Nissan North America, Inc.: Creating an Energy Culture

Ken Roden, Nissan North America, Inc.

ABSTRACT

Establishing an energy culture is a key component of achieving true energy awareness and efficiency. For Nissan North America, Inc. (NNA), this means implementing corporate-wide social responsibility policies that focus on sustainability. It also means ongoing commitment to improving energy performance, lowering energy intensity 25% over a 10-year period, providing resources and information to meet energy use targets, and meeting and maintaining compliance with legal and energy performance requirements. This paper will also provide an overview of NNA's corporate energy management approach, strategies for promoting and cultivating a corporate culture of energy efficiency, engaging employees, strategic partnerships, and critical tools and resources.

The Nissan Motor Company – Corporate Philosophy

Founded in 1933 in Yokohama City, Japan, the Nissan Motor Corporation (Nissan) currently supports vehicle manufacturing operations in 20 countries worldwide. Today, Nissan is not only one of the largest manufacturers of vehicles in the world, but a global leader in sustainability and environmental initiatives. With its recent U.S. launch of the zero emissions, 100% electric Nissan LEAF ™, the company continues to deliver innovative products to the market that secure Nissan as a 21st century, sustainable manufacturer and a true 'eco-innovator.'

Nissan's North American operation, Nissan North America, Inc. (NNA), began manufacturing in the United States in 1983 and currently operates three production plants in the Southeast – vehicle assembly plants located in Smyrna, Tennessee, and Canton, Mississippi, and a powertrain assembly plant located in Decherd, Tennessee. These facilities have developed an extensive energy management system that incorporates the company's commitment "to the creation of a sustainable mobile society" and champions environmental stewardship and energy awareness.

Nissan's corporate philosophy centers on robust corporate social responsibility (CSR) policies that promote a culture of sustainability throughout the company. In the opening statement of the company's 2010 sustainability report, Nissan's President and Chief Executive Officer, Carlos Ghosn, highlighted Nissan's desire to continue its efforts to create new and innovative products to deliver to the marketplace. To do this, Nissan subscribes to short-term strategies that "build and reinforce sustainable business objectives over longer periods." These strategies aim not only to create sustainability in the marketplace, but to promote a company-wide culture of energy awareness and efficiency that actively engages employees as a critical component of Nissan's philosophy.

Cultivating a Corporate Environment – the Nissan Way

Nissan's commitment to sustainability is present at all levels of the corporation and is a pillar of its environmental philosophy: Symbiosis of People, Vehicles, and Nature. Nissan

underlines this commitment through the cultivation of an environment that focuses on mindsets and actions. This entails fostering a cross-functional, cross-cultural business approach that welcomes diversity, advocates transparency, promotes the idea of a "learning company," and encourages employees to be passionate and creative in their work.

The 'Nissan Way' focuses on keeping Nissan competitive through continually benchmarking and measuring both performance and success, focusing on "the want-to-be condition" and achieving maximum results by utilizing the most cost-effective resources available. The 'Nissan Way' creates a corporate environment that not only motivates and challenges its employees to drive continuous and competitive progress across the company, but one that reinforces a culture of sustainability.

The Nissan Green Program

To further its commitment to a sustainable mobile society and to lessen the environmental impact of Nissan's business and manufacturing activities, Nissan introduced the Nissan Green Program. A vision of the company's executive leadership, the program is "a mid-term environmental action plan"[1] that establishes initiatives to reduce harmful carbon emissions, preserve the earth's atmosphere and natural resources, and recycle resources (reduce/reuse/recycle[2]).[3] The Nissan Green Program forms the large corporate umbrella under which all sustainability activities fall. The Program complements the company's environmental philosophy and seeks to firmly establish Nissan as a 21st Century sustainable manufacturer, a "sincere eco-innovator," and the most trusted car company in the Americas.[4]

NNA's Energy Policy

Nissan is committed to "the development of a comprehensive, measurable energy management program to reduce the energy burden, cost, and risk in the manufacturing of all its products."[5] Energy management and awareness is viewed as the responsibility of not only management, but of all employees as well and at the company's North American production plants, all on-site contractors and suppliers are accountable for energy management.

NNA has developed an extensive energy management policy that reinforces their commitment to environmental stewardship and energy awareness. This policy states that NNA is committed to:

- Continually improving energy performance
- Achieving a 25% reduction in energy intensity in 10 years
- Providing available information and necessary resources to meet energy use objectives and targets

[1] "Nissan Green Program 2010," http://www.nissan-global.com/EN/ENVIRONMENT/GREENPROGRAM_2010/index.html
[2] Also referred to as the 3R Campaign.
[3] "Nissan Green Program 2010," http://www.nissan-global.com/EN/ENVIRONMENT/GREENPROGRAM_2010/index.html
[4] Conversation with Ken Roden, February 25, 2011.
[5] "ENERGY POLICY," Nissan North America, Inc.

- Meeting and maintaining compliance with applicable legal requirements, as well as with any other energy performance requirements to which the company subscribes
- Supporting the purchase of energy efficient equipment and systems, as appropriate.[6]

Corporate Energy Management – Our Approach

Executive Support

Support at all levels of management is critical for sustaining the success of an energy management system. NNA's executive management assumes an active role in the cultivation of Nissan's energy culture. They believe energy awareness is critical at all levels in the organization, viewing the maintenance of Nissan's commitment to reducing overall CO_2 emission levels as an integral part of their jobs. Nissan's management team not only provides leadership and direction, but serves as key motivators, educators, and most importantly, as direct contributors to energy management. They provide incentives, resources, and the financing and approvals necessary for programs, projects, and initiatives. Vice Chairman for Nissan Americas, Bill Krueger, participates in Energy Team Meetings and award ceremonies, and actively supports energy efficiency initiatives company-wide.

Competitiveness Teams to Ensure Leadership

In early 2007, Mr. Krueger commissioned the formation of corporate, cross-functional Manufacturing Competitiveness Teams or MCTs. These teams were tasked with ensuring the company remains competitive in both U.S. and global markets. NNA continues to utilize the cross-functional approach of the MCTs that focuses on working together to strengthen NNA's manufacturing competitiveness. Mr. Krueger serves as the formal leader of each team. He appointed sub-leaders from various plants as the functional leadership. The concept is to have the business unit with the greatest consumption be responsible for finding ways to reduce their costs and improve competitiveness.

The Nissan Energy Management Team

The Utilities MCT was the first manufacturing competitiveness team to be formed by Mr. Krueger. This team now serves as NNA's Energy Management Team. He commissioned the team to "reduce energy consumption, minimize waste, and more efficiently manage energy resources through the use of new innovations and by challenging conventional methods of operation." Since paint plants are typically responsible for the majority of energy consumed in the auto manufacturing process, Mr. Krueger appointed the director of the Smyrna paint plant[7] as the sub-leader of the utilities team. In its first year, targeting "low-hanging" fruit and implementing no-cost energy saving measures, such as turning off machines and shutting down process operations when not needed, the team reduced NNA's overall energy consumption by over 11%. After benchmarking these initial successes in 2006, the team was challenged to reduce NNA's energy use by an additional 30% over four years, starting in 2007. To meet their new

[6] "ENERGY POLICY," Nissan North America, Inc.
[7] This plant consumes the majority of energy used in Smyrna's production processes.

ambitious goal, the team implemented weekly meetings, weekly performance scorecards, monthly performance reporting metrics, and weekend energy planning. They integrated non-manufacturing departments into the team and incorporated their energy use into reporting metrics. Team activities and information was also incorporated into the NNA Monthly Executive Energy & Environmental Meeting which reports directly to Mr. Krueger and other senior management representatives.

The 30% reduction goal was met in mid 2008, just before the global economic crisis. With greatly reduced product volumes in each plant, the team determined that to ensure the accuracy of their performance measurements, a shift from measuring absolute energy reduction was needed. They began focusing on the reduction of energy intensity instead, which proves to be more accurate and consistent, and normalizes measurements between sites.

Today, the Nissan Energy Management Team includes a full-time facilitator to coordinate initiatives and a steering committee to focus energy management objectives. This cross-functional team approach continues to be their greatest strength and resource. Representatives from NNA's manufacturing, engineering, maintenance, purchasing, environmental, communications, finance, legal, safety, and suppliers departments represent their respective business units. With ambitious goals, dedicated team members, and the support of executive management, the Nissan Energy Management Team has become a keystone of NNA's sustainability strategy.

Strategies for Cultivating and Promoting a Corporate Culture of Energy Efficiency and Engaging Employees

Achieving energy efficiency in its manufacturing and non-manufacturing operations is a critical component in Nissan's quest to become a 21st century sustainable manufacturer and a steward of corporate citizenship. Nissan believes that to be successful, it must engage its employees in energy practices and create a culture of energy efficiency that centers on an employee-driven energy management system.

Behavior-Based Sustainability

NNA's implementation of a behavior-based sustainability model as a business best practice underlies the company's manufacturing operations and its belief in employee-driven energy and environmental systems. Behavior-based sustainability relies on a top-down support/bottom-up innovation approach to engage employees. As a model, behavior-based sustainability encourages employees to take ownership in NNA's environmental stewardship and makes sustainability a personal responsibility by incorporating employee stewardship into the model. The model focuses on education, integration, and implementation of actions that provide employees with a framework through which they can communicate and innovate – in the workplace, at home, or in their communities. By creating action-oriented, data-driven processes that place the user at the center of the design process, Nissan is able to evolve its organizational intelligence, while concentrating on continual improvement and the delivery of new products to the market.

Employee Engagement

Nissan recognizes that power of its employees is the most important resource for creating and maintaining a successful corporate energy management system. Accordingly, the NNA Energy Management Team actively encourages Nissan employees to participate in energy programs and challenges them to develop resourceful ways to save energy. The Team provides educational opportunities that teach both technical and non-technical staff easy ways to conserve energy and identify energy savings opportunities. They also highlight the importance of corporate citizenship and building networks, especially through the company's communications and public relations departments, to promote their energy successes.

Nissan emphasizes to employees that the reduction of energy intensity is, in fact, a core business function. NNA's Energy Management Team works throughout the organization to create a cross-functional, fundamental network that supports and promotes energy awareness. They work to ensure that plants understand the value of energy efficiency in their operations and sees to it that all employees are able to present their management with a solid business case for any proposed energy projects that require capital. They seek horizontal deployment of energy best practices to regional and global Nissan plants, suppliers, and to other U.S. peer companies as well.

Further, the Energy Management Team supports Nissan's 21st Century Sustainable Manufacturing Initiative by collaborating with the plant's shop floor Green Teams, a program that incorporates green initiatives into the Nissan culture. Modeled after the company's safety awareness program, each work group has a Green Team technician who serves as an environment/energy representative. This approach has provided NNA's Energy Management Team with another avenue through which it can engage employees.

NNA regularly sponsors employee Earth Day Fairs, Energy Fairs, and Family Day Fairs that provide employees and their families with access to key residential sustainability professionals. These resources help to educate employees and support them in making more informed decisions regarding their personal energy efficiency and environmental stewardship commitments. Nissan believes that encouraging efficiency at home creates a continuous, cyclical pattern – if employees are practicing efficiency at home, they will be more energy conscious and innovative at work.

Management Awareness, Ownership, & Accountability

Management awareness, ownership, and accountability play a significant role in Nissan's overall Hoshin-Kanri or business plan methodology. Nissan has incorporated sustainability and energy into its Environmental Key Performance Indicators (KPIs) for management. Including these metrics in performance reporting ensures that management is held accountable for energy efficiency and project implementation.

Additionally, Nissan has shifted the responsibility of manufacturing energy budgets to manufacturing managers within each shop. This paradigm shift ensures that costs are controlled and that energy consumers are not only aware of their consumption, they are responsible for it. It also encourages plant management to more actively engage the shop floor in discussions about energy and ways to improve efficiency.

Communication

Nissan places great value on communication, both internal and external. Communication is one of the most important strategies in the creation of a successful energy management system. Good communication generates awareness and enthusiasm for energy programs and initiatives, establishes internal credibility, and acknowledges employee achievements. It builds a company's external reputation and publicizes its successes.

NNA utilizes readily available, internal communication tools, such as e-mail, screen-savers, the company intranet, weekly and monthly newsletters, 'GO and SEE' events, NTV (the company's internal TV network), and forums such as company events and presentations to heighten energy awareness and promote its programs. They have also incorporated Energy & Environmental Awareness Training into their existing online corporate training modules through the Nissan Virtual Academy.

In addition, to reinforce proactive behavior, NNA consistently recognizes employees who have made an energy difference, in the workplace and beyond. The Energy Management Team regularly presents employees with recognition or awards at Energy Team meetings and company events. NNA also recognizes their plants for outstanding achievements in energy efficiency.

Activities and energy successes are also publicized externally. NNA takes advantage of awareness opportunities, such as alerting the media of an event or success story, incorporating energy into facility tours, and sponsoring and participating in energy meetings and conferences.

Our Partnerships

NNA views its corporate partnerships as central to its success in industry, as well as valuable to the credibility of its energy management program. NNA has partnered with federal agencies, regional organizations, local utility providers, universities, and industry peers. These partnerships provide NNA with valuable resources that the company uses to strengthen and promote its program, educate and engage its employees, and network with its counterparts in industry.

Environmental Protection Agency (EPA) – ENERGY STAR® Program

NNA has been an Environmental Protection Agency (EPA) ENERGY STAR Partner since 2006 and actively promotes this partnership throughout its supply chain and industry peers. Nissan adheres to the ENERGY STAR guidelines for energy management and utilizes ENERGY STAR resources to assess its energy management program, engage employees, and measure performance with the program's energy management tools. Nissan leverages the recognition factor of the ENERGY STAR logo and utilizes it within energy documents and promotional materials company-wide.

Nissan also actively supports the Motor Vehicle Focus within the industrial sector of ENERGY STAR. With this partnership, the automobile manufacturers work together to collaborate, benchmark and share best energy efficiency practices among the group's members and supply chain companies.

NNA facilities in Smyrna, Tennessee, and Canton, Mississippi, and its headquarters in Franklin, Tennessee are ENERGY STAR labeled facilities. The company targets having more of its non-manufacturing facilities ENERGY STAR labeled each year. NNA participates in the

ENERGY STAR Challenge for Industry which recognizes plant sites that reduce energy intensity by 10% within five years, such as its Powertrain plant in Decherd, Tennessee. In 2010 and 2011, NNA was named ENERGY STAR Partner of the Year for its innovative approach to energy management.

U.S. Department of Energy's Industrial Technologies Program – *Save Energy Now* LEADER Program

NNA has also partnered with the U.S. Department of Energy's (DOE) Industrial Technologies Program (ITP). Nissan became a *Save Energy Now* LEADER Company in the fall of 2009, pledging to annually reduce its industrial energy intensity by 25% in 10 years. NNA utilizes ITP's tools and resources to conduct energy assessments, implement projects, and communicate the importance of energy efficiency in industry.

In April 2010, NNA hosted the first *Save Energy Now* LEADER Showcase at its Smyrna, Tennessee plant. This event highlighted Nissan's corporate energy management system and brought together leaders from industry, government, private sector, and academia. More than 100 attendees were given a tour of the Smyrna facility and its plants' operations. NNA shared company best practices and demonstrated various energy efficiency projects that have achieved considerable energy savings at the plant. The showcase event also highlighted ITP's activities with manufacturers throughout U.S. industry, as well as the benefits of becoming a *Save Energy Now* LEADER Company.

Southeast Energy Efficiency Alliance (SEEA) – Industrial Coalition Program

Since 2009, Nissan has been an active participant in the SEEA Industrial Program's Regional Coalition. This coalition works to increase energy efficiency awareness in the Southeast and to build a partnership among industrial stakeholders in the region. On February 16, 2011, Nissan hosted a SEEA Industrial Coalition event – the Program's quarterly meeting – at its Canton, Mississippi facility. In addition to highlighting ways to improve facility energy efficiency, Nissan discussed the facility's recycling efforts and community activities.

These events provide a forum for companies to interact and share industry best practices with their peers from across the region and connect them to members from regional utilities, state agencies and energy offices, national laboratories, and industrial assessment centers. They focus on driving improvement and implementation of energy efficiency in industry. Nissan is an active member of this partnership and is committed to the program's growth.

Supply Chain Energy Program

NNA highly values energy efficiency and sustainable manufacturing throughout its supply chain. It demonstrates a continued commitment to helping their suppliers manage their energy and support their initiatives.[8] NNA also hosts an annual conference to promote energy efficiency among its top suppliers. The conference features local, state, regional and federal resource providers who can assist suppliers with energy management and advise them on

[8]2010 ENERGY STAR Award Recipients. "Nissan North America, Inc., 2010 winner of Partner of the Year Energy Management," http://www.energystar.gov/index.cfm?c=industry.bus_award_recipients_2010.

industry best practices. NNA utilizes lean manufacturing advisory teams that visit supply chain companies and assist them with productivity and efficiency improvements. These teams are also trained to look for energy efficiency improvements and offer assistance and guidance from the Nissan Energy Team.

Local Communities

Nissan is committed to the enrichment of lives and strongly encourages its employees to engage with their communities. Since 2007, Nissan employees from the Smyrna, Tennessee facility have been building houses as volunteers with Habitat for Humanity. In Rutherford County, Tennessee, the Smyrna operation builds one home per year. NNA works with the Habitat program to build energy efficient houses that are ENERGY STAR certified. Signage is placed outside of the homes to raise public awareness and promote energy efficiency. In Central Mississippi, NNA employees from the Canton, Mississippi facility work with K-12 grade schools to advise them on energy efficiency. Nissan's engineering staff assisted three Mississippi schools to achieve ENERGY STAR labeling in 2010.

Our Tools

In addition to practicing lean manufacturing, the "Nissan Way" and driving continuous and competitive improvement across the company, NNA utilizes a variety of tools in its energy management system. These tools not only enable Nissan to measure and benchmark critical energy use data, but to better understand energy consumption and develop metrics.

Measurement and Verification (M&V)

NNA incorporates the Nissan Energy Management and Control (NEMAC) system to measure, report and archive energy consumption. NEMAC is a Nissan custom-made, intranet-based platform that allows users to call up data on all of NNA's different commodities in real-time to generate reports and analyze current activity. The NEMAC tool is used to produce energy consumption reports and real-time functions that advise and help to prevent excess consumption or energy waste. NEMAC is a fundamental measurement and verification tool that provides the awareness necessary to manage energy efficiently and effectively.

NEMAC also generates the data necessary for weekly energy reports containing scorecards that reflect weekly energy performance by each plant. These scorecards provide plant management with valuable metrics to manage their energy consumption in the short term and ensure their monthly targets and budgets are met.

Energy Assessments

NNA places a high value on energy assessments, recognizing that they are key to the discovery of energy projects and best practice identification. In addition to performing internal energy assessments, NNA has conducted multiple energy savings assessments through its partnerships with DOE's *Save Energy Now* program. Assessments are necessary to ensure that a

company's processes, equipment, and systems are functioning properly to identify and capture all energy savings opportunities. NNA often refers to their internal assessments as an "energy blitz."

As a result of energy assessments, management walk-throughs and general energy awareness initiatives from team members, NNA has implemented numerous energy saving measures. The company installed light switches that allowed lighting in specific areas to be turned off when not in use and replaced its 400-watt fixtures with efficient 175/250-watt fluorescents. NNA also implemented variable speed drives for electric motors on many fan and pump applications. Additionally, Peak Demand Management was addressed by assessing demand levels and rearranging forging manufacturing operations at its powertrain plant. Tools and strategies such as these enable NNA to focus on data-driven decisions and resource utilization to maintain and sustain a viable and effective energy management system.

Our Commitment to the Future

Moving forward, Nissan remains committed to building a sustainable mobile society. Since 2006, Nissan's Energy Management Team has been committed to "the development of a comprehensive, measurable energy management program to reduce the energy burden, cost, and risk in the manufacturing of all its products."[9] They have championed the cause of energy awareness at the company, with their industrial peers, and in their facilities' communities. Through its integrated efforts to grow the energy management system, reduce industrial energy intensity, build partnerships, and expand involvement with local communities, Nissan will continue its pursuit of environmental stewardship and the creation of a symbiosis of people, vehicles, and nature.

[9] ENERGY POLICY," Nissan North America, Inc.