



CMP Value Drivers for EHS Initiatives

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Raytheon

Customer Success Is Our Mission

Raytheon ... Who We Are

We are ...

- A technology leader specializing in defense, homeland security and other government markets throughout the world.
- 2006 Sales: \$20.3 billion
- More than 73,000 employees worldwide
- Headquarters: Waltham, Massachusetts

Our Vision ...

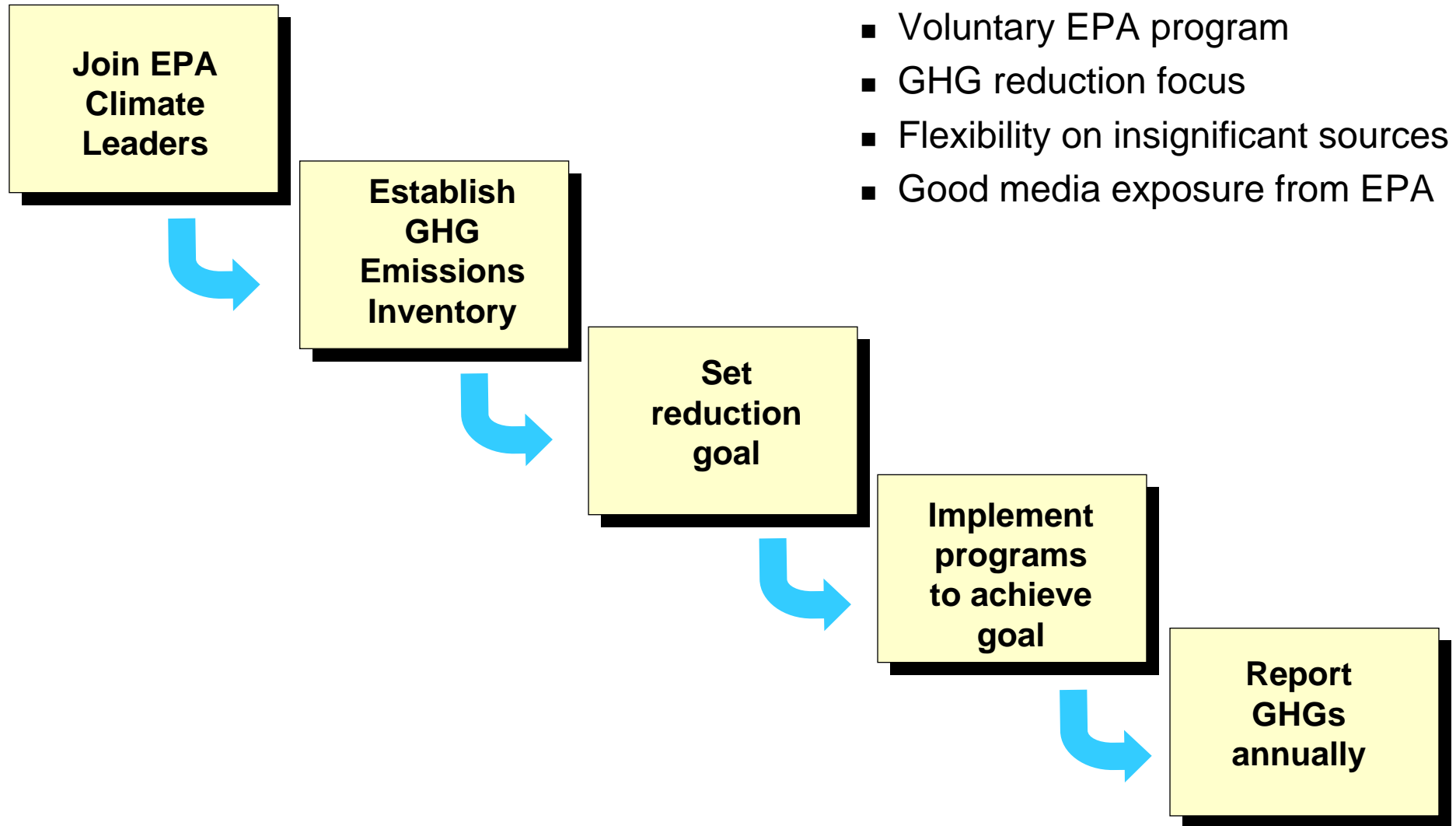
To be the most admired defense and aerospace systems supplier through world-class people and technology.

Global leader in technology and innovation

CMP Value Drivers

- Consolidated information sources
 - Constituent, consumption, point of usage, etc.
 - Powerful in evaluating future “what if” scenarios
- Ability to identify key issues
 - By chemical, work area, product line, business, etc.
- Ability to isolate materials/products of concern
 - Identify the big hitters
 - Understand scope of issue
- Common conduit to raise awareness/institute controls
 - Log-on messages, specialized order prompts, etc.
 - Ability to review orders prior to placement

Climate Leaders Program Steps



- Voluntary EPA program
- GHG reduction focus
- Flexibility on insignificant sources
- Good media exposure from EPA

Voluntary action is critical to avoid mandatory GHG controls

Sources of GHG Emissions

- Indirect Emissions
 - Electricity
 - Hot water and chilled water

- Direct Emissions
 - Natural Gas
 - Fuel Oil
 - Mobile sources
 - Industrial processes
 - Refrigerants

Six Greenhouse Gases:

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

Greenhouse Gases - Impact Factors

	Greenhouse Gas Chemical	Global Warming Potential (GWP)
1	Carbon Dioxide (CO ₂)	1
2	Methane (CH ₄)	21
3	Nitrous Oxide (N ₂ O)	310
4	Hydrofluorocarbons (HFCs) (examples)	
	HFC-43-10mee	1,300
	HFC 134a	1,300
	HFC 152a	2,900
	HFC 23	11,700
5	Perfluorocarbons (PFCs) (examples)	
	PFC compounds C5-18	7,400
	PFC-14	6,500
6	Sulfur Hexafluoride (SF ₆)	23,900

Greenhouse Gas Emissions:

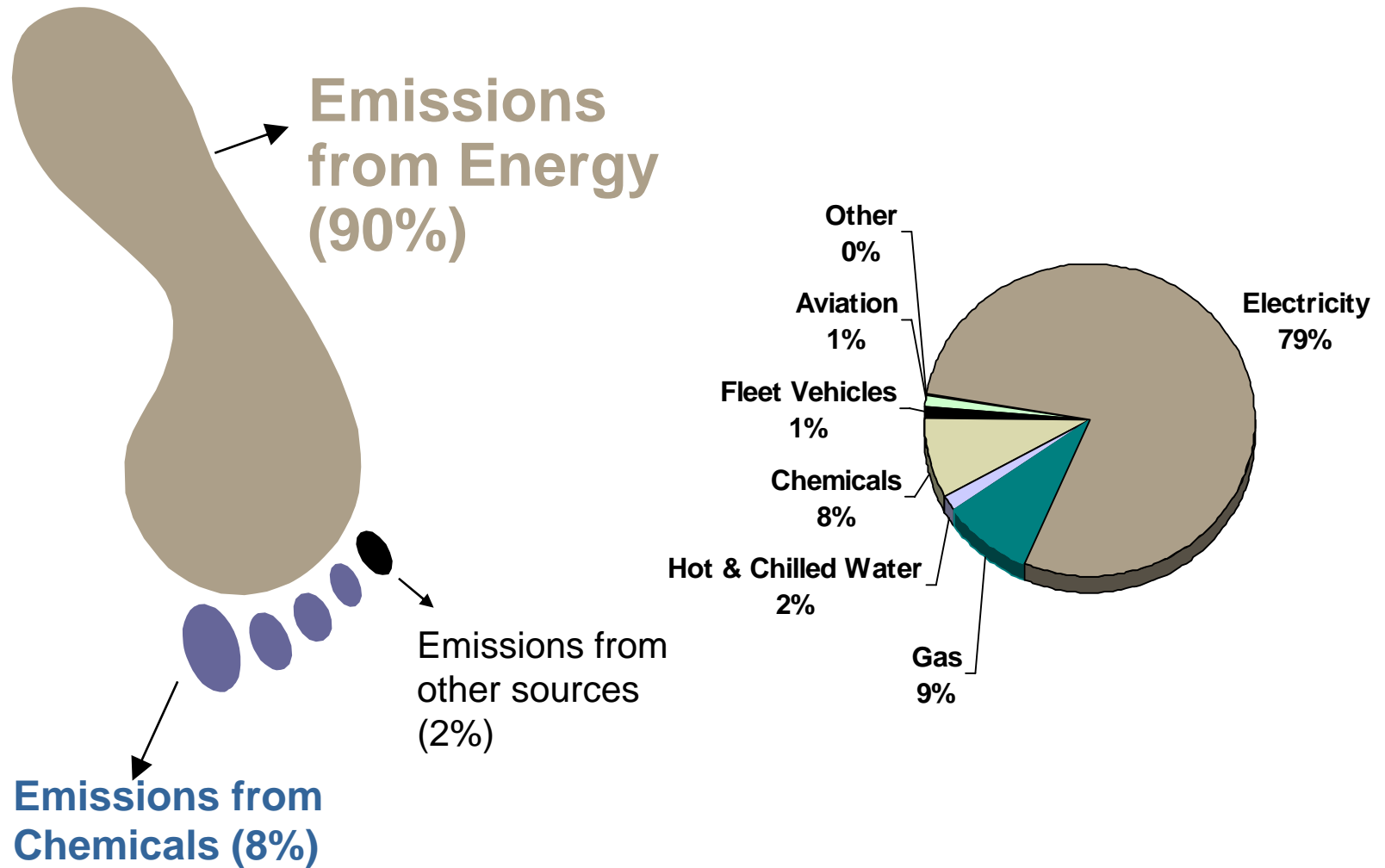
Standard Unit of Measurement is metric tons of CO₂ equivalent emissions

Tons x GWP = CO2 equivalent emissions

Methodology based on EPA's Greenhouse Gas Inventory and the "Greenhouse Gas Protocol" by the World Resources Institute and the World Business Council for Sustainable Development



Raytheon's GHG Profile



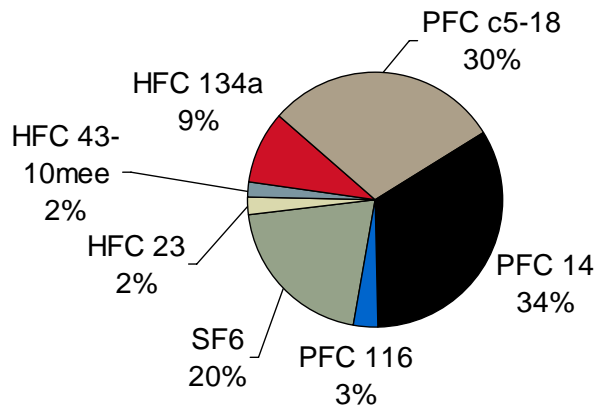
GHG Reduction Goals From Selected Companies

- **Raytheon** - 33% reduction per \$B revenue, 2002 - 2009
- **Lockheed Martin** - 30% reduction per \$B revenue, 2001 - 2010
- **Wal-Mart** - 20% reduction over 8 years
- **DuPont** - 15% reduction, 2004 - 2015
- **General Electric** - 1% reduction, 2004 - 2012
- **Johnson & Johnson** - 14% reduction, 2001 - 2010
- **United Technologies** - 12% reduction, 2006 - 2010
- **Gap** - 11% reduction per square foot, 2003 - 2008

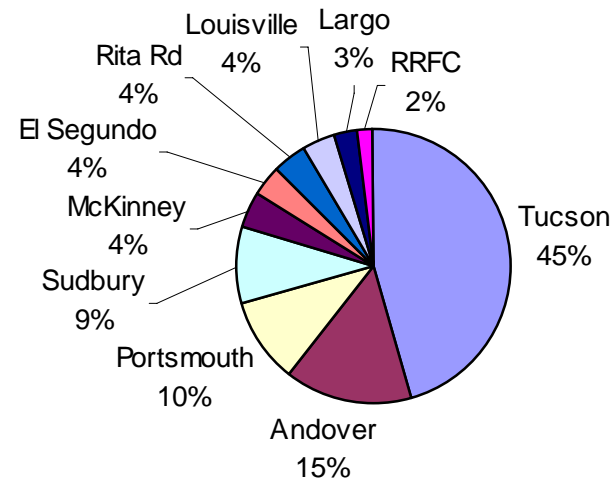


CMP Value – Identifying the Key Areas

GHG Chemical Emissions - By Chemical



GHG Chemical Emissions - By Site



- **4 chemicals = 90% of emissions:**
- **Perfluorocarbon Compounds**
 - Fluorinerts, 3M, PFC 14
 - PFC 14: rapid cooling test
 - PFCc5-18: leak test fluid, dielectric fluids
- **Sulfur Hexafluoride (SF6)**
 - Leak test gas, dielectric gas
- **Hydrofluorocarbon (HFC) 134a**
 - Propellant

- **Canned GHG database report**
- **Data identifies**
 - Product
 - Constituent
 - Work Area
 - Site
- **CMP database allowed quick identification on where need to start**

CMP Value – Isolating the Issue

- “Canned air” use in circuit card assembly cleaning
 - HFC 134a propellant used since ESD concerns
- CMP database identified contaminant / magnitude of issue
 - 25 cans / week
- Evaluated alternates
 - Secondary treatment of plant compressed air
 - Work area system to remove particulates & moisture
- Good success story
 - CMP database helped quickly isolate the issue
 - 200 tons/year CO2 equivalent GHG reduction
 - \$10K/yr cost saving ; ROI < 8 months
 - Intangible risk reduction from less chemical use



CMP Value – Raising Awareness

- Robust database supports order evaluation and messaging

- Piloting a process to have EHS review key GHG material requisitions
 - Quick check with requestor to see if can substitute or use smaller quantity
 - Several immediate successes
 - 1000 tons of “avoided” GHG emissions in 4 months

- Piloting message shown to requestor on the GHG impact of the order
 - Displays Order Quantity x GWP = GHG impact from that order
 - Regular reminder to minimize order quantity and evaluate alternates

- Modifying reporting tools to show GHG impact of chemical orders
 - Ability to use in future planning “what if” exercises

A minimal amount of intervention can yield meaningful results

CMP Improvement Opportunities

- Order filters to require secondary review for strategic opportunities
- Systems/services to focus at measuring consumption –vs- purchase
 - Some overestimating in reports since people measure what is bought
- More rigorous linking to alternate substitute resources
 - Process and industry focused –vs- all-in-one

Long term improvements benefit the CMP supplier and the customer

Shrinking Our Footprint

3M
Advanced Micro Devices, Inc.
American Electric Power
Anheuser-Busch Companies, Inc.
Ball Corporation
Baltimore Aircoil Company
Bank of America Corporation
Baxter International Inc.
Boise Cascade
California Portland Cement Co.
Calpine
Caterpillar Inc.
Coddling Enterprises
The Collins Companies
Conservation Services Group
Cummins Inc.
DuPont Company
Eastman Kodak Company
Ecoprint Corporation
Exelon Corporation
Fairchild Semiconductor
First Environment

FPL Group, Inc.
Frito-Lay, Inc.
Gap Inc.
General Electric Company
General Motors Corporation
Green Mountain Energy Company
Hasbro, Inc.
Haworth, Inc.
Hologic (US) Inc.
HSBC - North America
IBM Corporation
Intel Corporation
Interface, Inc.
International Paper
Johnson & Johnson
Lockheed Martin Corporation
Mack Trucks, Inc.
National Instruments Corporation
Parker Hannifin Corporation
Pfizer Inc.
PSEG
Raytheon Company
Roche Group U.S. Affiliates
SC Johnson
Shaklee Corporation
Sutter Health Corporation
Tetra Pak
The UPS Store
United Therapeutics Corporation
Volvo Trucks North America, Inc.
The World Bank
Xerox Corporation

**Their footprint is getting smaller.
Yours can too.**

EPA congratulates these Climate Leaders for taking action to reduce their greenhouse gas emissions and carbon footprint. To learn how your company can join the effort to address climate change, go to www.epa.gov/climateleaders

CLIMATE LEADERS
U.S. Environmental Protection Agency