Energy and GHG Management

ENERGY STAR Monthly Partner Web Conference

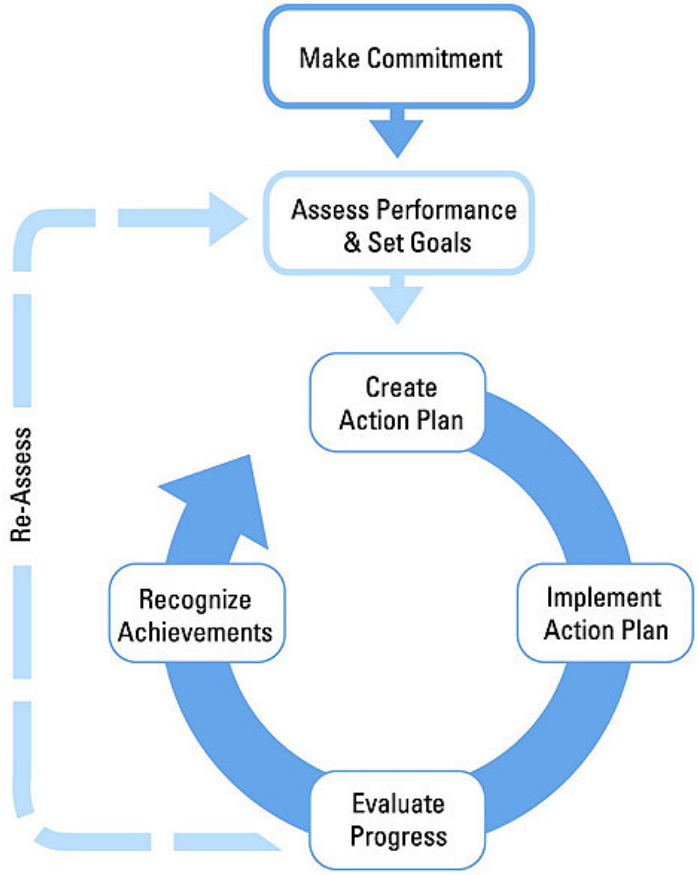
October 18, 2006

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**
- **Supports the ENERGY STAR Challenge to build a better world, 10% at time**



Web Conference Tips

- Mute phone when listening! Improves sound quality for everyone.

  Use * 6 – to mute and # 6 to un-mute

- Hold & Music – If your phone system has music-on-hold, please don't put the web conference on hold!

- Presentation slides will be sent by email to all participants following the web conference.

Today's Web Conference

- **Background** – Jim Sullivan, US EPA Climate Leaders Prg.
- **Raytheon -** Nancy Kitsos & David Chamberlain
- **California Portland Cement Co**. **-** Rick Jacobs

CLIMATE LEADERS

U.S. Environmental Protection Agency

Energy and Greenhouse Gas Management

ENERGYSTAR Web Conference 10/18/06

Climate Change is Important Strategic Issue for Companies

- Climate Leaders works with companies to develop long-term comprehensive GHG management strategy
- Effective corporate climate strategy, road-tested with >100 partners from every major sector
- 3 critical components to credible strategy
  - Complete Corporate-Wide GHG Inventory
  - Develop Inventory Management Plan (IMP)
  - Set Corporate-Wide GHG Reduction Goal
- Public reporting important consideration as well

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U.S. Environmental Protection Agency

A Customized Inventory –
Based on International WRI/WBCSD GHG Protocol

- Required
  - Corporate-wide (all U.S. operations)
  - 6 major GHGs
  - Direct emissions
  - Indirect emissions from electricity, heat, and steam
- Optional
  - International operations
  - Offset projects
  - Employee travel and commuting
  - Product transport

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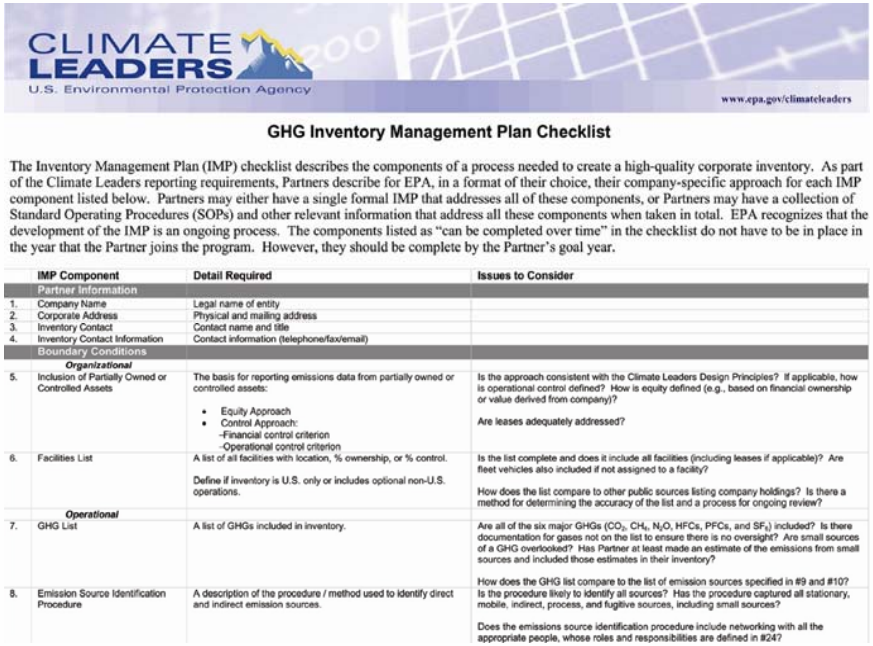
Inventory Management Plan –
Institutionalizes Process

- Partners develop and implement an IMP or a similar collection of Standard Operating Procedures and document process for EPA
- EPA provides checklist of components for good IMP to use as guideline when preparing documentation
- EPA offers technical assistance to help companies complete IMP documentation



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www.epa.gov/climateleaders

GHG Inventory Management Plan Checklist

The Inventory Management Plan (IMP) checklist describes the components of a process needed to create a high-quality corporate inventory. As part of the Climate Leaders reporting requirements, Partners describe for EPA, in a format of their choice, their company-specific approach for each IMP component listed below. Partners may either have a single formal IMP that addresses all of these components, or Partners may have a collection of Standard Operating Procedures (SOPs) and other relevant information that address all these components when taken in total. EPA recognizes that the development of the IMP is an ongoing process. The components listed as "can be completed over time" in the checklist do not have to be in place in the year that the Partner joins the program. However, they should be complete by the Partner's goal year.

	IMP Component	Detail Required	Issues to Consider
	Partner Information		
1.	Company Name	Legal name of entity	
2.	Corporate Address	Physical and mailing address	
3.	Inventory Contact	Contact name and title	
4.	Inventory Contact Information	Contact information (telephone/fax/email)	
	Boundary Conditions		
	Organizational		
5.	Inclusion of Partially Owned or Controlled Assets	The basis for reporting emissions data from partially owned or controlled assets: • Equity Approach • Control Approach: –Financial control criterion –Operational control criterion	Is the approach consistent with the Climate Leaders Design Principles? If applicable, how is operational control defined? How is equity defined (e.g., based on financial ownership or value derived from company)? Are leases adequately addressed?
6.	Facilities List	A list of all facilities with location, % ownership, or % control. Define if inventory is U.S. only or includes optional non-U.S. operations.	Is the list complete and does it include all facilities (including leases if applicable)? Are fleet vehicles also included if not assigned to a facility? How does the list compare to other public sources listing company holdings? Is there a method for determining the accuracy of the list and a process for ongoing review?
	Operational		
7.	GHG List	A list of GHGs included in inventory.	Are all of the six major GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) included? Is there documentation for gases not on the list to ensure there is no oversight? Are small sources of a GHG overlooked? Has Partner at least made an estimate of the emissions from small sources and included those estimates in their inventory? How does the GHG list compare to the list of emission sources specified in #9 and #10?
8.	Emission Source Identification Procedure	A description of the procedure / method used to identify direct and indirect emission sources.	Is the procedure likely to identify all sources? Has the procedure captured all stationary, mobile, indirect, process, and fugitive sources, including small sources? Does the emissions source identification procedure include networking with all the appropriate people, whose roles and responsibilities are defined in #24?

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Inventory Management Plan – Internal Benefits

- EPA review of a company's IMP provides assurance that Partners develop a high-quality inventory that is consistently maintained and updated over time
  - Institutionalizes inventory process
  - Leads to comprehensive & credible data management
  - Increases efficiency/lowers costs by centralizing processes
  - Increases accuracy and transparency
  - Facilitates long-term emissions/goal tracking
  - May facilitate documentation of capital savings
  - Allows for continual improvement

"Perhaps the most rewarding effect of this [IMP] process was the development of new procedural improvements that enable us to collect data more accurately and regularly for the future."
-Green Mountain Energy Company
2004 Environmental Report

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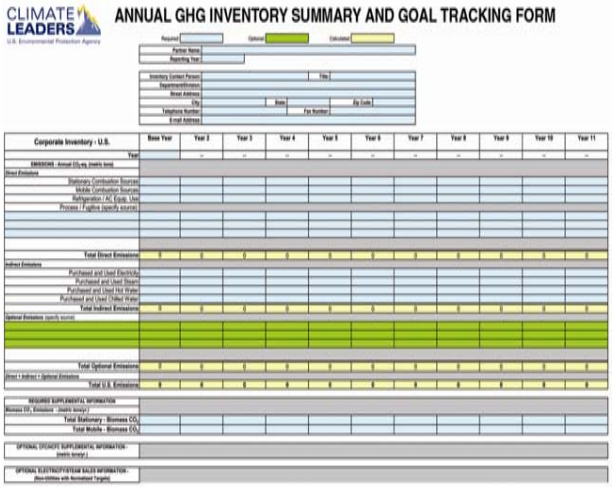
U.S. Environmental Protection Agency

GHG Reduction Commitments –
Goal Setting Drives Action

More than half of Partners have already set reduction goals, others completing inventories before announcing

- SC Johnson pledged to reduce emissions by 23% per lb. product from 2000-2005
- General Motors pledged to reduce total GHG emissions by 10% for all of their N.A. facilities from 2000 to 2005
- Bank of America pledged to reduce total GHG emissions by 9% from 2004-2009
- 3M pledged to reduce total GHG emissions by 30% from 2002 to 2007



5 Partners have met their initial goals
- Baxter, GM, IBM, NREL, SC Johnson

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U.S. Environmental Protection Agency

Ensuring Credibility of Inventory Data and Management Process

- EPA technical assistance for inventory/IMP development and reporting process
- Desktop reviews of corporate level inventory data and how IMP components are addressed
- Onsite review of implementation of IMP
- CL does not offer third-party verification, but meeting reporting requirements will ensure that credible/verifiable inventory process is in place
  - Third-party verification option (must meet same criteria as CL reporting requirements)

"One of the biggest values from joining Climate Leaders was to help us put together an inventory that is robust enough to stand up to scrutiny."
- Al Forte, Assistant Director, Energy, Pfizer, Inc.

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Public Reporting Increasing

- Environment/Sustainability Reporting
  - ~ 70% of Partners have published an environment or sustainability report
- Carbon Disclosure Project
  - 63 Partners received CDP4 questionnaire, 90% CL Partners responded (72% overall response rate)

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Energy Management is Critical Component for GHG Management

- GHG emissions from energy use represent significant portion of corporate inventories (~80%)
- GHG management process helps develop, document and maintain credible data management
- GHG goals can help focus corporate attention on energy efficiency efforts
  - Gain senior management attention and increase funding
  - Institutionalizes tracking process for ee efforts over time
  - Encourage innovation and lead to identification of many additional reduction opportunities
  - Improve employee morale and help in retention/recruiting of qualified employees
  - Help identify new business opportunities

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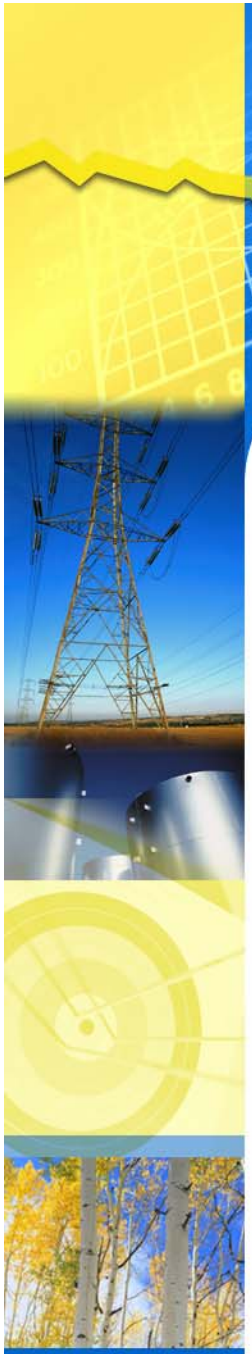
The Company We Keep



Company Presentations

- **Raytheon**
  - Nancy Kitsos, *Senior Manager, Corporate Environmental, Health and Safety*
  - David Chamberlain, *Principal Energy Engineer, Facilities, Integrated Defense Systems*
- **Cal Portland**
  - Rick Jacobs, *Chief Process Engineer*
- **www.epa.gov/climateleaders**

Click on Events for many useful case studies

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U.S. Environmental Protection Agency

Raytheon

Customer Success Is Our Mission

Role of Energy Management in Climate Change

Raytheon Company
October 18, 2006
USEPA Energy Star Web Conference

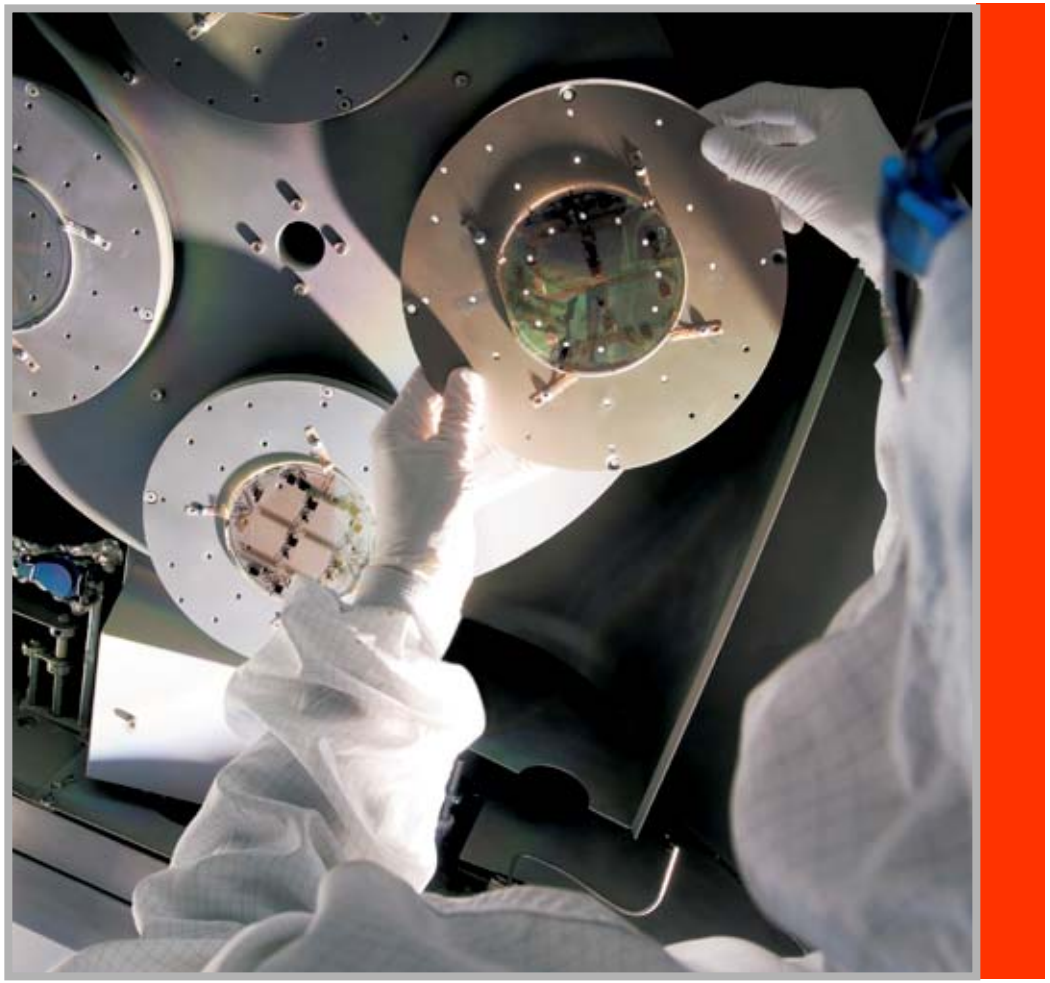
Nancy Kitsos,
Senior Manager, Corporate Environmental, Health and Safety

David Chamberlain,
Principal Energy Engineer, Facilities, Integrated Defense Systems

Raytheon … What We Do

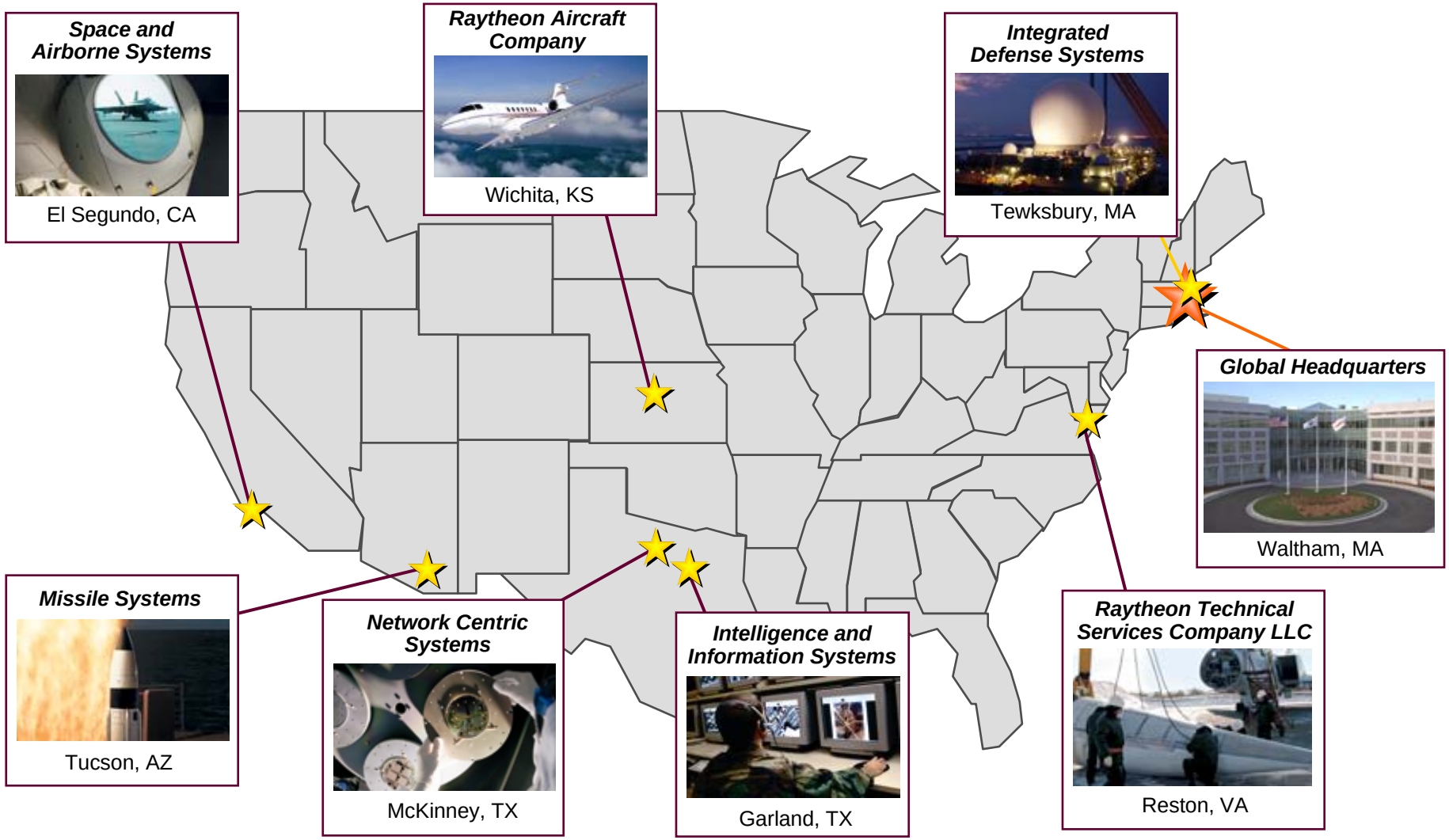
A global leader in technology-driven solutions that provide customers with integrated mission systems

- Raytheon is an industry leader in:
  - Defense and government electronics
  - Space
  - Information technology
  - Technical services
  - Business aviation and special mission aircraft
- Raytheon provides integrated mission systems to meet the critical defense and non-defense needs of its customers



8,000 programs; 13,000 active contracts

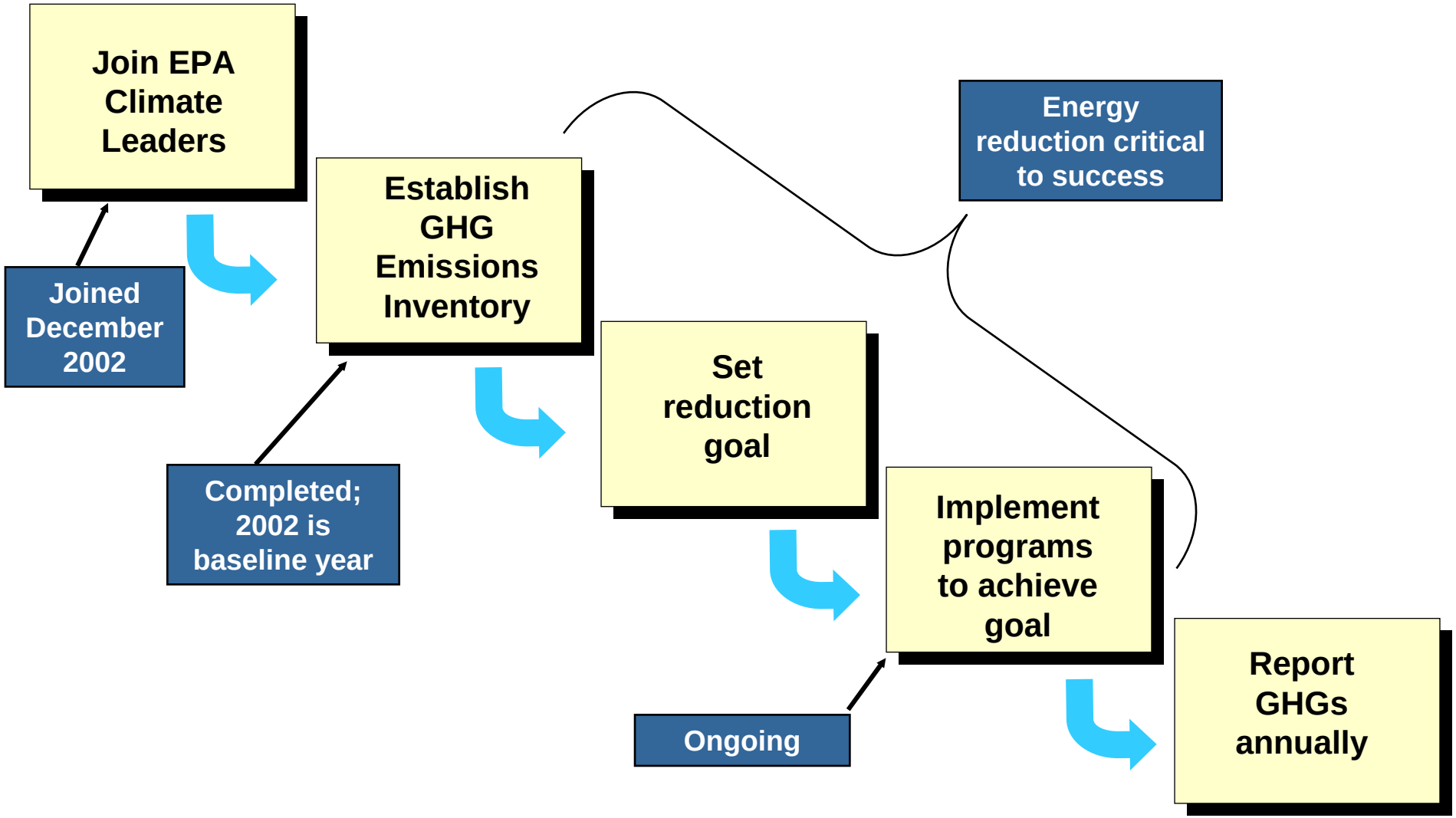
Raytheon Business Headquarters



80,000 employees; 2005 revenue: $21.9B

Raytheon

Climate Leaders Program Steps



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Sources of GHG Emissions

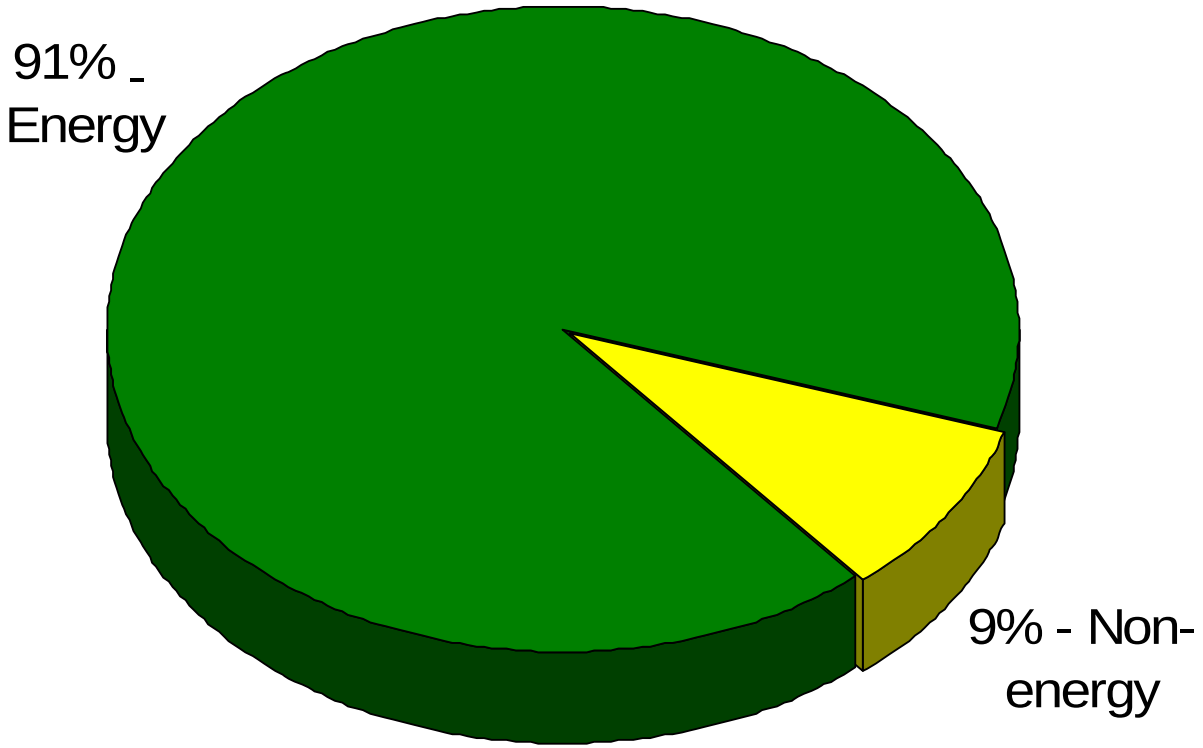
- Indirect Emissions
  - **Electricity purchases**
  - **Hot water and chilled water purchases**
- Direct Emissions
  - **Gas consumption**
  - **Oil consumption**
  - Mobile sources
  - Industrial processes
  - Refrigerants

Six Greenhouse Gases:

- Carbon Dioxide (CO2)
- Methane (CH4)
- Nitrous Oxide (N2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF6)

Energy Sources in Red

Sources of Raytheon's Greenhouse Gas Emissions

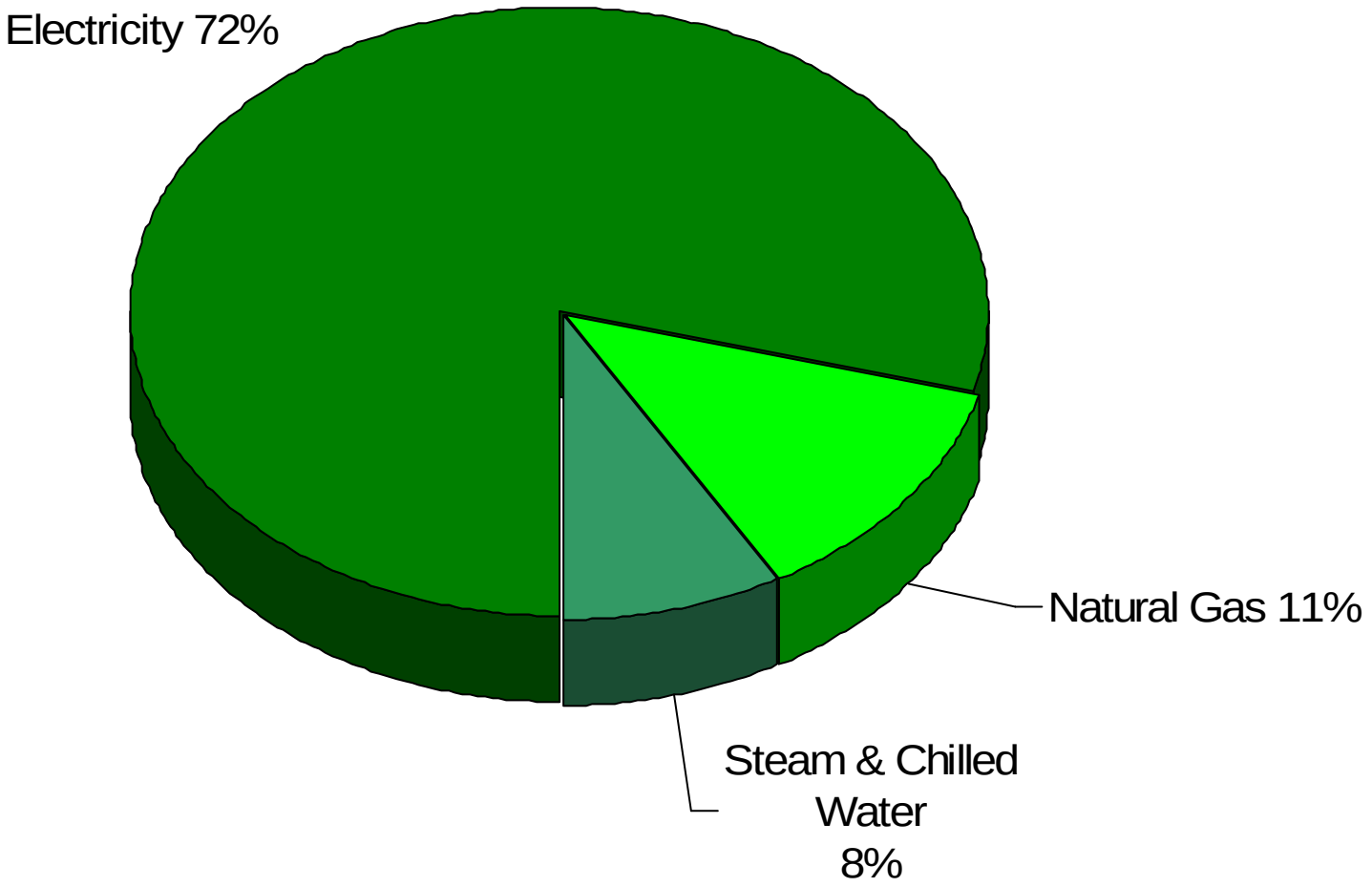


2004 Data

Energy is the majority source of GHG emissions

Raytheon

GHG Emissions From Energy



2004 Data

Most of the Energy Consumption is Electricity

Raytheon

Data Collection Responsibilities

Emission Source	Data collection	Data Source & Process
Energy Consumption (electricity, gas, hot water/ chilled water, oil - Major Sites)	Facilities	Consumption data – Energy Star data. Approx. 45 sites EHS converts to GHG emissions
Energy Consumption from Small Sites (electricity and gas)	EHS & Facilities	Estimated consumption using national factors and sq ft. Used Corp. Real Estate List of properties. Approx. 165 sites
Manufacturing Chemicals	EHS	Purchase records via centralized database..
Company Vehicles	EHS	AMI leasing agreement from Corp. Insurance contains a list of vehicles. Assumed miles/yr and mpg.
Aviation	EHS	CEO jet, D.C. jet, Wichita shuttle. Gallons of jet fuel from purchase records.
Refrigerants (Bldg Cooling)	EHS	Estimated. Assumed 15% of company sq ft is cooled by HFCs. Value is very small.

Strong Partnership Between EHS and Facilities

Raytheon's Greenhouse Gas Goal

33% reduction in GHGs/revenue
over 7 years (2002 – 2009)
adjusted for inflation

- Raytheon's GHG reduction goal approved by U.S. EPA on September 28, 2006
- Goal publicly announced at the Climate Leaders meeting in Washington, D.C. on October 13
- Strategy for meeting goal: energy conservation with active employee participation

How to get employees attention?

Raytheon spends
over $100M a year on energy…..

At a 10% profit margin, it takes over $1B of revenue just to pay the energy bills

Energy Conservation for a Competitive Advantage

YOU HAVE the POWER®

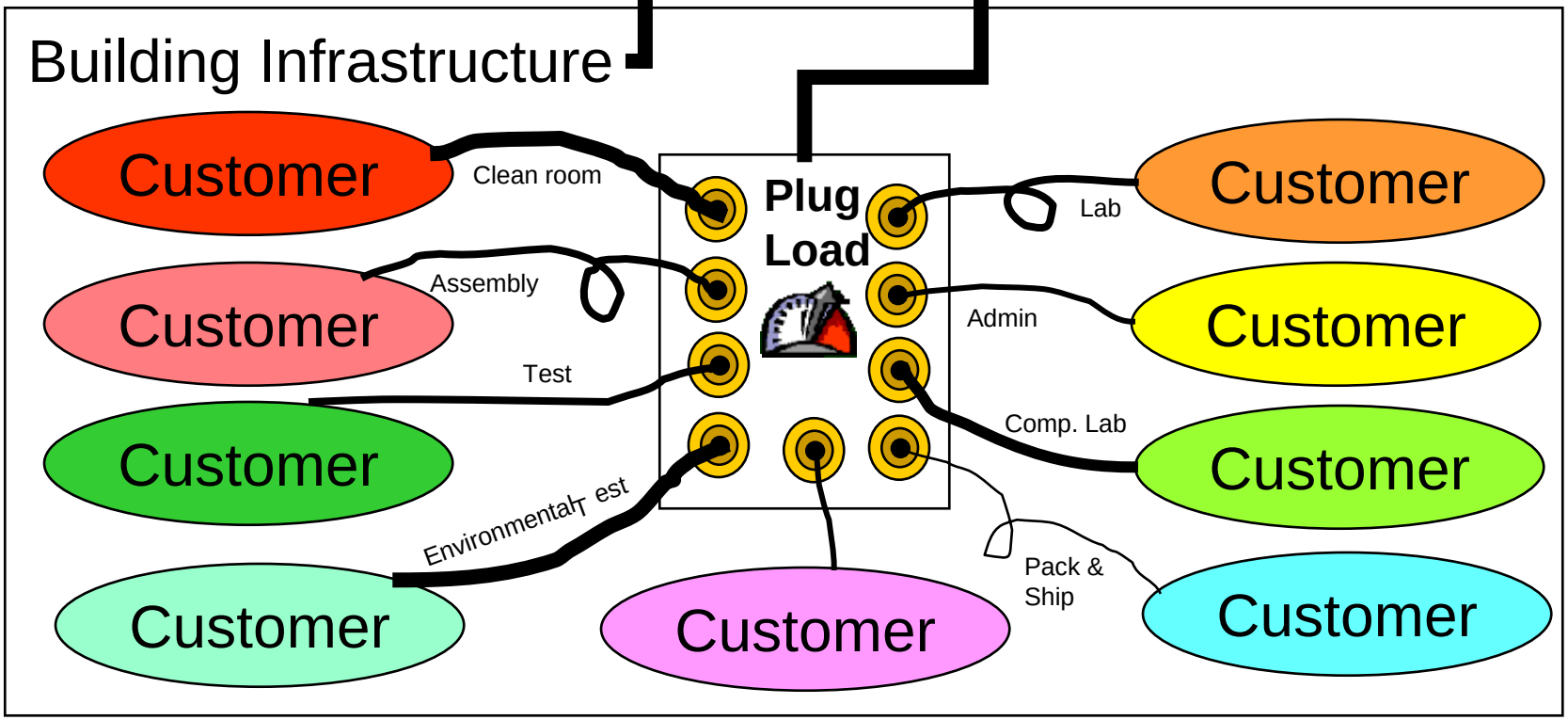
Help Make a Difference.

Conserve energy wherever you can!

Components of Building Energy Usage

Bldg Infrastructure =
20%-40% of consumption

Plug Load =
60%-80% of consumption

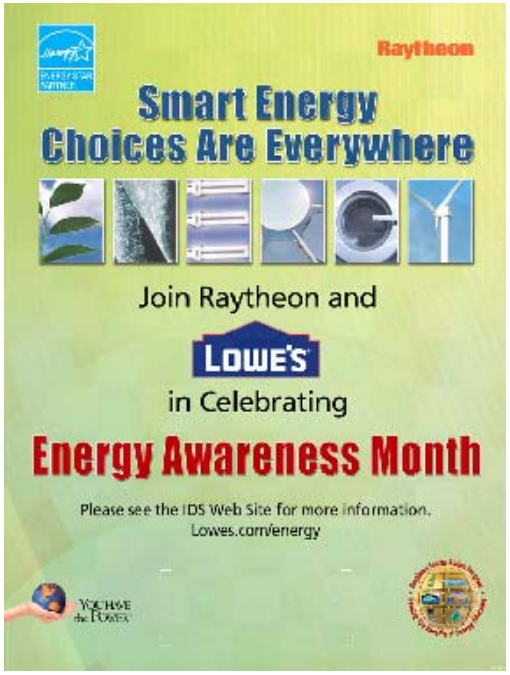


Plug Load must be managed

Strategy and Tactics

- Assemble Core Team to Drive Strategy
- Develop an energy intensity chart to target "big hitters"
- Identify Energy Champions in functional areas
- Energy Champions assemble local teams
- With R6s support, identify and quantify usage in each area to prioritize reductions:
  - Production, process & test equipment
  - Office Equipment (PCs, printers, monitors), etc.
  - Infrastructure (hoods, lighting, etc.)
- Identify Energy Consumption Measures (ECM)
- Local team brainstorms additional reduction opportunities, potential failure modes, and preventive plans
- Continually promote energy conservation

Employee Outreach



What can YOU do in the common areas?

- When leaving a conference room, ensure that any overhead lights are turned off.
- When using a TV monitor, computer or VCR in a demonstration, make sure you turn them off when you are done.
- Coffee pots, refrigerators and other appliances or equipment in common areas should be kept to a minimum.

What can YOU do at home?

- Use shades to keep out heat in the summer and to reduce the chill you feel from the windows in the winter.
- When not using your TV, computer, or DVD/VCR, make sure you turn them off when you are done.
- If you are thinking about purchasing new appliances, look for the ENERGY STAR models.
- Change a light and save a bundle. ENERGY STAR qualified light bulbs are 75% more efficient than incandescent bulbs. When just one room in every home is brightened by ENERGY STAR lighting, the change will keep over one trillion pounds of carbon dioxide out of our air.
- Seal air leaks and add insulation to your home. Purchase a hot water insulation kit to wrap your water heater and save on water heating costs. Or consider a tank-less water heater.
- Use an ENERGY STAR qualified programmable thermostat that can automatically adjust the temperature of your home when you are away.

Energy at IADC

On average since 2000, IADC has:

- Used 63,551,936 kilowatt hours (kwh) per year
  - Equal to powering 6355 US homes
  - Causes the equivalent pollution of 8262 vehicles
- Spent $6.4 million each year on energy
  - Approximately 85% was for electricity costs
  - Equals $1,732 per IADC employee each year!

Energy costs are on the rise . . . and there is no end in sight!

Where should you go for more information?
Visit: http://homenet.ray.com/rfac/reap.htm

Put in an Energy Suggestion at: http://homenet.ray.com/ids/energy.cfm

Raytheon

IDS Integrated Air Defense Center
Andover, MA

Raytheon

CLIMATE LEADERS

For years, Raytheon Company has been an active ENERGY STAR® partner with the U.S. Environmental Protection Agency (EPA) and U.S Department of Energy (DOE). In 2002, Raytheon joined the voluntary CLIMATE LEADERS® program, administered by the EPA. Raytheon's greenhouse gas (GHG) emissions are primarily from its energy consumption.

Through the efforts of employees, contractors and vendors, Raytheon has achieved significant reductions in waste, emissions, and energy consumption over the last several years. But we can do even more to hel combat global warming.

We encourage employees to adopt energ conservation habits at home and at work. We all have a stake in improving the bottom line and conserving our precious resources.

For more information, visit:
http://homenet.ray.com/rfac/reap.htm
Submit an Energy Suggestion at:
http://homenet.ray.com/ids/energy.cfm

YOU HAVE the POWER

Raytheon Energy Action Program – Reaping the Benefits of Energy Efficiency

energy ENERGY STAR PARTNER

Raytheon Enterprise Energy Team

Raytheon

R6σ Raytheon Six Sigma

"Each time we turn on a light or use a computer or other piece of equipment, we create an environmental impact from generating and using that energy. We have a moral and a business responsibility to use our energy resources wisely."

- Dan Smith, IDS President

Did you know . . .

An annual savings of approximately **$80** per workstation can be achieved by turning off computers and other miscellaneous office equipmen
at night and on the weekends.

Multiply this by 80,000 employees and Raytheon could see savings of at least ***$6 million each year!***

WOW!

Help us conserve energy by shutting off non-critical idle equipment and lights.

For more information, visit:
http://homenet.ray.com/rfac/reap.htm
Submit an Energy Suggestion at:
http://homenet.ray.com/ids/energy.cfm

YOU HAVE the POWER

Raytheon Energy Action Program – Reaping the Benefits of Energy Efficiency

energy ENERGY STAR PARTNER

Raytheon Enterprise Energy Team

Raytheon Ra

IDS OPERATIONS

Integrated Air Defense Center (IADC)

On average since 2000, IADC has:
- **Spent $6.4 million each year on energy**
  - **> Equals $1,732 per IADC employee each year**
  - **> Approx. 85% was for electricity costs**
- **Used 63,551,936 kilowatt hours (kwh) per year**
  - **> Equal to powering 6355 US homes**
  - **> Causes the equivalent pollution of 8262 cars**

Help preserve the environment and Raytheon's bottom line!

For more information, visit:
http://homenet.ray.com/rfac/reap.htm
Submit an Energy Suggestion at:
http://homenet.ray.com/ids/energy.cfm

YOU HAVE the POWER

Raytheon Energy Action Program – Reaping the Benefits of Energy Efficiency

energy ENERGY STAR PARTNER

Raytheon Enterprise Energy Team

Raytheon Enterprise Energy Team

VISION:

To lead a recognized Enterprise Energy Program that contributes to Raytheon Growth and Customer Success

MISSION:

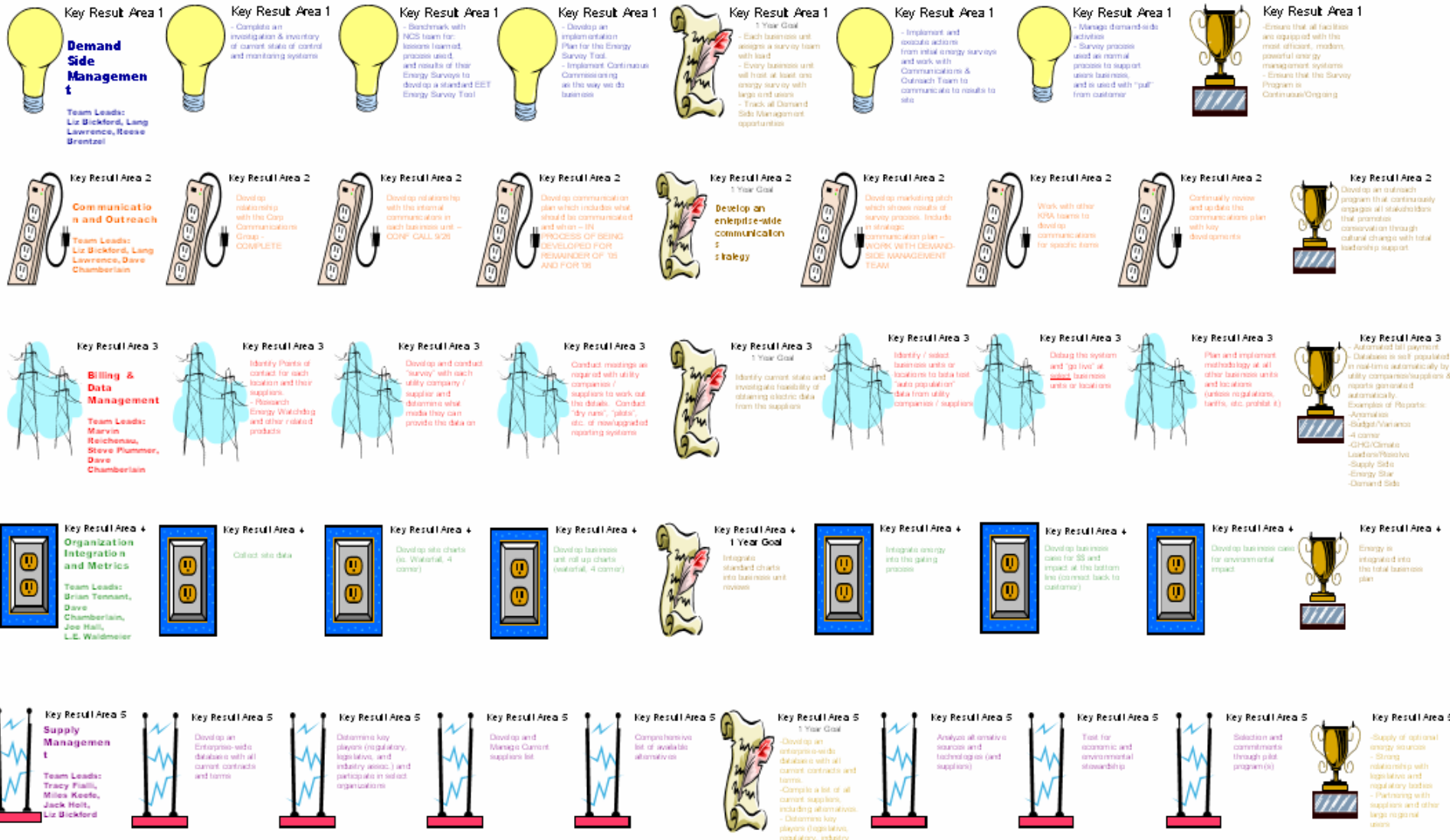
Enterprise Energy Team through the use of Raytheon Six Sigma processes focused on continuously:

- Reducing energy consumption by identifying and implementing savings initiatives
- Employing best technology and practices to achieve innovative solutions
- Recognizing and communicating achievements and performance

20+ professionals from 7 businesses

Vision:

To lead a recognized enterprise energy program that contributes to Raytheon growth and customer success.



Raytheon

DSM Survey Tool Process

What we have found successful

Current State

Manufacturing Process

Facilities Systems

Customer Requirements

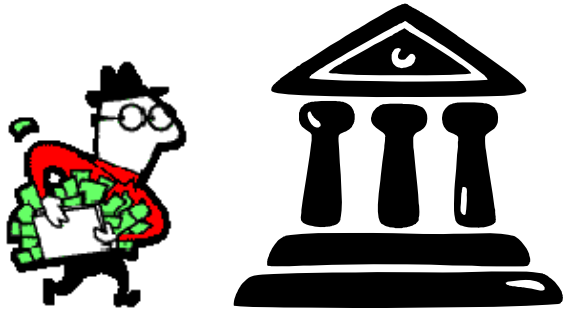
Manufacturing Operational Hours

Historical Energy Studies

Site Energy Goal Buy-in

Future State

Managed Consumption Reduction



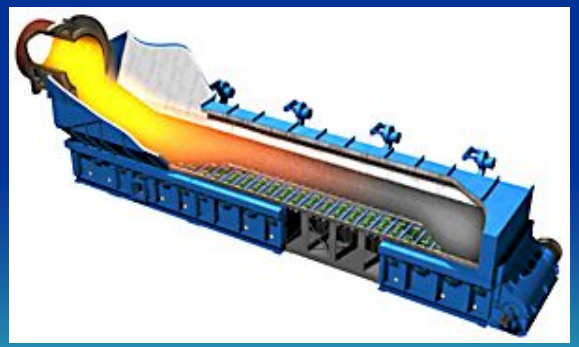
Controlled & Managed Cost

Need to implement methods to hold people accountable

California Portland Cement's GHG Management Program

Rick Jacobs
Chief Process Engineer
California Portland Cement Company

ENERGY STAR – Climate Leaders Web Conference
October 18, 2006



CPC's GHG Management Program

OVERVIEW

- Company Background
- Cement Process
- GHG Management Background
- Climate Leaders
- Benefits
- Challenges

CPC's GHG Management Program

Company Background

- Founded in 1891
- Producer of Cement, Concrete and Aggregates
- Recent merger with sister company – Glacier NW
- Facilities on West Coast from Alaska to California including Nevada
- 2000 Employees
- ~$1 Billion Annual Sales

CPC's GHG Management Program

Cement Process

- Energy intensive process – Conversion of car-sized rock to fine talcum powder

"Passing a mountain through the eye of a needle twice"

- Mining, crushing, blending, grinding, heating (3000 deg. F), cooling, conveying, grinding & shipping
- Energy as much as 30% of cost – 50% variable costs
- Typical power demand 22-27 MWatts
- Coal is primary fuel

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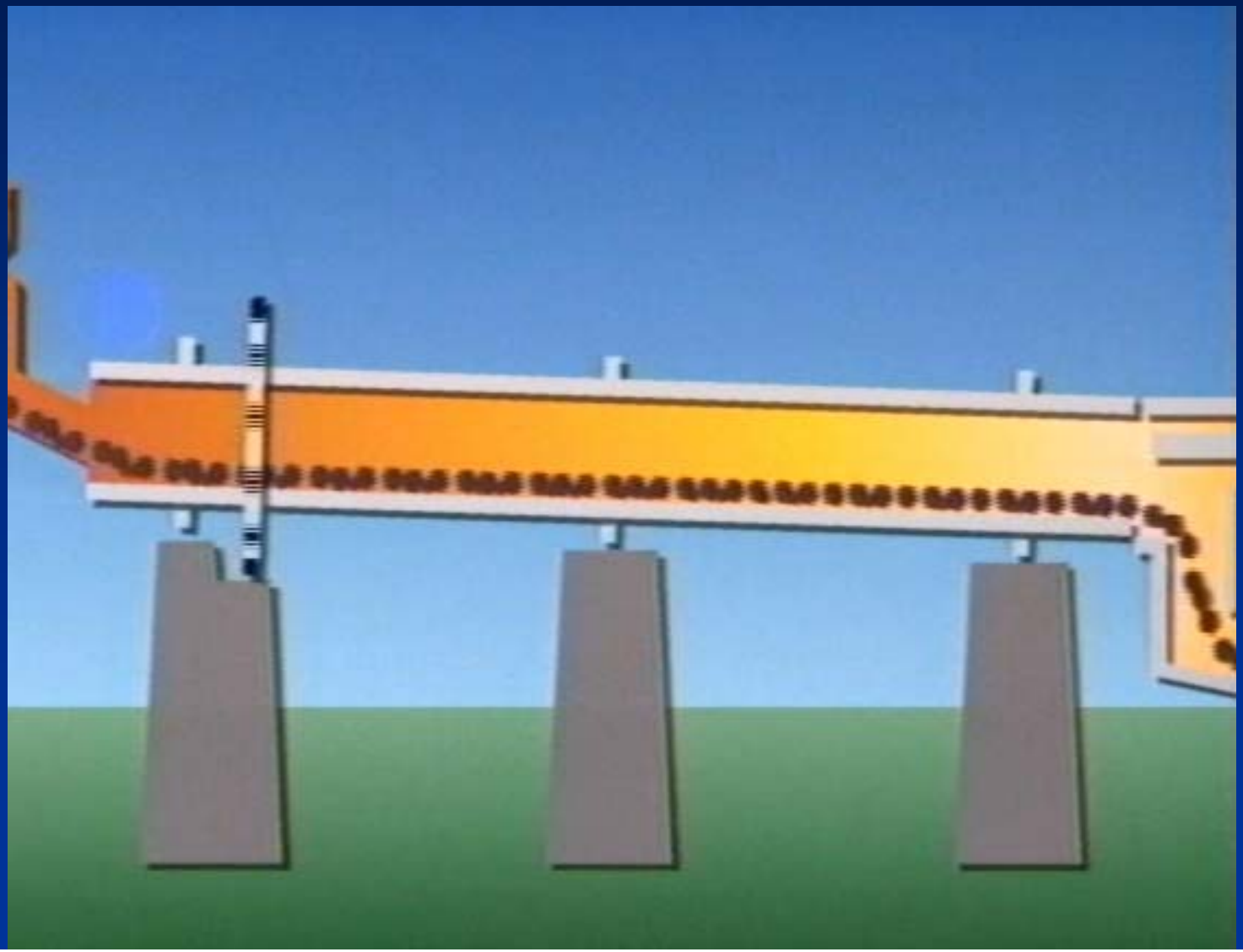
Preheater-Precalciner Tower & Kiln

Preheater-Precalciner Tower

- Air flows up
- Feed flows down & into Kiln

Material flows through rotary Kiln

Temperatures may reach 3000 deg. F




Finish Mill
SAFETY START
WARNING WHISTLE
1 LONG BLAST
FINISH MILL EQUIPMENT
2 SHORT BLASTS
RAW MILL EQUIPMENT

CPC's GHG Management Program

GHG Management Background

- DOE's EIA 1605(b) Voluntary Reporting of GHG Program
  - Reporting emissions for cement operations since 1996
- Process Emissions
  - $CaCO_3$ $CaO + CO_2$
  - Account for ~50% of emissions
- Emissions from energy
  - Stationary and mobile combustion, indirect emissions from electricity
  - Account for ~50% of emissions

CPC's GHG Management Program

EPA Climate Leaders

- Joined in 2005 to
  - Quantify emissions from all sources
  - Identify opportunities for GHG reduction
  - Promote the benefits of our energy management efforts
  - Support prior GHG reductions under future mandatory program

CPC's GHG Management Program

Being a Climate Leaders Partner

- Partnership agreement
- Develop GHG Inventory (base year)
- ***Develop Inventory Management Plan***
- ***Set aggressive GHG reduction goal***
- Report GHG emissions annually, track progress
- Be recognized for achievements

CPC's GHG Management Program

GHG Inventory

- Follows WRI/WBCSD Protocol
- Includes emissions of ***CO_2, CH_4, N_2O, HFC's***, PFC's, SF_6
  - Combustion (stationary and mobile)
  - Process Emissions
  - Refrigeration & Air Conditioning
  - Indirect emissions from purchased electricity

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CPC's GHG Management Program

GHG Management

- Corporate Engineering group supports data collection and management
- Management review of goal
- Goal set based on proposed business plan and energy management initiatives
- Intensity based goal to allow for future expansion and changing market demand

CPC's GHG Management Program

GHG Goal

- Intensity goal by carbon intensity index (CII):

$$\mathrm{CII} = 100 \times \frac{\mathrm{Total\,CO_2}}{\mathrm{P1} \times \mathrm{P1}i + \mathrm{P2} \times \mathrm{P2}i + \mathrm{P3} \times \mathrm{P3}i}$$

Total CO_2 is the total CO_2 equivalent emissions for the report year

P1 is production of product 1 in the report year

P1*i* is the CO_2 intensity for the base year

P2 is production of product 2…

- By definition the CII is 100 in the base year
- CPC goal: 9% reduction per production index from 2003 to 2012

CPC's GHG Management Program

Benefits of having a GHG management program

- Quantifying the results of energy management efforts
- Energy (thus, GHG) reduction efforts help the bottom line due to increasing energy costs
- Raising public awareness of efforts
- Climate Leaders technical assistance
- Climate Leaders recognition opportunities

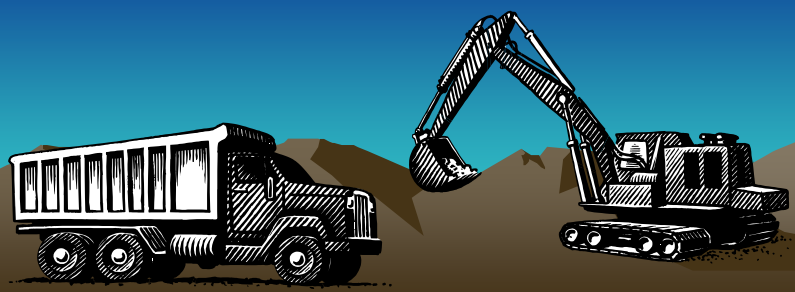
CPC's GHG Management Program

Challenges/Future Actions

- Quantifying the results of energy management efforts…
- 80/20 rule applies
- Obtaining/maintaining data
- Involvement of key personnel – facilities, EHS, management
- Institutionalizing GHG data collection

CPC's GHG Management Program

QUESTIONS?



What Climate Leaders Means For Your Business

- Public recognition
- Technical inventorying assistance
- Better manage GHG emissions and associated risks
- Become a well-informed player in policy discussions
- Integration with State, Regional, and International GHG accounting schemes
- Peer exchange
- Bottom line benefits

"We believe that climate change requires immediate action. Our efforts to address this issue have typically led to improved efficiencies and other business benefits. Working together with Climate Leaders, I believe we can show that climate change is not only a serious problem, but a real business opportunity."
- Arthur J. Gibson, Vice President, Environment Health & Safety, Baxter International Inc.

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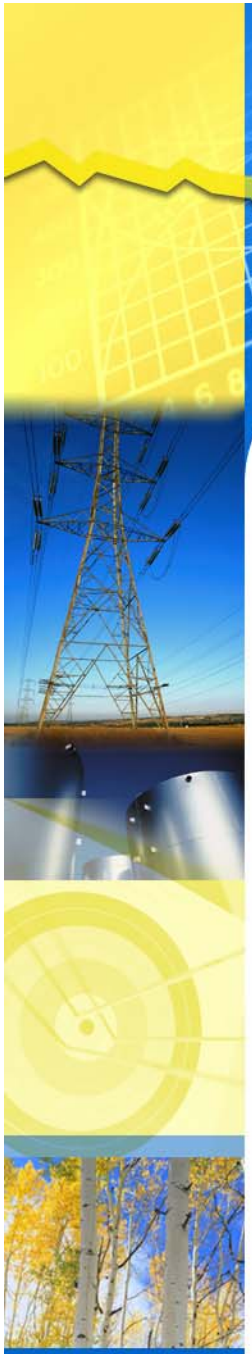
U.S. Environmental Protection Agency



Free Technical Assistance

Climate Leaders provides expert technical assistance to

- Understand the Climate Leaders GHG Protocol
- Create a high-quality GHG inventory
- Develop an inventory management plan

"Realizing that these GHG reductions represented a corporate asset that the company wanted to protect, Frito-Lay chose the highly transparent, rigorous, and credible reporting process offered by Climate Leaders."
- Larry E. Perry, P.E., Frito Lay North America

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High-Level Public Recognition

Climate Leaders Partners receive high-level recognition via:

- Press events
- Partner meetings, newsletters, website
- Articles in local, national, and trade press
- Public Service Announcements (PSAs) in mainstream press

The 2005-2006 magazine campaign included placement in US News & World Report, Forbes, Entrepreneur, Inc. & Golf

- Total Circulation: **6.1 million**
- Total Ad Value: **> $1 million**

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Why Act Now?

- Save $$ – bottom line benefits from efficiency
- Become well-informed player in policy discussions
- Shareholders/public expect it
- Business opportunities

EPA can help:

- >100 Partners, more than half Fortune 500
- GHG goals prevent annual emissions of 7 million cars

"While some assume that cutting carbon dioxide emissions cost businesses money, we have found just the opposite. Addressing climate change makes business sense. We have saved more than $100 million since 1998 by conserving energy."
- Wayne Balta, Vice President, Corporate Environmental Affairs and Product Safety, IBM

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Contact Information

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For More Information on Climate Leaders:
www.epa.gov/climateleaders

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Questions & Discussion

Upcoming Web Conferences

October 24 – ENERGY STAR Partner of Year Awards – Application Briefing

November 15 – Energy Management Diagnostics

Download past web conference presentations at:
www.energystar.gov/networking

Questions or comments? Contact: tunnessen.walt@epa.gov

Thank You!