less)
[2] Green (85% or more), Yellow (70% - 84%), Red (69% or less)
[3] Green (4% or more), Yellow (3.9% - 2%), Red (1.9% or less)

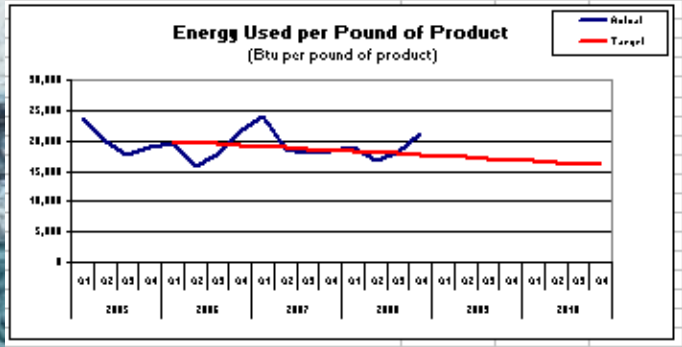


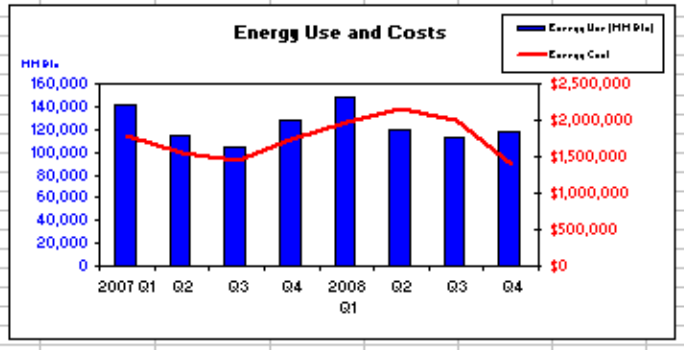
July 20, 2009

3M Plant Dashboard

	2007 Q1	Q2	Q3	Q4	2007 Total	2008 Goal	2008 Q1	Q2	Q3	Q4	Total 2008
Energy Trend											
Btu/Pound of Product	23,843	18,761	17,845	18,255	**19,617**	**18,833**	18,838	16,593	17,859	21,271	**18,510**
Change[1]						**-4%**	-20.99%	-11.56%	0.08%	16.52%	**-5.64%**
Energy Use (MM Btu)	141,960	114,554	104,194	128,370	**489,079**	**469,515**	147,804	120,083	112,512	118,650	**499,049**
Change							4.12%	4.83%	7.98%	-7.57%	**2.04%**
Energy Cost	$1,792,349	$1,559,032	$1,441,025	$1,732,413	**$6,525,420**	**$6,264,403**	$1,385,083	$2,164,435	$1,936,674	$1,397,109	**$7,543,300**
Change							10.72%	38.83%	38.56%	-19.35%	**15.60%**
Energy Cost per MM Btu	$12.63	$13.61	$13.83	$13.50	**$13.34**		$13.43	$18.02	$17.75	$11.78	**$15.12**
World Class Rating											
Plant Energy Program Effectiveness Rating[2]	90%	90%	90%	90%	**90%**	**85%**	87%	87%	92%	92%	**92%**
Projects											
$ Value of Energy Projects Delivered	$109,772	$63,126	$63,126	$195,181	**$431,204**	**$261,017**	$155,142	$144,899	$144,899	$32,770	**$477,710**
$ Value of Energy Projects Delivered as a % of Plant Energy Spend[3]	6.1%	4.0%	4.4%	11.3%	6.6%	**4%**	7.8%	6.7%	7.3%	2.3%	**7.3%**
$ of Projects Identified, Being Evaluated & Planned	NA	NA	NA	NA	**NA**		$0	$0	$0	$20,363	**$20,363**

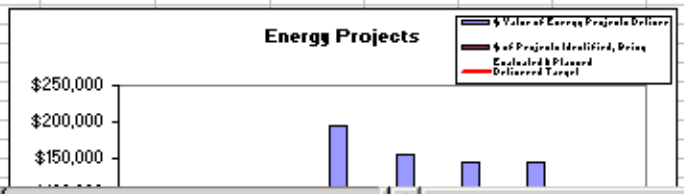
Award Points		
	5	out of 5
	5	out of 5
	5	out of 5
	15	Platinum Level Award
Possible Award Levels:		
Platinum		
Gold		
Silver		
Bronze		





Other Critical Metrics

2008 Energy Costs as a Percent of Total Plant Operating Costs	0%
Potential Savings From Energy Projects Not Yet Completed	$816,464
Percent Energy Projects Completed	69.26%



Dashboard | Summary | Projects | Assessment Worksheet

Energy Recognition Program

- Tier I Locations
- Based on a Point System Using Energy Dashboard Results
- Team Award – Entire Plant Energy Team Qualifies
- Annually
- Self Nomination
  - Tier II Locations
  - Maximum Award – Gold Level

	Dinner	Lunch/Coffee	Certificate
Platinum	Team with Significant Others		X
Gold		Team Box Lunch	X
Silver		Team Coffee, Cookies	X
Bronze			X

Certificates signed by Vice President of Engineering, Director of Plant Engineering, and Corporate Energy Manager

Energy Award Winners 2010*

Platinum	Gold	Silver	Bronze
3M Center	Brownwood	3M Austin Center	Aberdeen
Cynthiana	Decatur	Brookings	Knoxville
	Menomonie	Cordova	Guin
Brockville Tape		Corona	Springfield
Kamen	Beauchamp	Cottage Grove	Hartford City
Kitakami	Hilden	Hutchinson	Stanford Springs
Naju	San Luis Potosi	Little Rock	Tonawanda
Yang-Mei	Singapore Woodlands	Nevada	
		New Ulm	Atherstone
		Pittsboro	Gendorf
		Prairie du Chien	Loughborough
		Aycliff	
		Gorseinon	
		Higashine	
		London Oxford St.	
		Ribeirao Preto	
		Seefeld (3M ESPE)	
		Shanghai Xin Qiao	
		Sumare	

* For results achieved in 2009

Plant Energy Award Winners

3M Sumare, Brazil Energy Team Receiving 2008 Platinum Energy Award from 3M CEO

Energy Award Celebrations

3M Team Accepting 2010 ENERGY STAR Award in Washington, D.C.

Energy Award Celebrations

3M Decatur, Alabama Team Accepting Save Energy Now Award at Gulf Coast Industrial Energy Efficiency Forum

Innovation

3M

NISSAN

ENERGY STAR AWARD 2010
PARTNER OF THE YEAR

Creating an Energy Culture

US Department of Energy
Monthly Webinar Series
June 3, 2010

Save ENERGY Now ®
U.S. DEPARTMENT OF ENERGY LEADER INDUSTRY PARTNERSHIP

Ken Roden
Energy Team Facilitator
Nissan North America

CREATING AN ENERGY CULTURE

- Corporate Philosophy
- Executive Management Support
- Senior Management Participation
- Cross-Functional Teams
- Employee Engagement
- Utilizing External Resources
- Establish & Maintain Team Credibility
- Recognizing Achievement

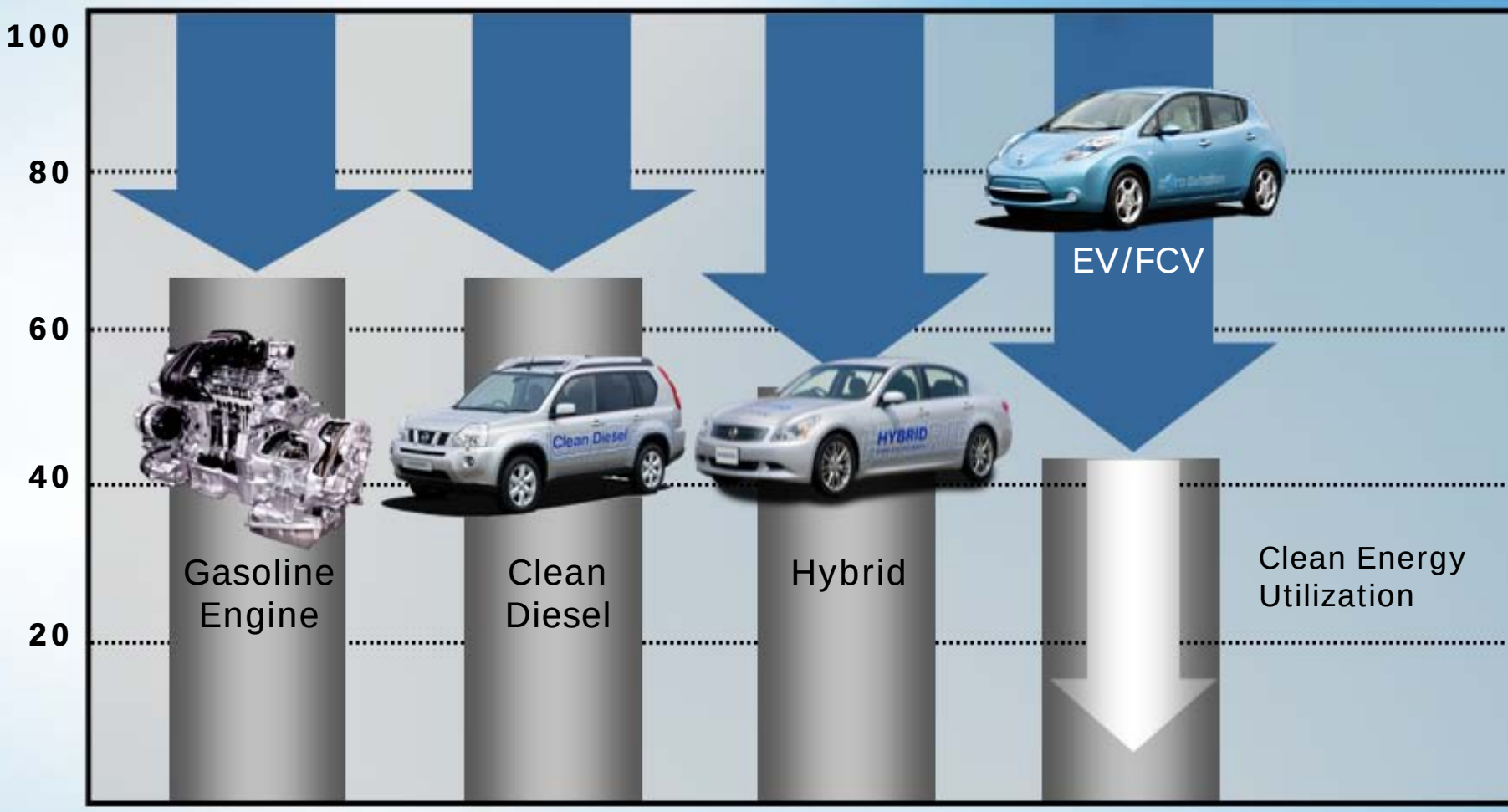
CORPORATE PHILOSOPHY

‘a symbiosis of people, vehicles and nature’

NISSAN
GREEN PROGRAM

CORPORATE CARBON REDUCTION PLAN

EV/FCV are the ultimate solution for zero-emissions



NISSAN LEAF

zero Emission

EXECUTIVE MANAGEMENT COMMITMENT

Carlos Ghosn

President and Chief Executive Officer
Nissan Motor Co, Ltd.

Nissan
Sustainability Report
2009

CEO Statement

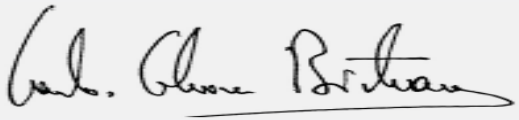
The last year has taken a serious toll on individuals' confidence in the global economy. A series of events that began in the fall of 2008 with the crumbling of the financial system in the United States eventually spread through the entire international banking system, triggering a global recession. The financial and economic crisis has eroded value and created economic setbacks for governments, for financial institutions, for companies in nearly every industry and for individual consumers around the world.

The global economy as a whole—including the automobile industry—is in the midst of an unprecedented, unsettling experience. Against this backdrop, the word "sustainability" takes on new importance. People are particularly interested in what can be counted on to retain its value and in what the future holds.

At Nissan, as we manage through this global crisis, we are holding firm to our belief that it is vital to have consistency between short-term goals and actions and long-term strategy. We are making sure that the intensity of our short-term work to protect the company is not undermining our position in terms of products, technology, people and know-how. This economic turmoil will eventually pass. Even though we may have to retune our vision for the future, immediate challenges will not overshadow that vision.

The current operating environment is testing automakers' ability to balance short- and long-term objectives. At Nissan, we will adapt and make the constant efforts needed to pass the test successfully. Our actions today are designed to help us survive the current crisis and assure the vitality of our company tomorrow.

This report details our efforts. We hope you find it to be an informative roadmap toward our future.



Carlos Ghosn
President and Chief Executive Officer
Nissan Motor Co., Ltd.

SENIOR MANAGEMENT COMMITMENT

NNA – Sustainable Energy Commitment

"Nissan is committed to the sustainable, profitable growth of our company and to the sustainable development of society and the environment. One factor that touches performance on *both* counts is the risk and opportunity associated with energy efficiency. Nissan has made significant progress in establishing a comprehensive, measurable energy management program that is reducing environmental impacts, controlling energy costs, improving operational efficiency and reducing internal energy risk. In fact, we will reduce our energy use by 30% over the next four years. Corporate energy efficiency is a sustainable practice *and* good business."

NISSAN

William J. Krueger
Nissan North America, Inc.
Senior Vice President
Manufacturing, Purchasing, Supply Chain Management and Total Customer Satisfaction

CROSS-FUNCTIONAL TEAM

Manufacturing

Communications

Engineering

Finance

Maintenance

Legal

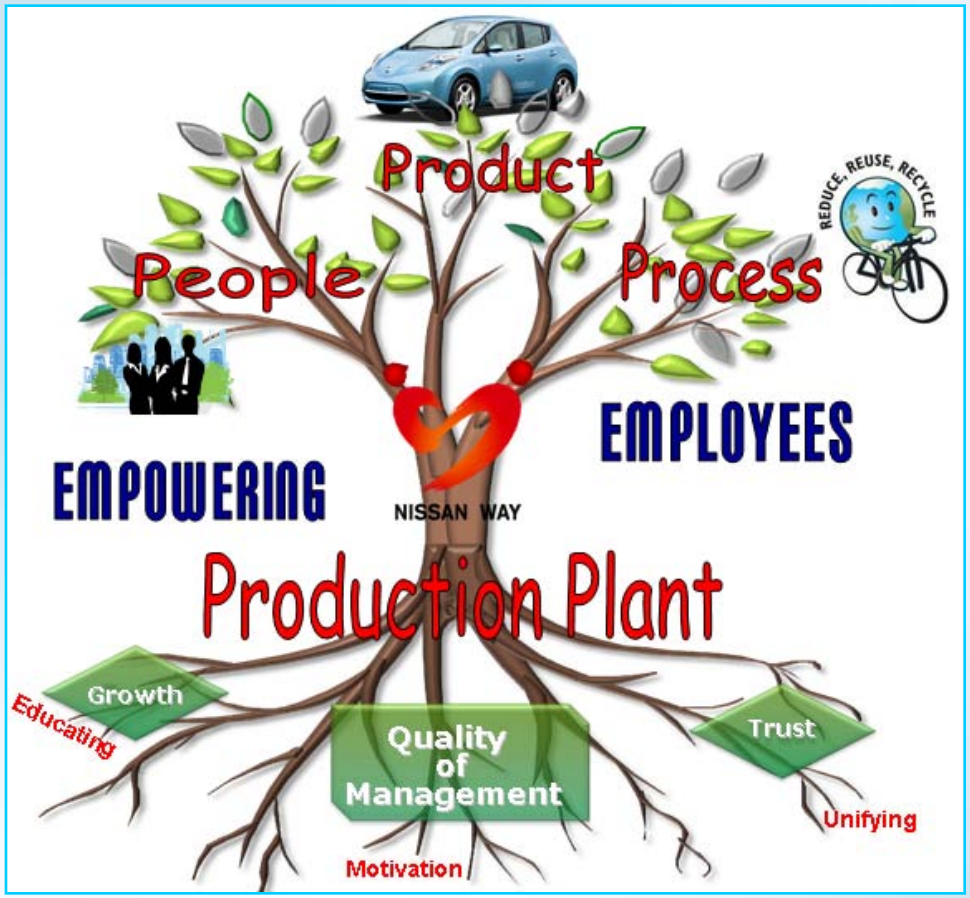
Purchasing

Suppliers

Environmental

"The power comes from inside"

EMPLOYEE ENGAGEMENT



Employee Engagement is the difference in both accelerating and sustaining the business case of a sustainable workforce.

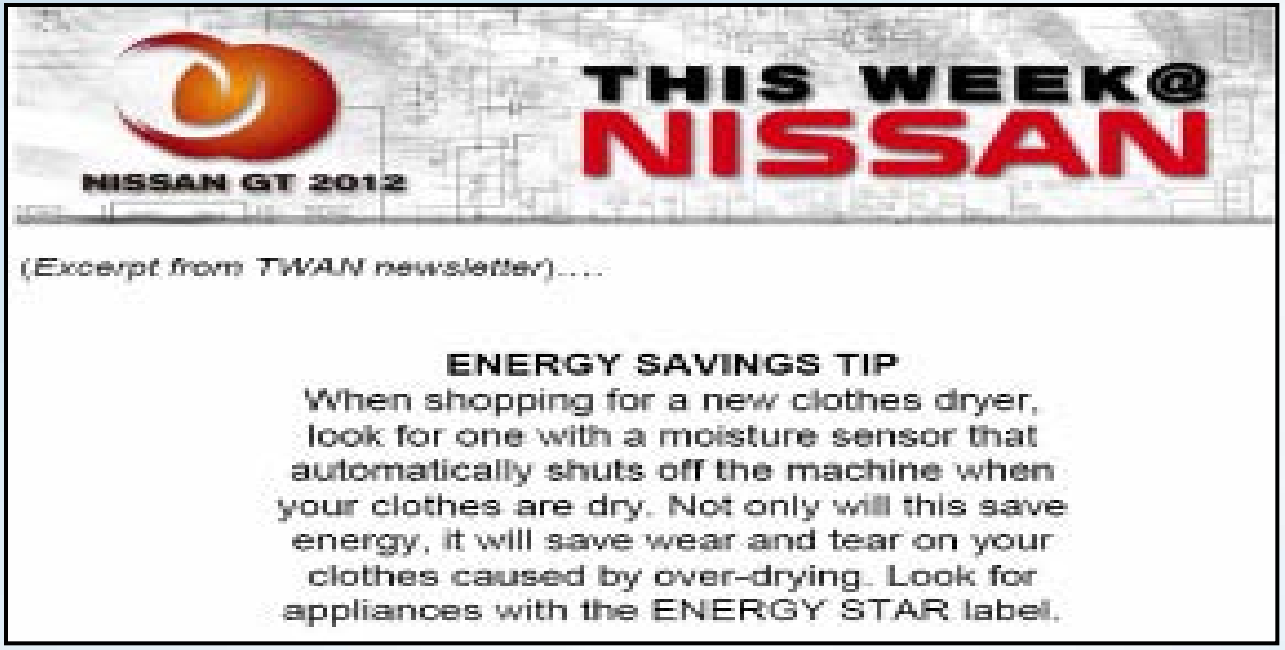
EMPLOYEE ENGAGEMENT

Energy Awareness Meetings for Employees

***Information**:*

- *corporate energy program*
- *employee contributions*
- *employee participation*
- *resources for home*

EMPLOYEE ENGAGEMENT



EMPLOYEE ENGAGEMENT

EMPLOYEE ENGAGEMENT

EARTH DAY EMPLOYEE FAIR

RESOURCE UTILIZATION

Save Energy Now & ENERGY STAR®

UTILIZE ENERGY STAR® TOOLS

2010 PARTNER OF THE YEAR

Save Energy Now LEADER

Industrial Technologies Program

Save Energy Now

Industry
LEADERS
are reducing their
energy intensity
by 25%

Take the
Pledge

Taking the pledge will establish your company as a *Save Energy Now* LEADER.

Lower your energy bills while helping to meet national energy and climate goals.

Save ENERGY Now®

U.S. DEPARTMENT OF ENERGY
LEADER
INDUSTRY PARTNERSHIP

ENERGY ASSESSMENTS

U.S. Department of Energy - Energy Efficiency and Renewable Energy
Industrial Technologies Program - Save Energy Now

Plant Assessment Summary: Nissan North America, Inc. - Smyrna

The following plant assessment was conducted under Save Energy Now, an effort of the DOE Industrial Technologies Program. Save Energy Now helps industrial plants improve energy efficiency and productivity.

Company	Nissan North America, Inc.
Location	Smyrna, TN
Industry type	Automotive
Assessment type	Pumps
Energy Expert	Don Casada
Assessment date(s)	November 29, 2007
ESA ID number	ESA-245-2
For further information	If you have questions about this assessment or wish to receive additional information, please contact the Webmaster.

ITP RESOURCES

Information Resources

Thursday Webcasts for Industry

Here you will find information on the Industrial Technologies Program (ITP) Thursday Webcasts for Industry, including past presentations.

Register for Upcoming Webcasts >

ITP's Thursday Webcasts for Industry help industrial personnel learn about ITP's software assessment tools, technologies, partnership opportunities, *Save Energy Now* energy assessments, and other resources that can be used to find ways to save energy and reduce carbon emissions. The Webcasts are held on the first Thursday of every month from 2:00 to 3:00 p.m. Eastern time and are presented by ITP staff, partners, and experts.

You can register to participate in upcoming Thursday Webcasts by visiting the ITP events calendar or best practices training calendar. Each entry includes the Webcast's date, topic, and registration link, and provides a detailed description of the Webcast.

Save Energy Now LEADER ACTIVITIES

ITP RESOURCES

Industrial Technologies Program

Save Energy Now

Resources

Below are links to Save Energy Now resources companies can use to identify savings opportunities and reduce energy intensity 25% in 10 years.

Industrial Energy Management Resources and Tools CD

This free CD features software tools, tip sheets, fact sheets, and case studies to help manage process heating, steam, and motor-driven systems, as well as data centers. Get information on energy assessments, learn how to partner with Save Energy Now, and discover energy-saving emerging and commercialized industrial technologies. The CD is easy to use and is especially ideal for facilities that are unable to access the Internet. To order your copy, contact the EERE Information Center online or by calling 1-877-EERE-INF (1-877-337-3463).

Software Tools Online

Download free Industrial Technologies Program (ITP) software tools to analyze the energy situation at your plant and improve industrial compressed air, motor, fan, pump, process heating, and steam systems.

Training

Look for training to enhance your knowledge about energy efficiency, decrease maintenance and downtime, and boost industrial system performance. Webcasts and workshops are offered on steam, process heating, compressed air, fans, motors, and pumping systems. ITP also offers no-cost Thursday Webcasts on topics such as assessments, technologies, and tools.

Publications

Keep pace with energy management best practices and advancements in industrial energy efficiency technologies through publications such as sourcebooks, technical fact sheets and handbooks, tip sheets, and online news.

REGIONAL COALITION

The Southeast Energy Efficiency Alliance
Industrial Coalition

- Collaborative forum to exchange best practices, foster education, drive improvement, implementations

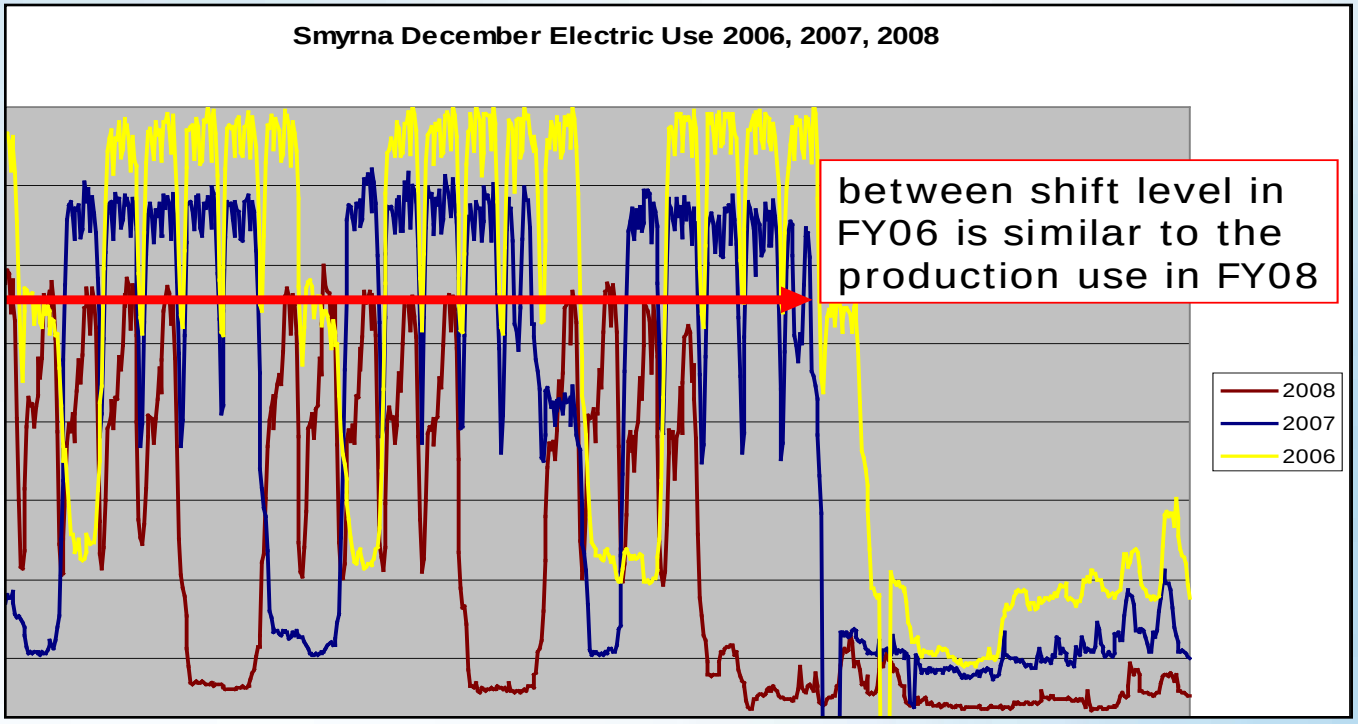
- Industries, utilities, state energy offices, industrial assessment centers & national labs

seea
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

ESTABLISH & MAINTAIN CREDIBILITY

Establish & Maintain Credibility

- measurement & verification
- start with management
- performance data
- express in relative terms



COMMUNICATING SUCCESS

Communicate Success to Employees

- specific meetings & events
- utilize internal networks & media
- relay everyone's contributions
- engage participation

RECOGNIZING ACHIEVEMENT

Save Energy Now LEADER SHOWCASE

Save Energy Now LEADER SHOWCASE

THANKS

Questions