

Climate Leaders 5th Anniversary Meeting

The Raytheon Energy Conservation Program

Steve Fugarazzo
Manager Facilities Engineering

Integrated Defense Systems

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Strategic Business Areas



Missile Defense

*Sensors; interceptors;
command and control; systems integration*



Intelligence, Surveillance and Reconnaissance

Enabling information dominance



Precision Engagement

Shortening the sensor-to-shooter timeline



Homeland Security

Solutions for a safer world

Raytheon Business Headquarters

The map shows the following business headquarters locations:

- Space and Airborne Systems**: El Segundo, CA (Image: Aircraft cockpit view)
- Missile Systems**: Tucson, AZ (Image: Rocket launch)
- Network Centric Systems**: McKinney, TX (Image: Aircraft engine components)
- Intelligence and Information Systems**: Garland, TX (Image: Person at computer workstation)
- Integrated Defense Systems**: Tewksbury, MA (Image: Radar dome at night)
- Global Headquarters**: Waltham, MA (Image: Office building with flags)
- Raytheon Technical Services Company LLC**: Reston, VA (Image: Aircraft on tarmac)

80,000 Employees, \$20B Revenue, > 36 M Sq Ft

Energy Conservation at Raytheon

- **New Facilities design, retrofits & upgrades**
- **Construction and commissioning processes**
- **Education programs**
- **Partnering with the EPA**
 - **Energy Star**
 - **Climate Leaders**
- **Benchmarking**

Raytheon is an Employer of choice

DO YOU KNOW :

- The amount of energy consumed by building infrastructure?

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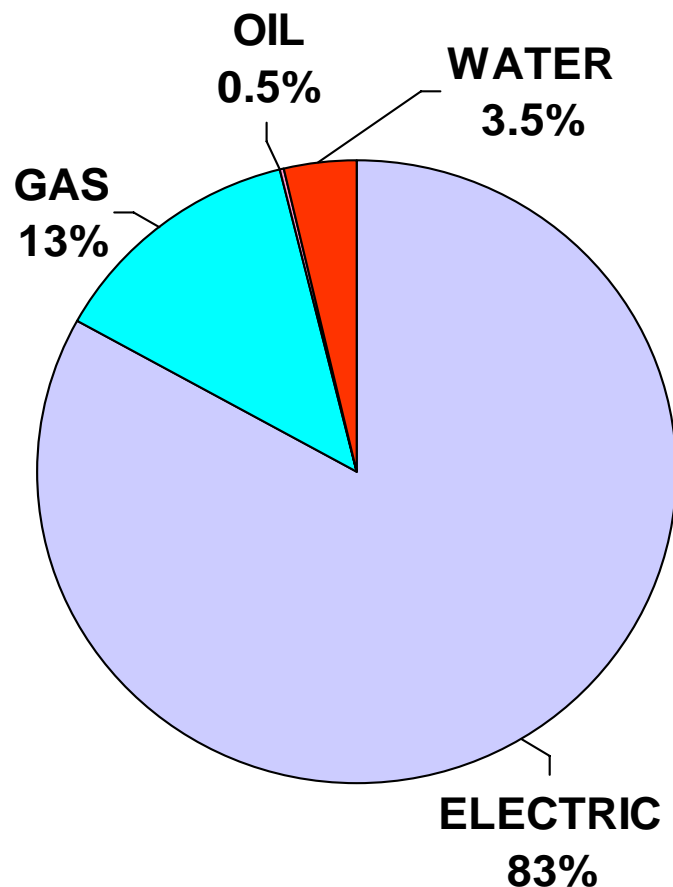
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Energy Conservation Needs to be more
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**EHS needs to connect w/ Energy
Consumption/Reduction !!!!**

Energy Cost Breakdown



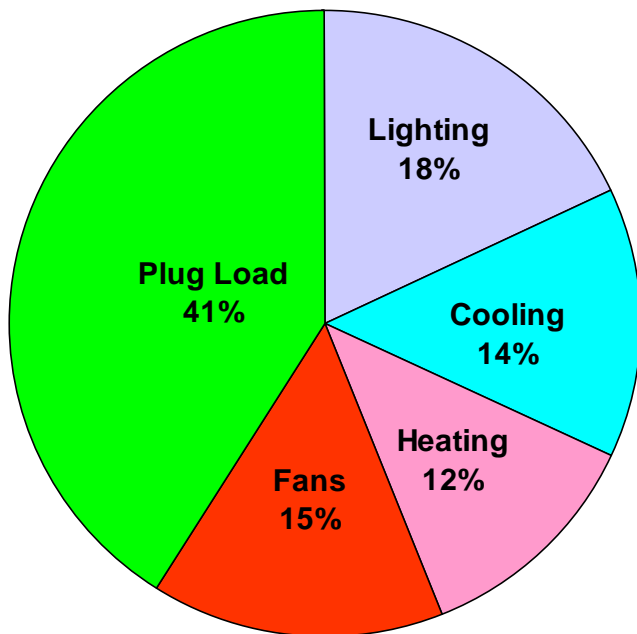
Raytheon major sites consumed 1,386,667 MWH in 2006:

- An average household in the United States uses 10 MWH per year
- Raytheon major sites consumed the equivalent of 140,000 households
- Equivalent to a city of 500,000 people

A Top Down Energy Conservation Program is needed

Energy Usage

Estimated Aggregate for Northeast Locations



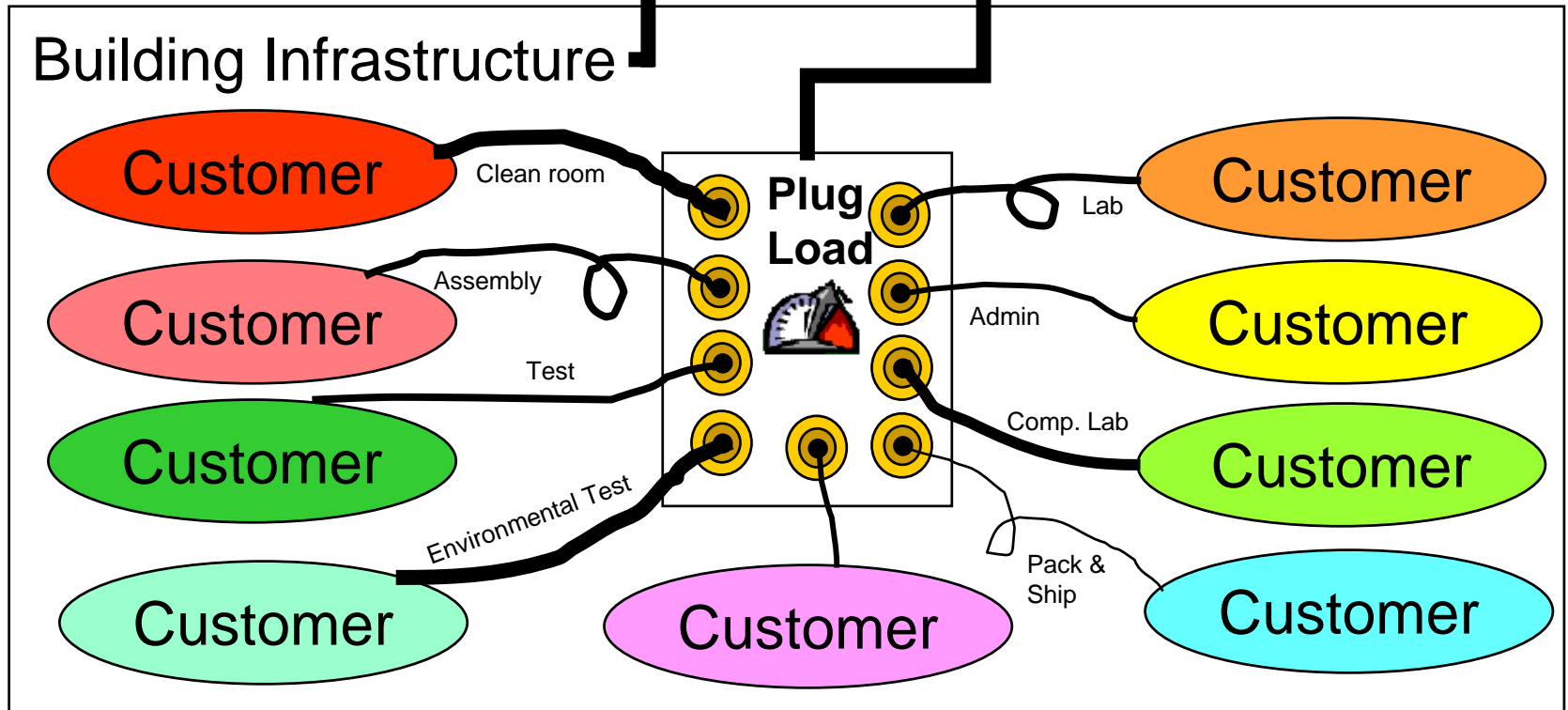
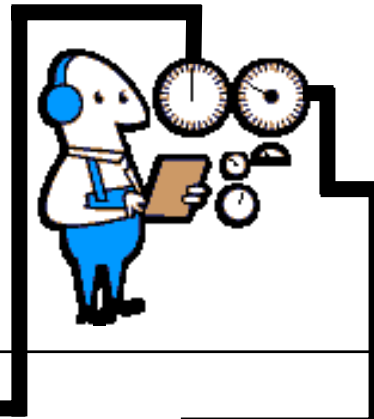
- ◆ Facilities continually upgrades equipment to reduce energy costs
- ◆ Lighting, cooling, heating and fan energy influenced by occupants

All personnel need to help shrink Plug Load

Components of Building Utility Usage

Bldg Infrastructure = 20%-40% of consumption

Plug Load = 60%-80% of consumption



Plug Load must be managed

Raytheon's Roadmap to Enterprise Energy Management

Raytheon's Energy Conservation for a Competitive Advantage Program

1. Energy - The Current State
2. The Need for Energy Conservation \$ & GHG
3. Communications and Outreach
4. Energy Intensity Chart
5. **Plug Load**
6. Energy Conservation Measure (ECM) Log
7. Energy Champions
8. Enterprise Energy Team
9. Metrics - Goal Tracking

Total Employee Involvement (TEI)

Focus Areas

1. Energy Metrics and Budgeting
2. Energy Procurement
3. Demand Side Management
4. Energy Efficient Design
5. Energy Awareness
6. Operations and Maintenance
7. Alternative Energy Technologies
8. Energy Star Partnership

Strategy and Tactics

- Assemble Core Team to Drive Strategy
- Develop an energy intensity “stop light” chart
- Identify Energy Champions in each functional area
- Energy Champions assemble local team
- 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.)
- Record Energy Consumption Measures (ECM)
- Local team brainstorms additional reduction opportunities, potential failure modes, and preventive plans
- Continually promote energy conservation in each area

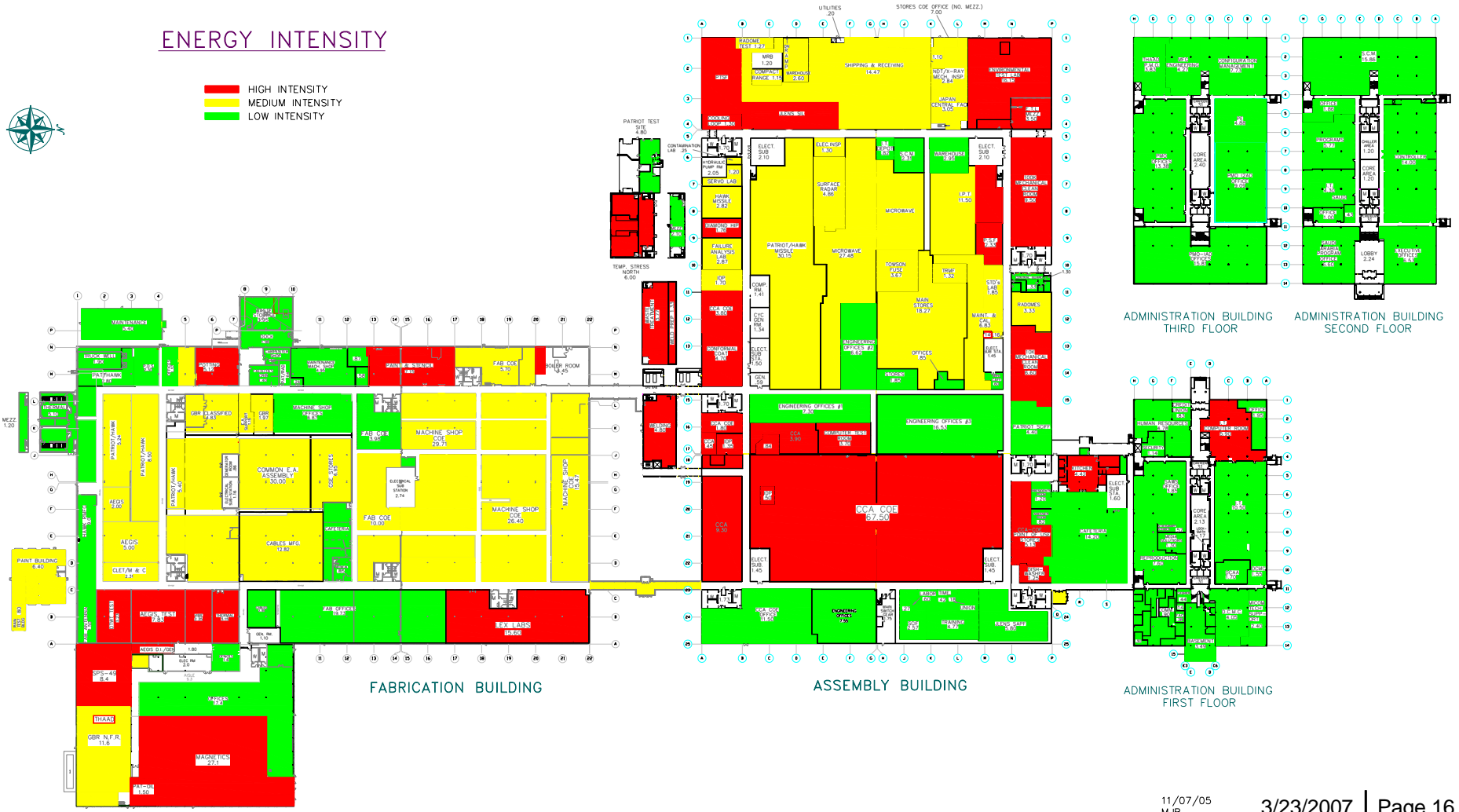


ENERGY INTENSITY Stop Light Example - IADC

Raytheon INTEGRATED AIR DEFENSE CENTER

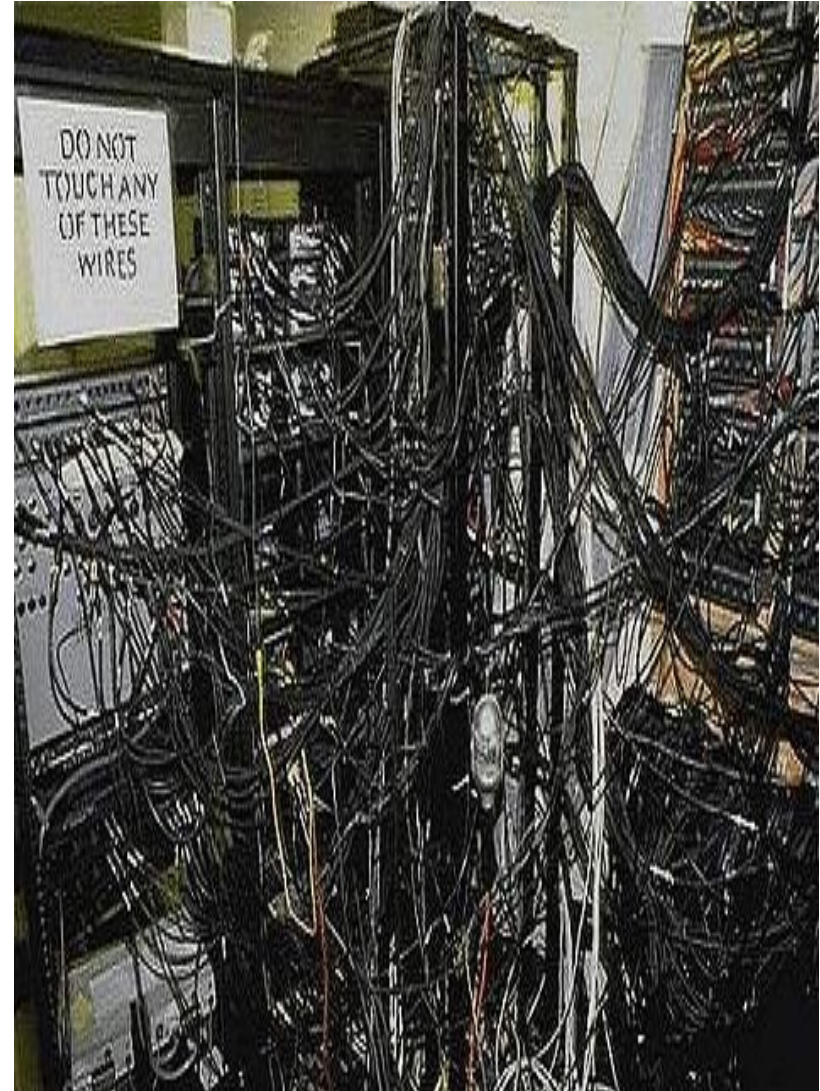
ENERGY INTENSITY

- HIGH INTENSITY
- MEDIUM INTENSITY
- LOW INTENSITY



Untangling the Plug Load

- What is contributing to plug load?
- How often are these devices left on?
- Why?
- How can we get people to turn them off?
- What processes/tools/equipment uses the most energy?
- When is equipment used?
- When is it needed?
- When can it be turned off?
- What are the run times currently?
- Can the time the equipment is powered be reduced?
- Can the equipment be run off-shift (off peak)?
- Are there alternatives to this equipment?
- Can equipment needs be reduced?



January 2007 OPM

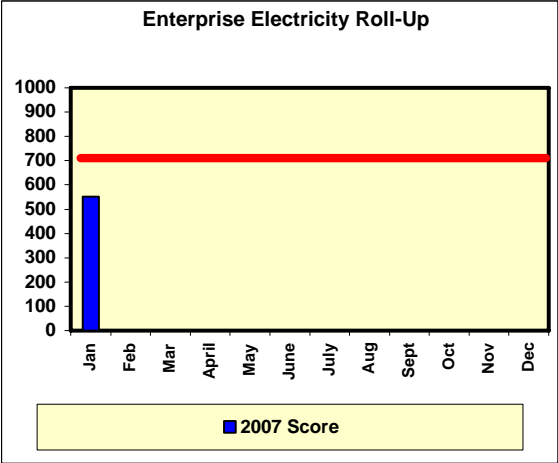
Electricity Performance as of Jan-07						
Corporate	IDS	IIS	NCS	RMS	RTSC	SAS
86.18%	85.10%	85.04%	90.29%	87.97%	91.81%	89.05%
83.00%	83.00%	83.00%	83.00%	83.00%	83.00%	83.00%
83.67%	83.67%	83.67%	83.67%	83.67%	83.67%	83.67%
84.33%	84.33%	84.33%	84.33%	84.33%	84.33%	84.33%
85.00%	85.00%	85.00%	85.00%	85.00%	85.00%	85.00%
88.75%	88.75%	88.75%	88.75%	88.75%	88.75%	88.75%
92.50%	92.50%	92.50%	92.50%	92.50%	92.50%	92.50%
96.25%	96.25%	96.25%	96.25%	96.25%	96.25%	96.25%
100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
103.75%	103.75%	103.75%	103.75%	103.75%	103.75%	103.75%
107.50%	107.50%	107.50%	107.50%	107.50%	107.50%	107.50%
111.25%	111.25%	111.25%	111.25%	111.25%	111.25%	111.25%
6	6	6	5	6	5	5
1.0	18.0	15.0	28.0	17.0	3.0	18.0
6.0	108.0	90.0	140.0	102.0	15.0	90.0

Total Monthly Performance Score

551

Current Performance

10	Exceptional
9	
8	
7	Goal
6	
5	Satisfactory
4	
3	Baseline
2	
1	Unsatisfactory
0	



Comments on Data:

Baseline is set at 2005 KWH actuals adjusted for business impacts during 2006 and 2007. Goal is set at 15% reduction from adjusted baseline.

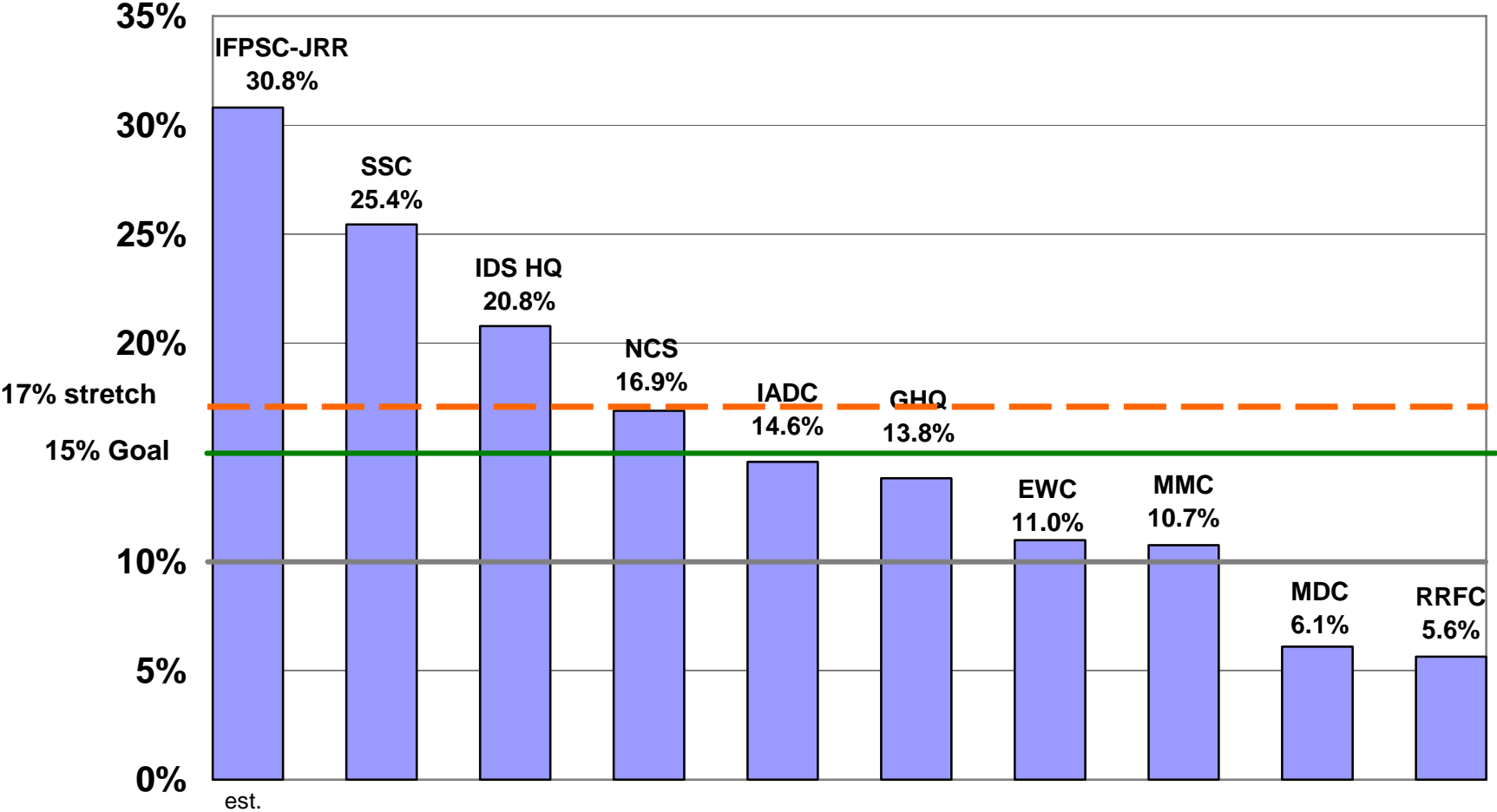
Weighted by 2007 adjusted baseline MWH for each business compared to total. See additional comments in box below.

Estimates Required to Complete OPM:

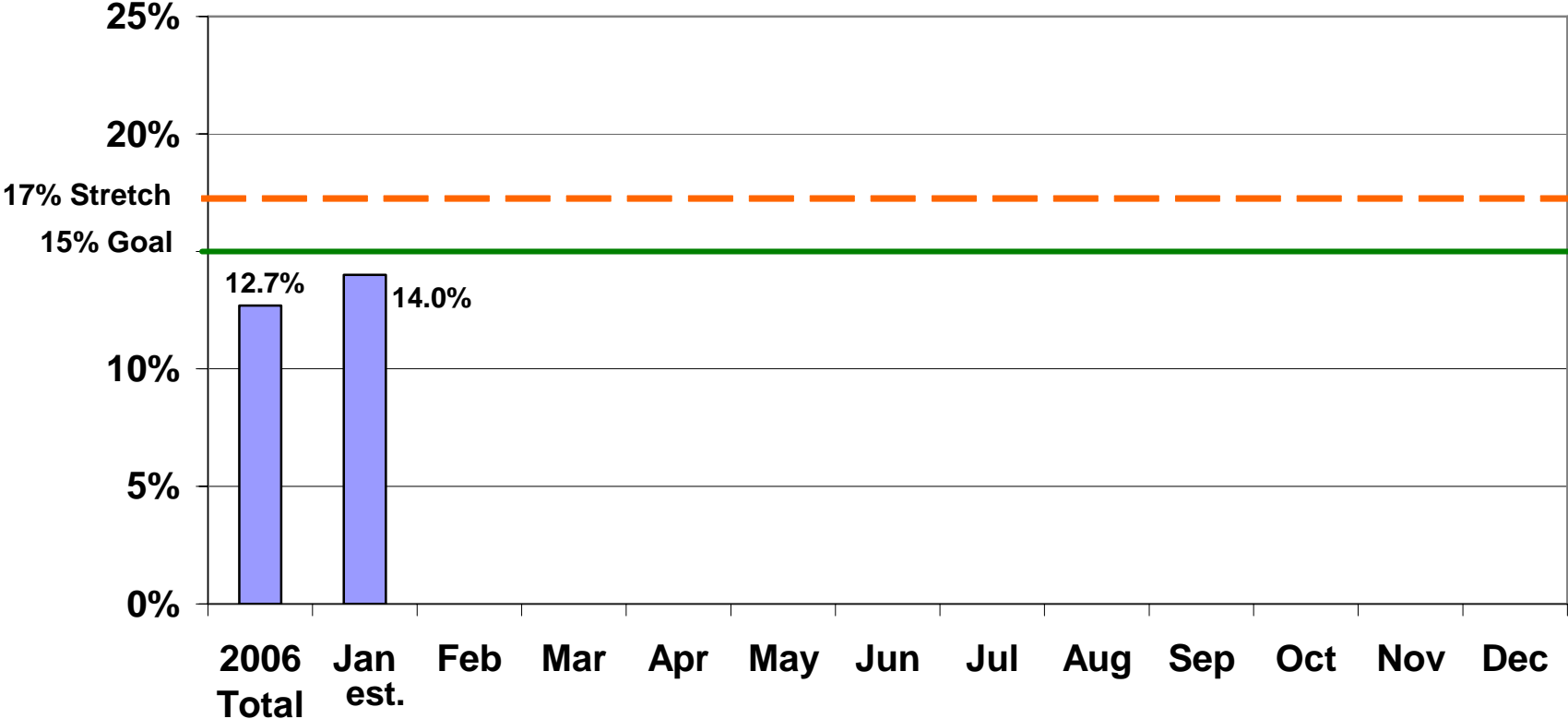
IDS: 1 of 10 sites estimated Jan (Huntsville)
 IIS: 0 of 7 sites estimated
 NCS: 5 of 13 sites estimated for Jan (Fort Wayne, Fullerton, Goleta, Lompoc, Spring Creek)
 RMS: 1 of 5 sites estimated Jan (Tucson)
 RTSC: All sites estimated
 SAS: 3 of 3 sites estimated Jan (Goleta EW, El Segundo, Forest)

Comments on Performance:
 The weights for January are estimated since the baselines for all businesses had not been established at the time of this OPM release. RTSC Jan 2007 performance estimated at Dec 2006 performance since 2007 baseline still in process (several more locations included in 2007 compared to 2006).

Business Center Performance to Goal YTD January

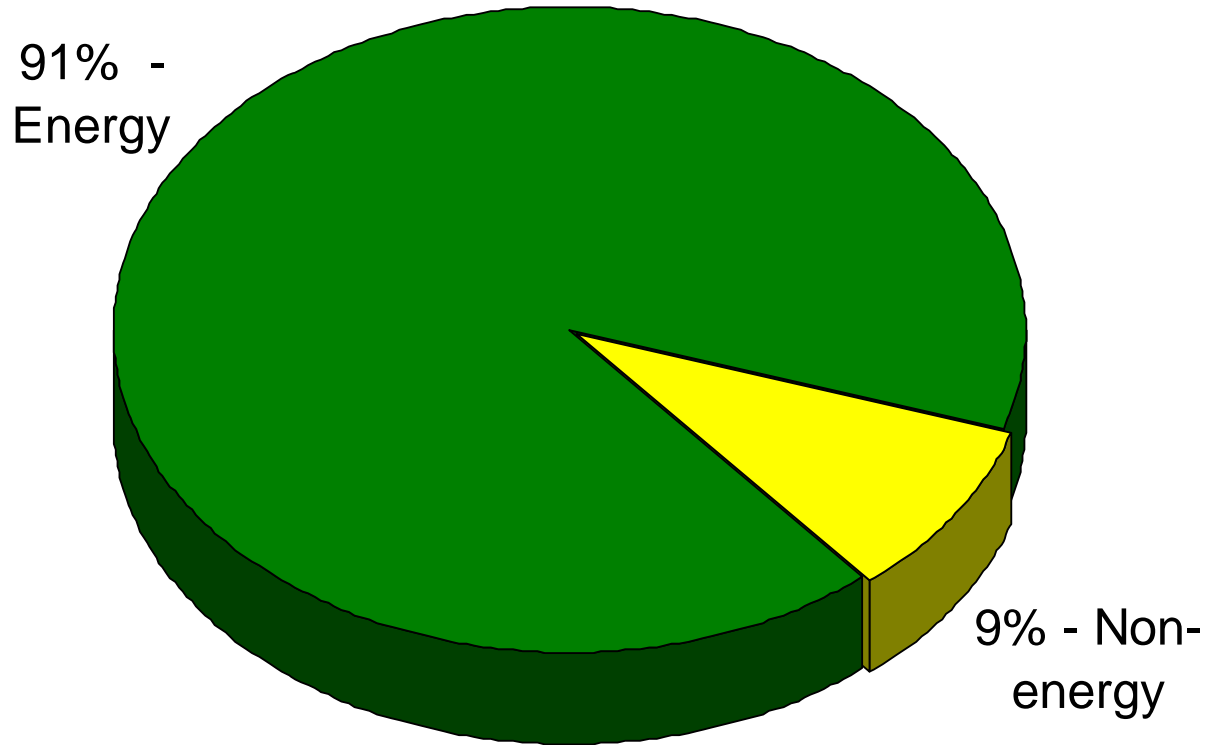


IDS Roll-Up Total Monthly YTD Performance to Goal



Centers included in this roll-up are: IADC, MMC, SSC, IDS HQ, MDC, EWC, IFPSC-JRR & RRFC. Not Included: GHQ & NCS Marlboro

Sources of Raytheon's Greenhouse Gas Emissions



1,000,000 metric tons of GHG emissions

CO₂ Inventory

	Emission Source	CO ₂ Equivalent Emissions (metric tons)	%
Energy	Electricity Consumption	695,580	72%
	Natural Gas Consumption	111,259	11%
	Purchased Steam and Chilled Water	73,242	8%
	Oil Combustion	1,189	0.1%
	Total Energy	881,270	91%
Non Energy	Manufacturing Chemicals	67,091	7%
	Aviation	12,296	1%
	Company Vehicles	7,767	1%
	Refrigerants	1,119	0.1%
	Total Non-Energy	88,273	9%
	Total	969,543	100%

A GHG Reduction Goal is an Energy Goal

Voluntary Partnerships



Energy Star



Leadership in Energy & Environmental
Design



Climate Leaders

GET INVOLVED

What we have found successful

Current State

Manufacturing
Process

Facilities Systems

Customer
Requirements

Operating Hours

Historical Energy
Studies

What we have found successful

Current State

Manufacturing Process



Facilities Systems



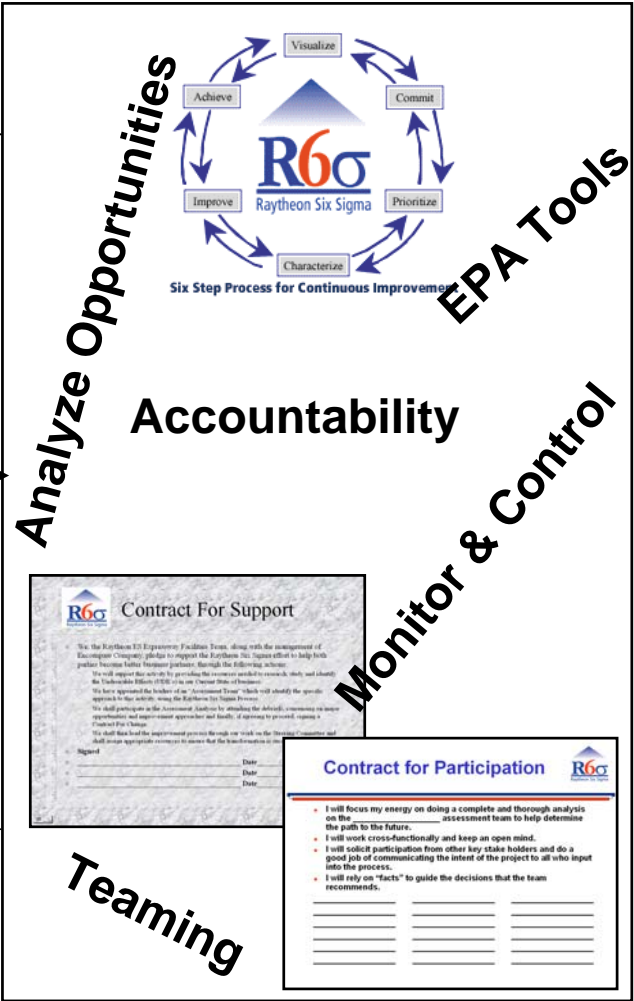
Customer Requirements



Operating Hours



Historical Energy Studies



What we have found successful

Current State

Future State

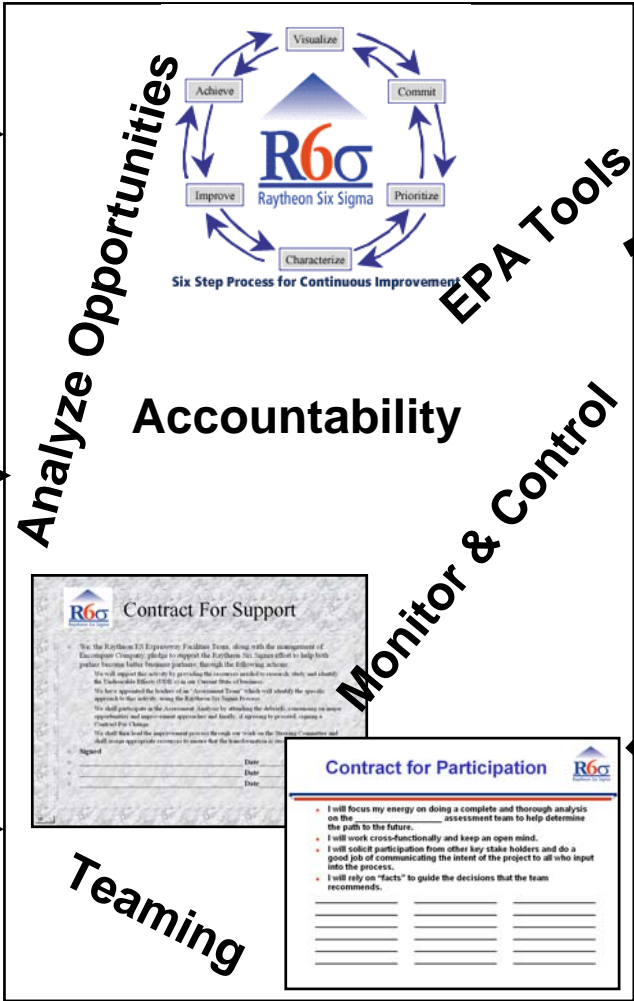
Manufacturing Process

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Reduced Consumption

Managed Cost

Reduced Carbon Footprint

What we have found successful

Current State

Future State

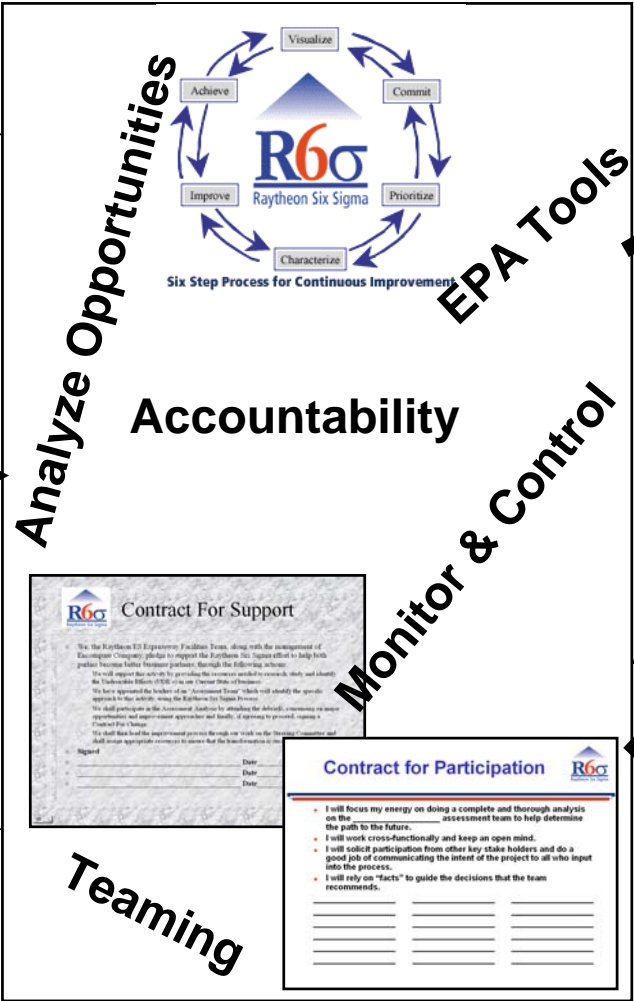
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Reduced Consumption



Managed Cost

Reduced Carbon Footprint

Need to implement methods to hold people accountable



YOU HAVE
the POWER.

*Help Make a Difference.
Conserve energy wherever you can!*



Thank You

Any Questions
?????