



# Motivating and Driving Facility Energy Performance

**July 23, 2008**

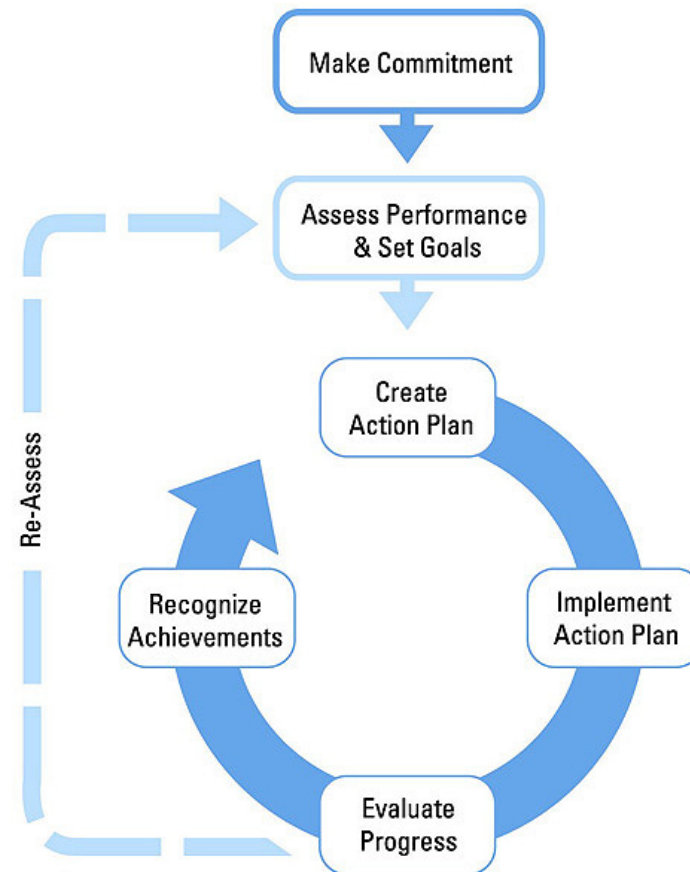
Call-in Number: 1-866-299-3188

Conference Code: 202 343 9965

# About The Web Conferences



- **Monthly**
- **Topics are structured on a strategic approach to energy management**
- **Opportunity to share ideas with others**
- **Slides are a starting point for discussion**
- **Open & Interactive**



# Web Conference Tips



- Mute – To improve sound quality, all phones but the presenters will be muted.
- Use **# 6 to un-mute** and **\* 6 – to mute**
- Presentation slides will be sent by email to all participants following the web conference.

# Today's Web Conference



## Motivating and Driving Energy Performance

- **Dennis Thurman – Transwestern**
- **Bhaskar Dusi – Cemex**
- **Question & Discussion**
- **Announcements**



GUIDING THE PATH TO GREEN

July 23<sup>rd</sup>, 2008

# Motivating and Driving Facility Energy Performance

An ENERGY STAR Energy Management Networking Web Conference

## GUIDING THE PATH TO GREEN

- What Transwestern does internally to educate and motivate it's employees in Energy Management Strategies
- Energy Star Benchmarking
- Establishing an Energy Team
- Education
- Sustainability Operating Committee
- Putting Procedures into Practice
- Participating in Energy Star Policies
- Sharing Industry Data
- Assessing Performance
- Other Services Rendered
- About Transwestern
- Resources



## GUIDING THE PATH TO GREEN



**GREEN FACT:** We can eliminate \$1 billion a year in wasted electricity if we turn off power strips when they are not in use.

## ENERGY STAR BENCHMARKING

Since 1999, Transwestern has been involved in the Energy Star Program. Through partnerships with the Environmental Protection Agency (EPA) and the U.S. Green Building Council (USGBC), we continue to prove the business case for green everyday.

Our approach is simple: We believe in the integration of sustainable building and operational measures into standard business practices.

# GUIDING THE PATH TO GREEN

## Establishing an Energy Team

At the highest levels of leadership, Transwestern is focused on and committed to the ENERGY STAR program and Sustainability as a whole.

The Goals and plans set by the Sustainability Committee are championed throughout the firm by a team of established senior engineering leaders who oversee the individual building engineers in these practices throughout their respective regions



- Begins benchmarking buildings in 1999
- 2004 – 2005 ENERGY STAR® Partner of the Year
- 2006 – 2008 ENERGY STAR Sustained Excellence
- 224 buildings currently ENERGY STAR benchmarked
- 1000+ benchmarked in the last nine years

**GREEN FACT:** Consider buying only ENERGY STAR® labeled computers. The low power mode they adjust to when not in use reduces energy consumption by up to 70%.





# GUIDING THE PATH TO GREEN



**GREEN FACT:** If just 10% of us would keep our cell phone or BlackBerry for 3 years before replacing it, we could save an average of 5.2 million phones from disposal each year.

## Education

At TW we strive to not only stay ahead of the curve on the most current environmental issues, but to actually lead by example through education and innovation.

- TW Trains our employees internally in ENERGY STAR and energy efficiency procedures. We have ongoing Energy Star & LEED classes available through webinars and posted on our internal web-site.
- Transwestern also participates and helps train Energy Efficiency classes through the BOMA BEEP program, BOMA International Conferences, Realcomm Conferences, IREM and other Real Estate affiliates.

# GUIDING THE PATH TO GREEN

## Sustainability Operating Committee



Transwestern provides clients with market leading energy due diligence and comprehensive reporting.

As part of our participation in the ENERGY STAR program, we created a Sustainability Operating Committee. The Committee in conjunction with company leadership across the country, establishes the firm's overall sustainability plan that includes both an internal corporate plan and an external portfolio program.

- Reduced energy use by 20%
- Decreased portfolio carbon emissions by 8.24 million pounds
- Increased value of client assets by at least \$560 million
- Over \$68 million in efficiency upgrades; estimated ROI's exceeding 40%

**GREEN FACT:** Every passenger mile we fly emits 0.64 pounds of carbon dioxide. What's your total contribution to carbon emissions? Flight Miles per Year \_\_\_\_ (x 0.64) = Year Total

# GUIDING THE PATH TO GREEN

## Putting it in Practice

Engineering and operating teams in Transwestern properties find that their focus on energy efficiency - supported by our corporate culture results in a 15 to 25% reduction in energy consumption, largely through strategies that preclude any capital investments.



**LEADERSHIP & OVERSIGHT**  
Sustainability Team (L to R):  
Tom Boeck, Dennis Thurman, Al Skodowski,  
Roy Cook, Greg O'Brien

- Green “Help Desk” for clients and team members
- Plan to have 42 LEED accredited professionals within the next year
- Met BOMA’s 7-Point Green Challenge before deadline
- First to have policies and procedures outlining new LEED for Existing Buildings: O&M guidelines
- Marketing “green” to tenants: materials and training

**GREEN FACT:** By recycling paper, offices can reduce by 50% the waste we send to landfills – that is 33 million tons of waste diverted – enough to save 561 million trees annually.

# GUIDING THE PATH TO GREEN



**READY...SET...GREEN:** Tenant-focused sustainability program offered nationwide at Transwestern managed properties

**GREEN FACT:** ENERGY STAR labeled air conditioning units use 20-40% less energy than standard systems. If all new homes were installed with ENERGY STAR units, we could save \$100 million annually.

## Practicing ENERGY STAR Policies

### Our Culture of Sustainability

- Partnering with Sylvania on tenant focused program to provide energy efficient bulbs for the home
- Earth Day campaigns nationwide
- Corporate travel offset program
- Utilize hybrid rental cars
- Overnight stays in ENERGY STAR rated hotels
- Recycling programs
- LEED-CI certification obtained for Transwestern offices

# GUIDING THE PATH TO GREEN



Transwestern was one of only two companies selected by ENERGY STAR to be featured in a public service announcement. The PSA will run throughout 2008 in such magazines as National Geographic, Money and National Real Estate Investor.

**GREEN FACT:** Every 10 aluminum cans recycled saves 4 pounds of carbon. Every 10 glass bottles recycled saves 3 pounds of carbon. Recycling newspapers can save 50 pounds of carbon a year.

## Sharing of Data & Industry Focus

*Transwestern recognizes that the commercial industry as a whole is in a unique position to both impact and benefit from promoting energy efficiencies and green building, since the energy used in commercial buildings accounts for approximately 18% of all U. S. greenhouse gas emissions.*

- New councils, forums, industry education, articles
- Sustainable new developments
- Increase focus on tenant related green education
- Client portfolio LEED certification programs
- New updates, articles, tips & tools on [www.transwestern.net/green](http://www.transwestern.net/green)



## GUIDING THE PATH TO GREEN

### Assess Performance & Ensure Quality Management Procedures

Transwestern's benchmarking process is a comprehensive audit of all past, current and future energy usage. Upon completing each property's energy use, recommendations for upgrades are prepared for property owners. This includes the identification of areas for potential cost reductions as well as the potential for improved asset values and returns on investment.

#### Transwestern's building benchmarking and data-gathering processes include:

- Identification of property areas for energy upgrades;
- Preparation of an annual energy audit and utility usage report;
- Preparation of a detailed monthly engineering report; and,
- Opportunities to improve the efficiency and control of HVAC, lighting, plug-load and hours of operation/operator decision.

## Other Services Provided by In-House Experts

Sustainability experts provide consulting services for LEED for Existing Buildings: O&M, LEED-NC, LEED-CS and LEED-CI. We simplify the process and maximize the value of an asset by providing:

- Facility and portfolio audits
- Budget and program development
- Implementation of all commercial LEED programs
- Commissioning to verify the major building components operate as designed and intended
- Ongoing LEED documentation



## GUIDING THE PATH TO GREEN

### About Transwestern

- Full service real estate and development firm
- Wide range of services for office, industrial, retail, healthcare, multifamily
- 24 offices, 1500 team members strong
- In 2007, worked on behalf of, or represented over 1200 institutional, corporate or investment services clients
- Centralized approach to investment and development ensures consistent standards from coast-to-coast





## GUIDING THE PATH TO GREEN

Additional tools to help guide  
your path to green...

**ENERGY STAR**

<http://www.energystar.gov/>

**U.S. GREEN BUILDING COUNCIL**

<http://www.usgbc.org/>

**RECYCLING & WASTE MANAGEMENT**

<http://www.answers.com/topic/scrap-and-waste-materials>

<http://www.informinc.org/wasteatwork.php>

**GREENER FACILITIES**

<http://www.greenerfacilities.org/index.cfm>

<http://www.eco-advantage.com/>

<http://www.transwestern.net/green>

**US EPA & ENERGY STAR  
Energy Management Networking WEB Conference**



*Motivating & Driving Facility Energy Performance*

**Bhaskar Dusi**  
**Corporate Energy Manager**  
**CEMEX US Operations**

**July 23, 2008**



## CEMEX Company Profile : Global

- **Founded in Mexico in 1906 as a local player and grown to become one of the top global companies**
- **Operations in more than 50 countries across five continents**
- **Annual production capacity of**
  - **> 96 MM mt of cement**
  - **> 80 MMcubic meters of ready-mix concrete**
  - **> 222 MM mt of aggregates**
- **Operates**
  - **67 wholly owned cement plants**
  - **Participation in 18 other cement plants**
  - **> 2,360 ready mix concrete facilities**
  - **564 aggregate quarries**
  - **274 land based distribution centers**
  - **97 marine terminals**
  - **67,000 employees worldwide**



Note : Data as of 31 December 2007



## CEMEX Company Profile : U S A

- **One of the top building materials producers in US**
- **Produces Cement, Aggregates, Ready-mix concrete and concrete products**
- **Successfully completed 3 acquisitions and integrations – Southdown in 2000, RMC in 2005 and Rinker in 2007**
- **Has operations in 35 states**
- **14 cement manufacturing facilities**
- **370 ready-mix concrete plants**
- **> 115 aggregate quarries**
- **Approx. 30 fly ash, 60 block and 50 concrete pipe plants**



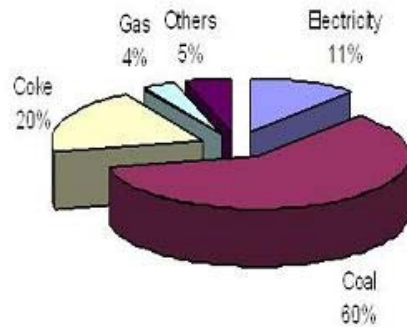
## Involvement with ENERGY STAR, DOE & Other organizations

- Energy Star partner since 2004
- Participated in DOE Save Energy Now program
  - 6 assessments completed as of date
- 3 cement plants received ENERGY STAR awards in 2007
- Member of two major initiatives under World Business Council – Cement Sustainability Initiative (CSI) and Energy Efficiency in Buildings (EEB)
- Active member of PCA
- Number of plants won various Environmental and other Awards/recognitions
- Member of Energy Star study on “**Energy Strategy for the Road Ahead**” done by Global Business Network
- Participates in State utilities programs in different states

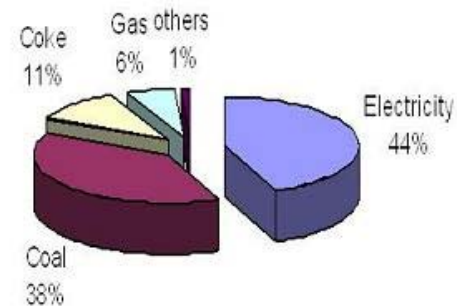


# CEMEX US Energy Consumption (Jan-Dec 2007) For Cement plants

Total CEMEX US Energy Consumption ,



Total CEMEX US Energy Expenditure ,



- **Electricity 11% by consumption, but 44% by cost**



ENERGY STAR  
PARTNER



## CEMEX US Energy Management activities

- **Global Energy division to share best practices/global initiatives**
- **Power & Fuel management through separate divisions**
- **Individual power meters in the plant are linked to a common plant information system and then linked to global network**
- **All plants have Plantwide Information Management System (PIMS) for live monitoring of plant performance**
- **All plants linked through a common network for easy monitoring of key performance metrics (KPIs)**
- **Plants monitored by daily/weekly/monthly/annual basis through budgets, allocations etc.,**
- **All plants are rated for their performance on KPI basis**
- **Incentives/bonus/awards for best achievers**



## CEMEX Energy & KPI's Monitoring Tools

- **Individual Plant performance – PIMS**
- **All Plants together – Grafooper**
- **Fuel Management System**
- **Power Management System**
- **Alternative Fuel Management System**
- **Sustainability metrics monitoring system**






# CEMEX Plant Performance Monitoring Tool

Home SCR USA - Microsoft Internet Explorer


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Back Forward Stop Home Search Favorites Refresh Mail Print Word PDF Help

Address <http://mxdtcnet01/processNet/maps/Home%20SCR%20USA.html> Go



## UNITED STATES



IT View

### PIMS

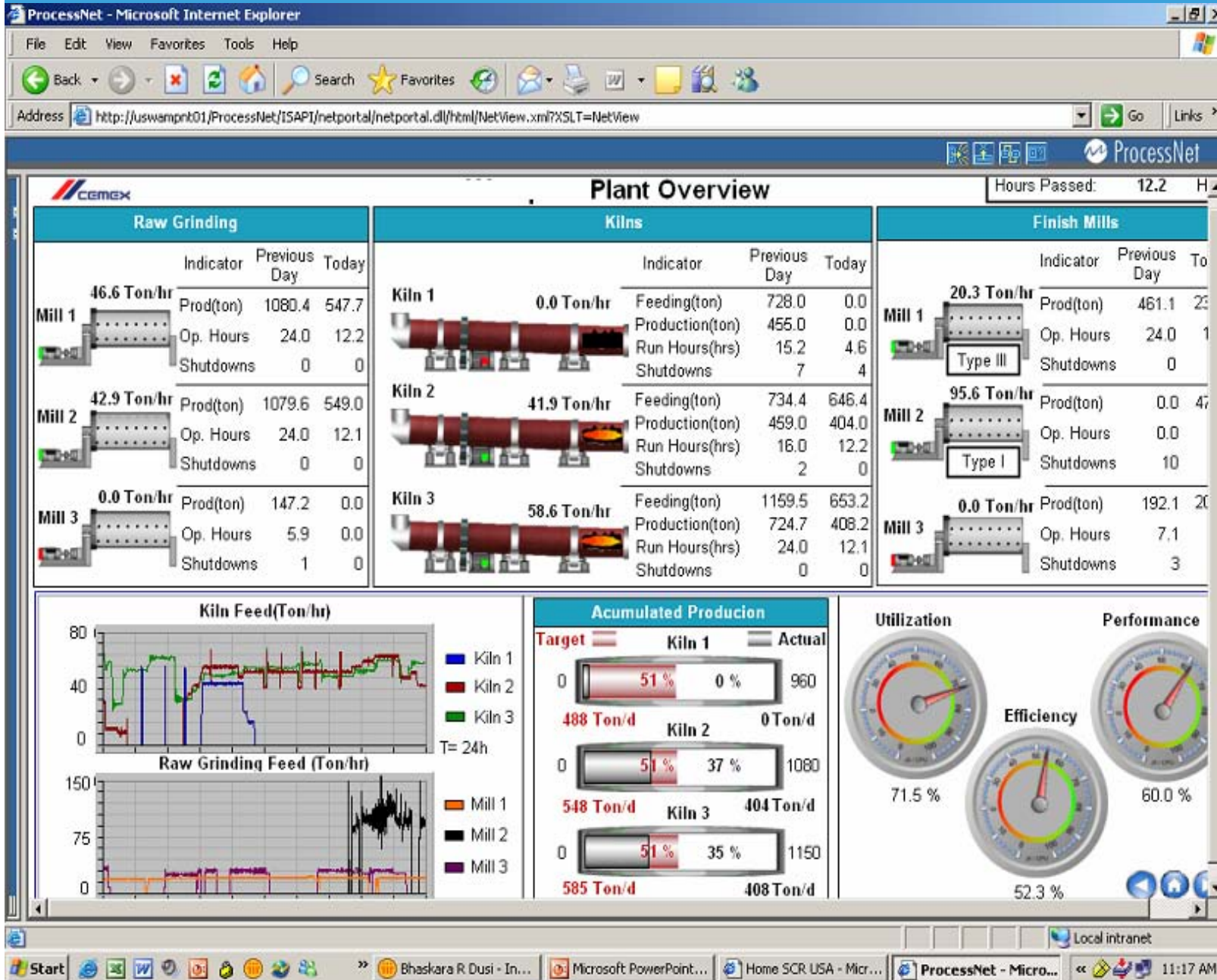
PLANTWIDE INFORMATION MANAGEMENT SYSTEM

Done Local intranet

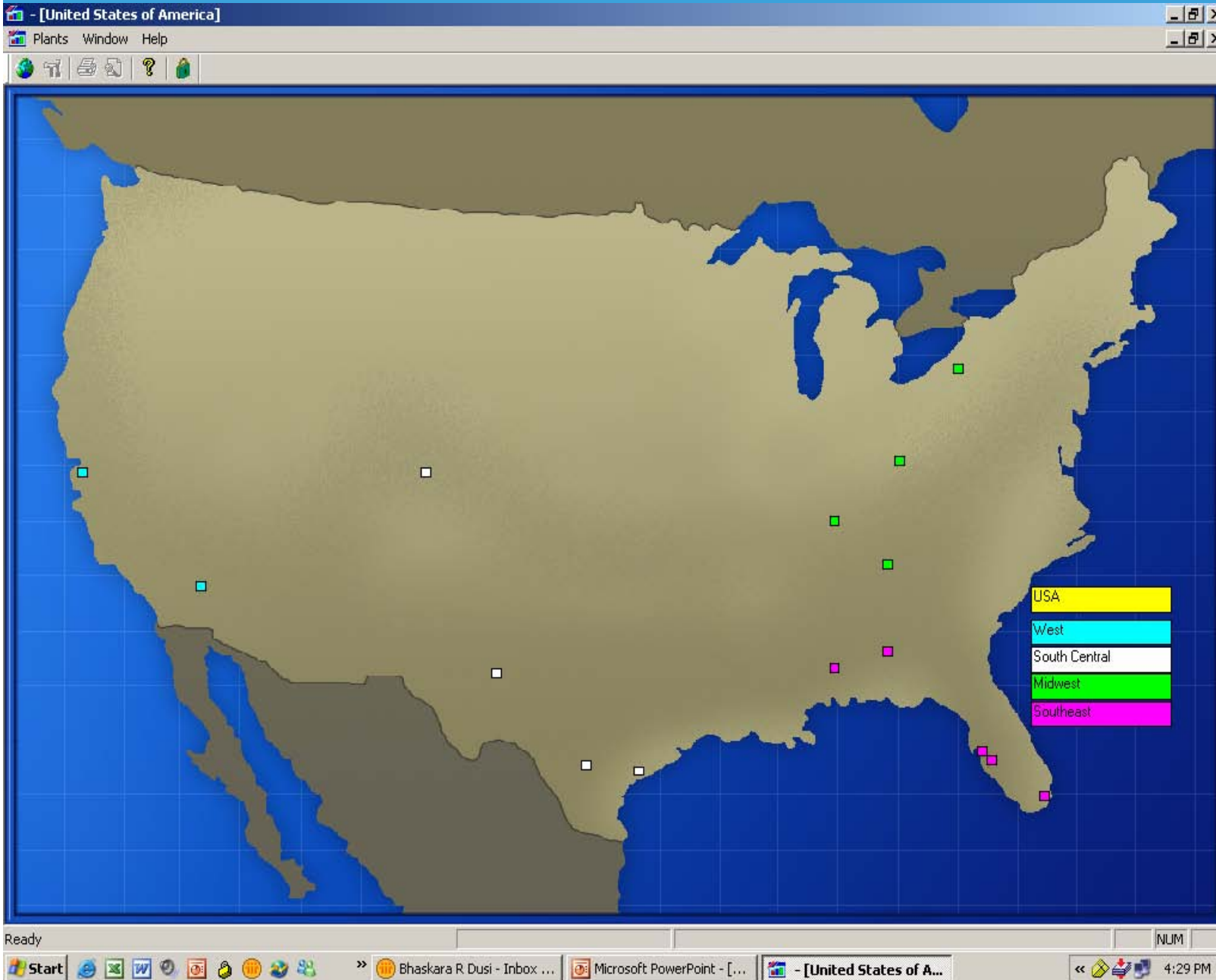
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# CEMEX Plant Performance Monitoring Tool



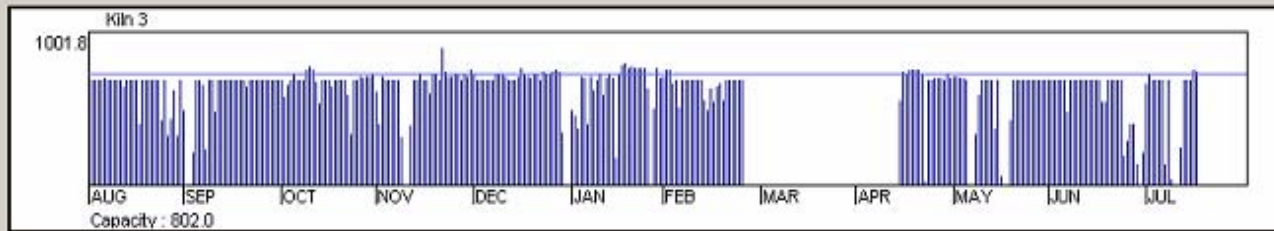
# CEMEX All Plants Performance Monitoring Tool



# CEMEX All Plants Performance Monitoring Tool

- [United States of America-Energy Consumption Statistical Report]

Plants Summary Equipment Materials Statistical Rep. Tools Window Help



Clinker

|                           | AUG      | SEP      | OCT      | NOV      | DEC      | Acc. 2007 | JAN      | FEB      | MAR  | APR      | MAY      | JUN      | JUL      | Mth. Obj. | Acc. 2008 |
|---------------------------|----------|----------|----------|----------|----------|-----------|----------|----------|------|----------|----------|----------|----------|-----------|-----------|
| Kiln 3                    |          |          |          |          |          |           |          |          |      |          |          |          |          |           |           |
| Production                | 20.81    | 20.74    | 22.72    | 21.24    | 22.24    | 245.05    | 22.12    | 16.48    | 0.00 | 13.37    | 18.76    | 18.71    | 9.00     | 23.03     | 98.45     |
| Tons / Day                | 776.14   | 748.67   | 775.72   | 791.13   | 800.36   | 769.79    | 791.60   | 732.28   | 0.00 | 748.12   | 765.21   | 700.99   | 744.19   | 1,904.42  | 747.91    |
| % Total Efficiency        | 83.71    | 86.20    | 91.37    | 88.26    | 89.44    | 83.71     | 88.96    | 70.87    | 0.00 | 55.58    | 75.47    | 77.77    | 70.14    | 0.00      | 62.00     |
| % Operational Efficiency  | 83.71    | 86.20    | 91.37    | 88.26    | 89.44    | 83.71     | 88.96    | 90.18    | 0.00 | 55.58    | 75.47    | 77.77    | 70.14    | 0.00      | 76.34     |
| % Total Utilization       | 86.50    | 92.34    | 94.46    | 89.47    | 89.62    | 87.22     | 90.13    | 77.62    | 0.00 | 59.58    | 79.10    | 88.98    | 75.59    | 39.01     | 66.48     |
| % Operational Utilization | 86.50    | 92.34    | 94.46    | 89.47    | 89.62    | 87.22     | 90.13    | 98.77    | 0.00 | 59.58    | 79.10    | 88.98    | 75.59    | 39.01     | 81.87     |
| % Performance             | 96.78    | 93.35    | 96.72    | 98.64    | 99.80    | 95.98     | 98.70    | 91.31    | 0.00 | 93.28    | 95.41    | 87.40    | 92.79    | 0.00      | 93.26     |
| KWH / Ton Clk.            | 46.87    | 47.98    | 42.98    | 50.14    | 45.03    | 46.06     | 47.74    | 54.40    | 0.00 | 46.52    | 48.80    | 49.30    | 53.06    | 0.00      | 49.67     |
| kcal / kg CLK             | 1,112.50 | 1,170.09 | 1,225.50 | 1,172.20 | 1,165.49 | 1,092.22  | 1,102.22 | 1,018.67 | 0.00 | 1,315.23 | 1,285.80 | 1,206.86 | 1,168.14 | 0.00      | 1,178.07  |
| Stoppages Number          | 18       | 6        | 8        | 4        | 4        | 66        | 10       | 5        |      |          | 4        | 4        | 3        |           | 26        |

Ready Energy Consumption Statistical Report - NJM

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# CEMEX Fuel Management System

http://energia.cemex.com/fms/content/home/HomeApp.asp - Microsoft Internet Explorer

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Address http://energia.cemex.com/fms/content/home/HomeApp.asp Go

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



**CEMEX NEWS** | **WE ARE CEMEX** | **PEOPLE** | **COMMUNITIES** | **SERVICES** | **MY PLAZA**

## Fuel Management System v2

**Current Status of Coal and Petcoke Shipments** [Browse FMS](#)

**Instructions:** You can view the country fuel structure by moving the pointer over its icon and the global fuel structure over the CEMEX icon, in addition if you like to see the country inventory detail click on the country. Also you can see the shipment information by moving the pointer over the appropriate vessel icon.



 = Shipment waiting  = Shipment discharged  = Shipment in route  = Shipment nominated  = Shipment on demurrage  = CEMEX country

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# CEMEX Power Management System

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**Community of Planning and Control of Energy** Search:  Go [Advanced search](#)

You are here: Home > Communities > Community of Planning and Control of Energy

**Electricity Overview - Click a flag to show country details**

| Country        | Generation (kW) |
|----------------|-----------------|
| USA            | 138,891 kW      |
| Mexico         | 283,887 kW      |
| TEG Generation | 241,680 kW      |
| Colombia       | 15,442 kW       |
| Venezuela      | 38,919 kW       |
| Peru           | 10,675 kW       |
| Chile          | 15,644 kW       |
| Costa Rica     | 3,205 kW        |
| Indonesia      | 11,243 kW       |
| Philippines    | 906 kW          |
| India          | 68,245 kW       |
| Spain          | 31,478 kW       |
| Italy          | - kW            |
| UK             | - kW            |
| Germany        | 64,204 kW       |
| Poland         | 16,852 kW       |
| Czech Republic | 2,320 kW        |
| Slovakia       | 32,891 kW       |
| Austria        | 8,878 kW        |
| Netherlands    | 19,488 kW       |
| Belgium        | 9,141 kW        |

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>> Please send your opinions and comments about this site: [here](#)



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# CEMEX Alternative Fuel Management System

AFMS - Microsoft Internet Explorer

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Address <http://energia.cemex.com/afms/content/index.asp?Modulo=1008Padre=0> Go

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Cemex News We are Cemex People Communities Services My Plaza

Alternative Fuel Management System About this Map How to Browse Browse AFMS: Home Go

Daily Indicators Last Update 07/14/2008

● % ≥ 95 ● 90 ≤ % < 95 ● % < 90 ● w/o Budget

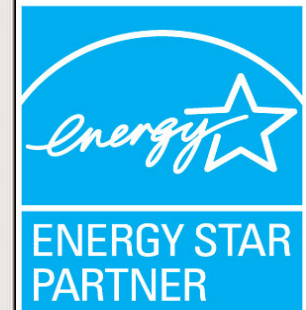
Welcome to the new version of AFMS!

Consolidated data with 1 day of delay

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## CEMEX US Energy Management activities

- We have excellent tools as mentioned in the previous slides
- But we observed that tools alone will not be able to give the expected results in Energy Performance
- Existence of a structured approach to Energy Management is required in order to ensure long term results for the facilities
- We selected a Program based on **ENERGY STAR “ Guidelines for Energy Management”**

**These guidelines have helped us in :**

- **Organizing our Energy teams**
- **Starting our Energy Program**
- **Building capacity**
- **Sustaining the team, and**
- **Maintaining momentum**





## CEMEX US Energy Management activities

**Worked with EPA ENERGY STAR Account Manager Fred Schoeneborn to develop a strategy to engage plants and management**

**I presented the strategy at various levels in our organization to involve and take support from every one –**

- **Within the department**
- **With all plant managers**
- **With Vice Presidents ( Manufacturing ) and Executive Vice Presidents**
- **With President**



## **CEMEX US Energy Policy**

**We prepared Energy Policy and announced the program through our President**

### **CEMEX Energy Policy**

**CEMEX is committed to the efficient, cost-effective, and environmentally responsible use of energy and continually strives to lower carbon foot print by conducting its operations in a sustainable manner throughout the US. CEMEX will promote energy efficiency by implementing programs that optimize service reliability, improve product & service quality, increase productivity, enhance the safety of our workplace and contribute to sustainable operations.**



# Top Executive Energy Management Team

| CEMEX USA : CORPORATE ENERGY MANAGEMENT STRUCTURE |                |  |
|---|----------------|--|
| Position  | Current Person | Responsibilities   |
| Executive VP (Technical)                          | Adolfo Garza   | Coordinator of international energy program & Overall incharge for US    |
| Director (PT&E)                                   | Kevin Kelley   | Champion of energy program to executives, Incharge for US energy program |
| Energy Manager (EM)                               | Bhaskar Dusi   | Daily Management of the CEMEX USA Energy Program                         |



# Corporate & Site Energy Management Team

| CEMEX ENERGY MANAGEMENT PROGRAM: CORPORATE TEAM DETAILS |      |   |
|---|------|---|
| Department  | Name | Responsibility  |
| Corporate Energy Leader (Cement)                        |      | Consolidate all information from Site Energy Leader (SEL) at each cement plant                            |
| Team Members  |      |   |
| Fuels   |      | Develop Energy contracts  |
| Power   |      | Develop Energy contracts  |
| Procurement   |      | Procurement of EE equipment, services and alternative fuels   |
| Operations Support                                      |      | Provide energy performance data to Cement Energy Leader and Cement SEL                                    |
| Planning  |      | Help request funding for Energy projects  |
| Environmental   |      | Technical assistance in environment & energy related projects   |
| Process   |      | Provide technical assistance in defining and reviewing EE processes                                       |
| Projects  |      | Coordinate the study and engineering of EE projects, assure an energy audit is conducted for all projects |

| CEMEX ENERGY MANAGEMENT PROGRAM: VICTORVILLE TEAM DETAILS |      |           |        |        |
|---|------|-----------|--------|--------|
| Department  | Name | Phone Nos |        | E-mail |
|   |      | Office    | Mobile |        |
| Site Energy Leader  |      |           |        |        |
| Team Members  |      |           |        |        |
| Process   |      |           |        |        |
| Mechanical  |      |           |        |        |
| Electrical  |      |           |        |        |
| Instrumentation   |      |           |        |        |
| Procurement   |      |           |        |        |



# Implementation Plan

| S. No. | Activity   | Scheduled completion |     |     |     |     |     |     |     |     |     |   |   |
|--------|--|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|---|
|        |  | Mar                  | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |   |   |
| 1      | Release of EMP announcement & Corporate Energy Policy  | █                    |     |     |     |     |     |     |     |     |     |   |   |
| 2      | Publication of Program information in VOICE & US weekly news letter  |                      | █   |     |     |     |     |     |     |     |     |   |   |
| 3      | Incorporation of Energy Topic separately in Plant Managers meeting and other Top Management Corporate Review meetings and recording of the minutes |                      | █   |     |     |     |     |     |     |     |     |   |   |
| 4      | Finalization of Corporate and Site Energy teams  | █                    | █   |     |     |     |     |     |     |     |     |   |   |
| 5      | Plant visits by Bhaskar Dusi and Rick Haverland to initiate the program  |                      | █   | █   | █   |     |     |     |     |     |     |   |   |
| 6      | Finalization of Energy Score Card  |                      | █   | █   | █   | █   |     |     |     |     |     |   |   |
| 7      | Conducting energy awareness campaign among all the employees at Corporate and Plants   |                      | █   | █   | █   | █   | █   | █   | █   | █   | █   | █ | █ |
| 8      | Setting goals for each plant as achievable and agreeable by the plant energy teams   |                      | █   | █   | █   |     |     |     |     |     |     |   |   |
| 9      | Conducting Energy audits in plants through Process Optimization group and external consultants   |                      |     |     | █   | █   | █   | █   | █   | █   | █   | █ | █ |
| 10     | Monitoring and tracking of the results by comparing with bench marking and through Score Card  |                      |     |     |     | █   | █   | █   | █   | █   | █   | █ | █ |
| 11     | Sharing Best Practices among the plants and also with the Energy Star partners   |                      |     | █   | █   | █   | █   | █   | █   | █   | █   | █ | █ |



# Energy Management Program Announcement

SUSTAINABILITY

## Making A Commitment To Energy Efficiency CEMEX to Implement Energy Management Program Under ENERGY STAR Guidelines

CEMEX is committed to the efficient, cost-effective and environmentally responsible use of energy, and continually strives to reduce its carbon footprint by conducting its operations in a sustainable manner throughout the U.S. CEMEX will promote energy efficiency by implementing programs that optimize service reliability, improve product and service quality, increase productivity, enhance the safety of its workplace and contribute to sustainable operations.



A new Energy Management Program announced in March signals a renewed commitment to excellence in the company's operations. The program will place increased emphasis on the goal of maximizing energy efficiency, reducing the company's carbon footprint and reducing costs. As industry leaders, the people of CEMEX have a unique opportunity to participate in a program that will set new standards for corporate social responsibility and sustainable development.

"This program is designed to optimize our efforts using the ENERGY STAR program guidelines established by the U.S. EPA and U.S. Department of Energy," said one President of CEMEX USA **Giuseppe Pavesi**, in a memo released on March 28th. "ENERGY STAR offers a proven energy strategy that helps in lowering current energy performance, benchmarking, setting goals, tracking, setting and rewarding improvements."

Since CEMEX often has to do several renovations and energy related projects, any improvements in conservation and energy efficiency will have a beneficial effect on reducing Greenhouse Gas (GHG) emissions.

"We cannot achieve our goal of spreading our operations and improving performance and productivity without

concentrating on our energy usage," said Pavesi. "To this end, a new corporate energy policy has been adopted to support the will of the executive leadership and the board of directors in charting a new course toward achieving energy efficient operations across all company lines."

A Corporate Energy Management Team has been appointed to oversee the program in all CEMEX facilities. **Shankar Das** will oversee the program. **Kevin Kelley** has responsibility for the company's initial energy initiatives and will oversee the program. However, the main energy conservation initiative falls under the direction of **Rick Handford**. Initially, the program will focus on the company's 14 U.S. cement plants before expanding to ready-mix and aggregate operations.

"My job will be to work with the site energy teams to benchmark each site, set goals and track progress," said Das. "Our focus will be to define new methods for using energy wisely and it's important for everyone to get involved and help achieve the desired results."

**Rick Handford** will serve as the corporate energy leader for the cement operations. He will be supported by the corporate energy and site energy teams in developing new projects that define a standard of excellence for energy efficient operations. The focus of the program will be shared with other divisions of the company as it is being implemented.

"The Energy Management Program

represents a promising new avenue for the company—one that has tremendous potential to improve not only our energy efficiency, but also our operating costs and the bottom line," said Das. "It offers a way for all of the people of CEMEX to make an important contribution to improving the environment by reducing our reliance on greenhouse gases."



The above diagram illustrates the main management elements of the ENERGY STAR "Guidelines for Energy Management". To read the Guidelines, visit [www.energystar.gov](http://www.energystar.gov)



## Activities carried out during plant visits

- **Introduction of EMP to site teams**
- **Assess existing energy measurement and documentation**
- **Benchmark energy performance of each cement plant**
- **Establish individual plant Goals**
- **Identify past projects that have energy saving opportunities**
- **Conduct brain storming session to identify energy saving projects**
- **Create an action plan to achieve the goals**
- **Explain requirements from plant site teams**
  - **Conduct periodic meeting and record minutes**
  - **Track energy consumption and performance**
  - **Report results and progress**
  - **Recognize achievements**
  - **Create Energy Awareness**



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# Production & Energy Score card

| Metric  | Max | Score | % |
|---|-----|-------|---|
| <b>Performance</b>  |     |       |   |
| Specific heat consumption [% of budget (kcal/kg clinker)]                       |     |       |   |
| Specific power consumption – plant [% of budget (kW·h/ton cement)]              |     |       |   |
| Yield – kilns [%]   |     |       |   |
| Yield – finish mills [%]  |     |       |   |
| Total usage (uptime) – kilns [%]  |     |       |   |
| Kiln stops (production only) [#]  |     |       |   |
| <b>Cost</b>   |     |       |   |
| Alternative fuel substitution [% of budget]                                     |     |       |   |
| Alternative raw material substitution [% of budget]                             |     |       |   |
| Grinding media consumption [g/Mg cement]  |     |       |   |
| Refractory consumption [g/Mg clinker]   |     |       |   |
| Grinding aid consumption [lb/ton cement]  |     |       |   |
| <b>Processes</b>  |     |       |   |
| Raw mill inspections – on-line (% of applicable)                                |     |       |   |
| Raw mill inspections – off-line (% of applicable)                               |     |       |   |
| Preheater profiles (% of applicable)  |     |       |   |
| Clinker cooler profiles/balances (% of applicable)                              |     |       |   |
| Fuel mill profiles/balances (% of applicable)                                   |     |       |   |
| Cement mill inspections – on-line (% of applicable)                             |     |       |   |
| Cement mill inspections – off-line (% of applicable)                            |     |       |   |
| <b>Energy Management</b>  |     |       |   |
| Number of energy team meetings held [#]   |     |       |   |
| Energy savings opportunities identified [% of target]                           |     |       |   |
| Number of measures implemented [% of target]                                    |     |       |   |
| Savings achieved with the measures - fuel [% of previous year kcal/kg clinker]  |     |       |   |
| Savings achieved with the measures - power [% of previous year kW·h/ton cement] |     |       |   |
| Number of promotions to improve energy efficiency [#]                           |     |       |   |
| Number and type of recognitions [#]   |     |       |   |





## Problems encountered during initial phase

- **All plants are different & have different opportunities that need different approaches**
- **Feed back from plants that filled out the US EPA facility assessment matrix model was confusing, and difficult to analyze and summarize**
- **Approach for identifying projects, fixing accountability and Responsibilities and creating action plans was not well organized**
- **Initial site visit was inefficient and time consuming**



# Site Energy Management Plan : Template

To take care of all the above problems we developed a SEMP template incorporating:

- All components of EPA ENERGY STAR Corporate and Facility assessment matrices
- Organizational Energy Policy, Management chart
- Sustainability initiative details
- Corporate and site team details
- Listing of all studies done at the plant
- List of all measures identified for the plant for energy savings
- Selection of 5 short term and 5 long term measures for attention
- Creating action plan and responsibility/ownership for these measures



# Site Energy Management Plan : Template

| S.No  | Description                                       | Page No. |
|-------|---|----------|
| 1.0   | <b>COMMITTING TO ENERGY MANAGEMENT</b>            | 1        |
| 1.1   | Energy Policy                                     | 1        |
| 1.2   | Corporate Energy Management Structure             | 2        |
| 1.3   | Corporate Energy Manager                          | 3        |
| 1.4   | Corporate Energy Team                             | 4        |
| 1.5   | Site Energy Team                                  | 5        |
| 1.6   | Energy Planning and Accountability                | 6        |
| 1.6.1 | CEMEX Global                                      | 6        |
| 1.6.2 | CEMEX US Cement Operation                         | 6        |
| 1.6.3 | CEMEX Davenport Cement Plant                      | 8        |
| 1.7   | Energy Management Participation                   | 8        |
| 2.0   | <b>MEASURING AND DOCUMENTING ENERGY USE</b>       | 9        |
| 2.1   | Power   | 9        |
| 2.2   | Fuel  | 10       |
| 3.0   | <b>REVIEWING HISTORY, BUDGET AND BENCHMARKING</b> | 11       |
| 3.1   | Power   | 11       |
| 3.2   | Fuel  | 12       |
| 3.3   | Alternative Fuels                                 | 12       |



# Site Energy Management Plan : Template



| S.No  | Description                   | Page No. |
|-------|-------------------------------|----------|
| 4.0   | <b>SETTING ENERGY GOALS</b>   | 13       |
| 4.1   | Power                         | 13       |
| 4.2   | Fuel                          | 13       |
| 4.3   | Alternative Fuels             | 13       |
| 5.0   | <b>DEFINING OPPORTUNITIES</b> | 14       |
| 5.1   | Previous Assessments          | 14       |
| 5.2   | List of Opportunities         | 14       |
| 5.2.1 | Power efficiency              | 14       |
| 5.2.2 | Fuel efficiency               | 15       |
| 5.2.3 | Alternative fuels utilization | 15       |
| 5.2.4 | General                       | 15       |

# Awareness and Recognition

**The employee awareness and recognition components are taken at two levels:**

- 1. At Corporate level**
- 2. At Plant Level**



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## Questions & Answers

**Additional Questions ?? You may contact me directly :**

*Bhaskar Dusi, P. Eng.,  
Corporate Technical Energy Manager  
CEMEX US Operations  
840, Gessner Rd., Suite 1400, Houston, TX 77024  
Office : 713-722-2961; Mobile : 832-472-3123 ;  
Fax : 281-715-4474  
E-Mail : [bhaskar.dusi @ cemex.com](mailto:bhaskar.dusi@cemex.com)*





# Questions & Discussion

# 2008 Web Conferences



| Month     | Topic                                       |
|-----------|---|
| July      | Motivating and driving facility performance |
| August    | “Cool” Energy Savings Strategies            |
| September | Supply Chain Energy & Climate Initiatives   |
| October   | Energy & Climate Risk Management            |
| November  | Energy Strategy & Project Financing         |

Past Presentations – See “Networking Opportunities” @ [energystar.gov](http://energystar.gov)





Thank You!