



CATERPILLAR FINANCIAL

JOURNEY TO SUSTAINABILITY

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Agenda

- **History of Caterpillar Financial**
- **The Journey**
 - **January 2005 – May 2007**
 - **May 2007 – January 2008**
 - **January 2008 – August 2008**
 - **August 2008 – March 2009**



Agenda (cont'd)

- **Building Improvements Before Certification**
- **Building Improvements After Certification**
- **Results**
 - **Comparison to other Green Buildings**
 - **More Results**
 - **Reduction of Electricity/Water/Solid Waste**
- **Next Steps**
- **Projects Under Review**
- **Lessons Learned**
- **Cost Considerations**
- **Future Market Trends**
- **USGBC Message**
- **Closing Comments**

LEADERSHIP

“A leader’s job is to look into the future and see the organization not as it is...but as it can become.” – Author Unknown



Building Improvements Before Certification

- Restructured all O&M practices
- Initiated recycling program
- Sustainability Committee/website
- Tested water and air
- Replaced cooling tower chemicals w/ozone
- Installed lowest Mercury level lights
- Eliminated styrofoam (#6), glass & black plastic
- Initiated composting
- Installed Merv 13 filters in AHUs
- Initiated car/van pooling/preferred parking spots
- Infrared building envelope
- Inspected, repaired and balanced bldg VAV units

Bldg Improvements After Certification

Initiated project to reclaim water

Changed building cleaning schedule

Installed low flow shower heads

Mini trash cans/blue recycle cans

Sleep mode software on all PCs

Installed rain sensor for landscaping

Initiated composting of paper towels

Electric car station in garage

Upgraded BAS system with additional BCUs



Cat Results vs Other Green Buildings

	Average Green Building Performance	Caterpillar Financial Performance 2008/2009
Electricity	30% Less	6%/20% Less
Water	30% to 50% Less	22%/28% Less
Solid Waste	50% to 90% Less	67%/73% Less
Btu/SqFt/Yr*	65,000 or Less	100,000/88,000

MORE RESULTS

Energy Star Awarded achieved March 2010

Trees Saved – 1160 trees in 2009, 1589 in 2008 (36% reduction in recycled paper)

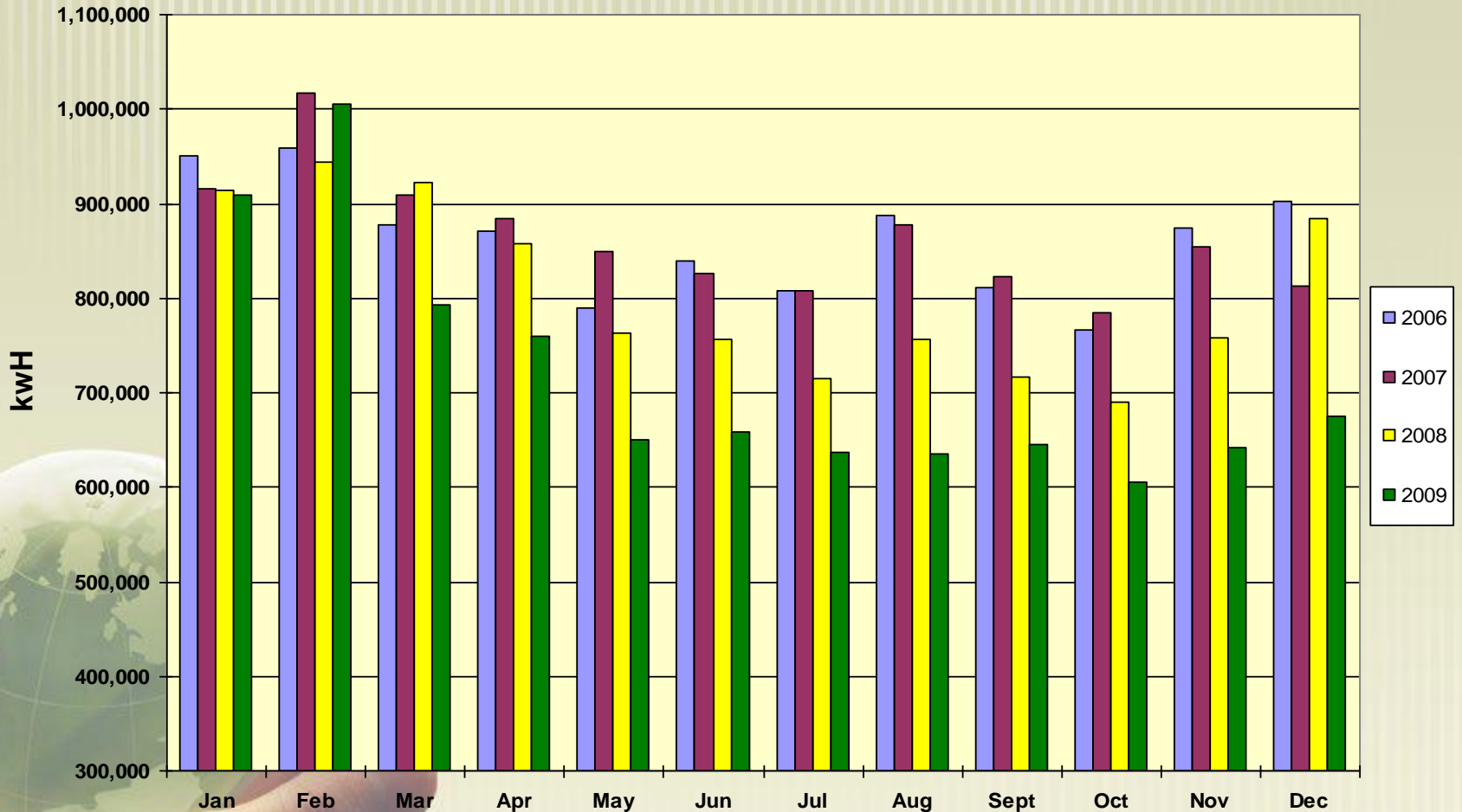
Carbon Emissions – Reduced by 12%

Solid Waste – 390,000 lbs (07); 170,000 lbs (08); 91,000 lbs (09)



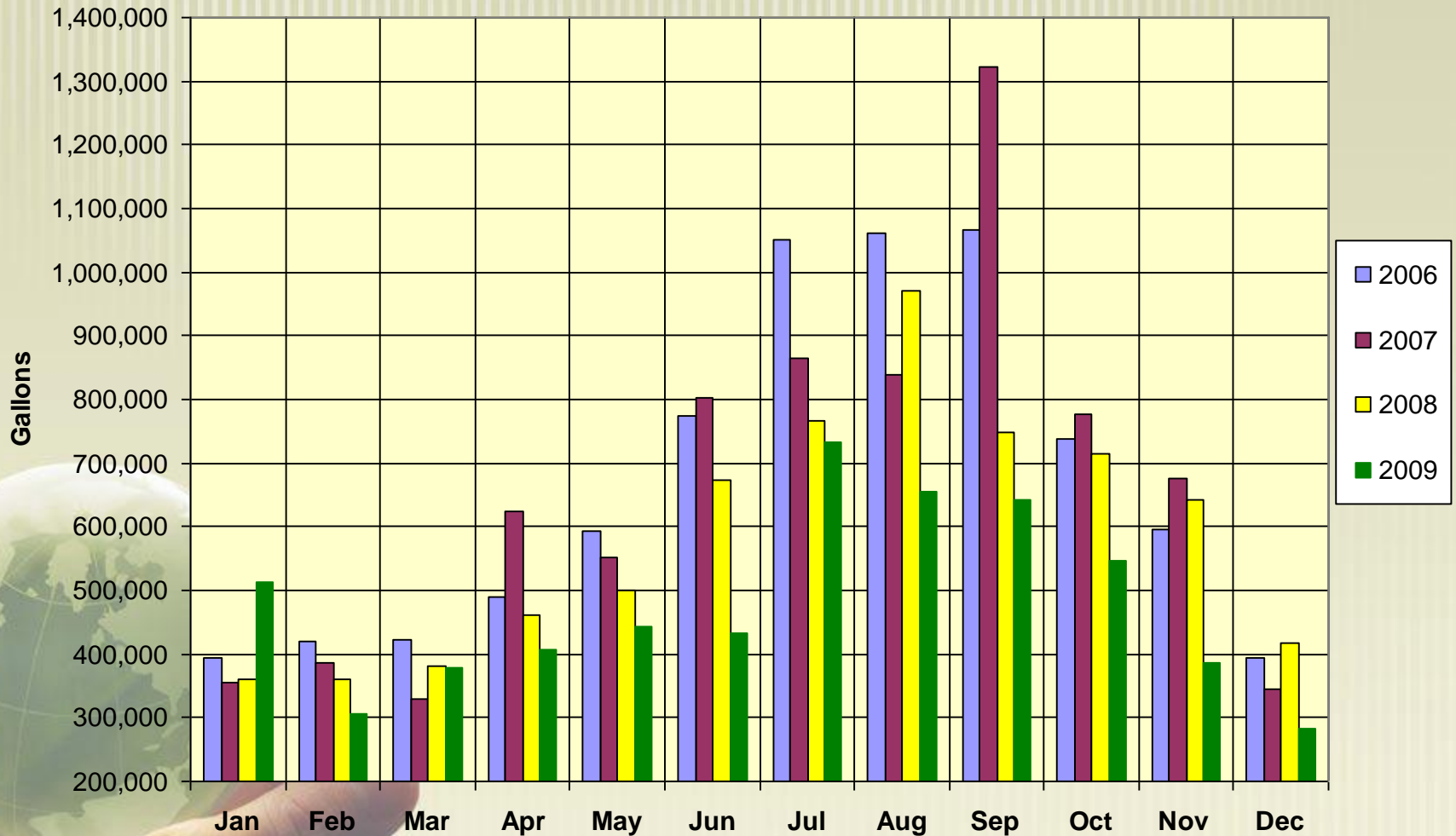
Reduction of Electricity Usage

Electrical Four Year Comparison- Usage



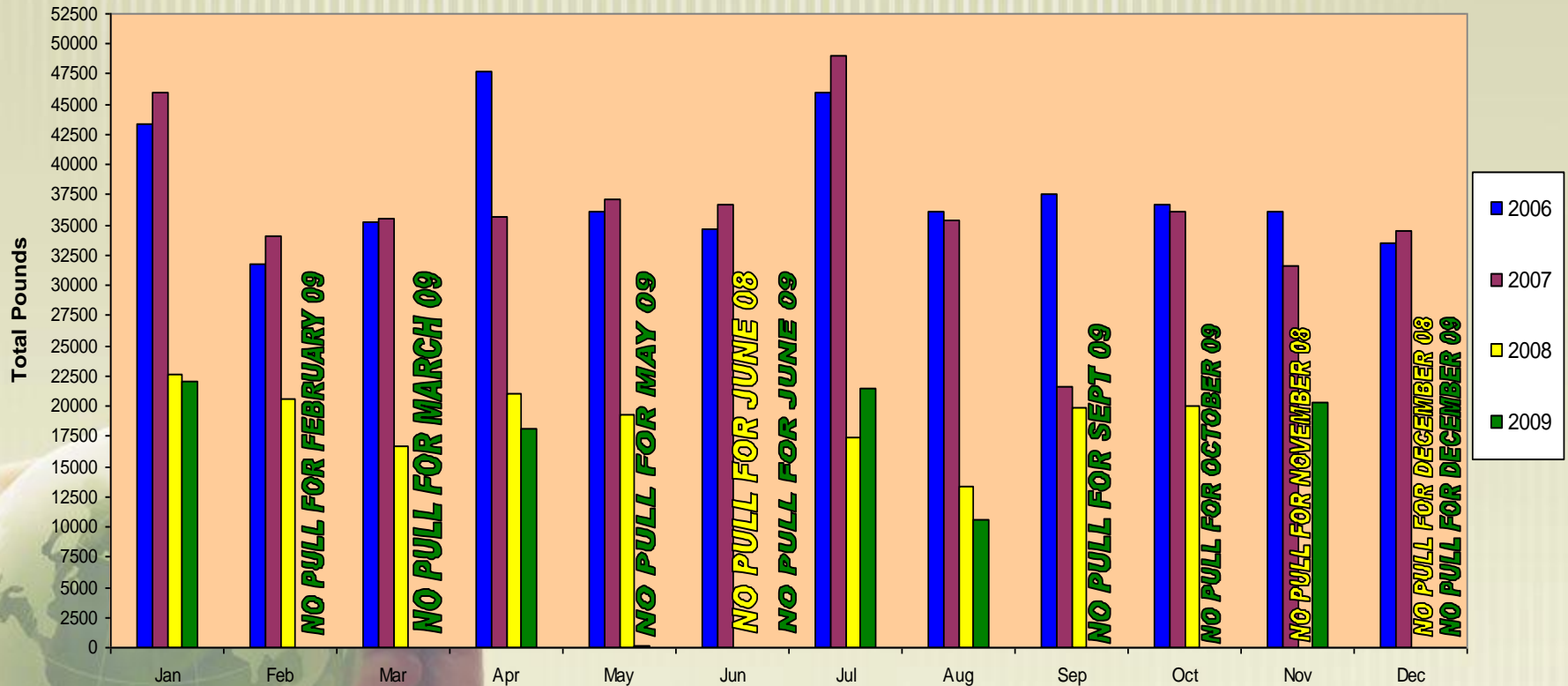
Reduction of Water Usage

Water Four Year Comparison- Usage



Reduction of Solid Waste

Landfill Totals
2006-2009



NEXT STEPS

- **Continue to seek economical ways to reduce electricity, water and solid waste – an on-going challenge**
- **2020 Goals: 0 Net Energy, 0 Water, 0 Solid Waste**
- **Introduce LEED practices to international offices**
- **Encourage vendors to incorporate sustainable Product Life Cycle Assessment – Cradle to Cradle**
- **Continuous Recommissioning of HVAC System**
- **Re-certification in 5 Years (2014)**



Projects Under Review

- **Install cooling tower motor VFDs**
- **Add automatic lighting controls to BAS**
- **Replace cooling tower fill and drift eliminators**
- **Submeter indoor plumbing and domestic hot water**
- **Install VFDs for rooftop fresh air intake and exhaust fans**



LESSONS LEARNED

Start project by writing a vision and mission statement

Learn all you can about certification

Once certified, improve continuously

Low Hanging Fruit

Continuous recommissioning

Make recycling convenient

Form a sustainability committee/website

Engage contractors early on

Allow 12-18 months for project

Complete energy audit upgrades before starting performance period

Appoint a green champion

Get senior management commitment & support



SOME LOW HANGING FRUIT

Turn off lights

Adjust thermostats

Turn off equipment

Reduce plug loads

Duplex printing

Adjust cleaning schedules

Install Motion sensors

Add Task lights



COSTS CONSIDERATIONS

Costs vary with project

Costs are immediate/benefits long term

Explore tax incentives, credits and rebates

Consider a ESCO/performance contract

LEED does not require capital investments

Review 2007 cost study – Davis Langton

Registration fees - \$900/\$1200

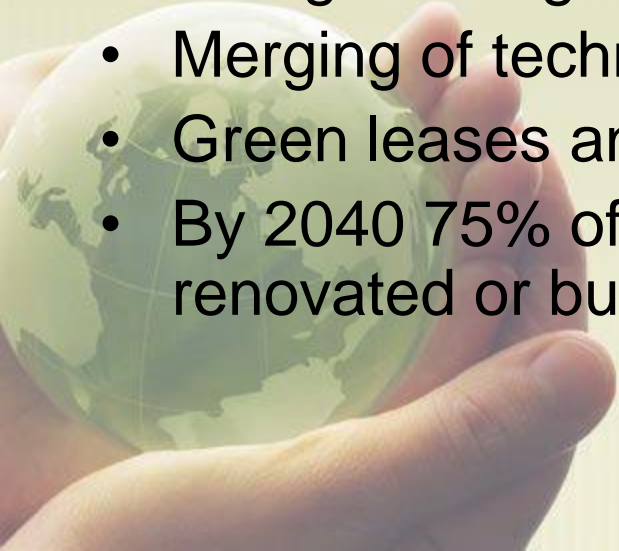
Application fees – Depends on size of bldg

Cat certification cost - \$1.25 sqft (less than 3 year payback)



FUTURE MARKET TRENDS

- Watch California (April 2009/Los Angeles)
- Greening of bldgs is becoming a major market trend worldwide/Water will be next major trend
- Green Building Codes
- GSA mandates all new bldgs to be LEED certified (CAT, too) – States can't be far behind
- Energy labeling
- Living building challenge/100% recyclable bldgs
- Merging of technology w/ building systems
- Green leases and energy efficiency initiatives
- By 2040 75% of bldgs then in operations will have been renovated or built new



USGBC MESSAGE

You, as organizational leaders in the green building movement, and as individual professionals – will be needed to make sure that the tremendous potential of the “green strings” attached to billions of dollars in federal investments fulfill their promise. The professional capacity of our community that has been built around new construction will need to be refocused on our existing buildings so that initiatives like the Obama Administration’s commitment to retrofit 75% of all federal buildings will serve as an exceptional business case and build momentum to drive the market forward. As McKinsey and Company has documented, there is more than \$160 Billion of cost-saving potential in our existing building stock. Your commitment to help fulfill the vision of a sustainable built environment will help make it a reality.

USGBC Newsletter of January 29, 2009

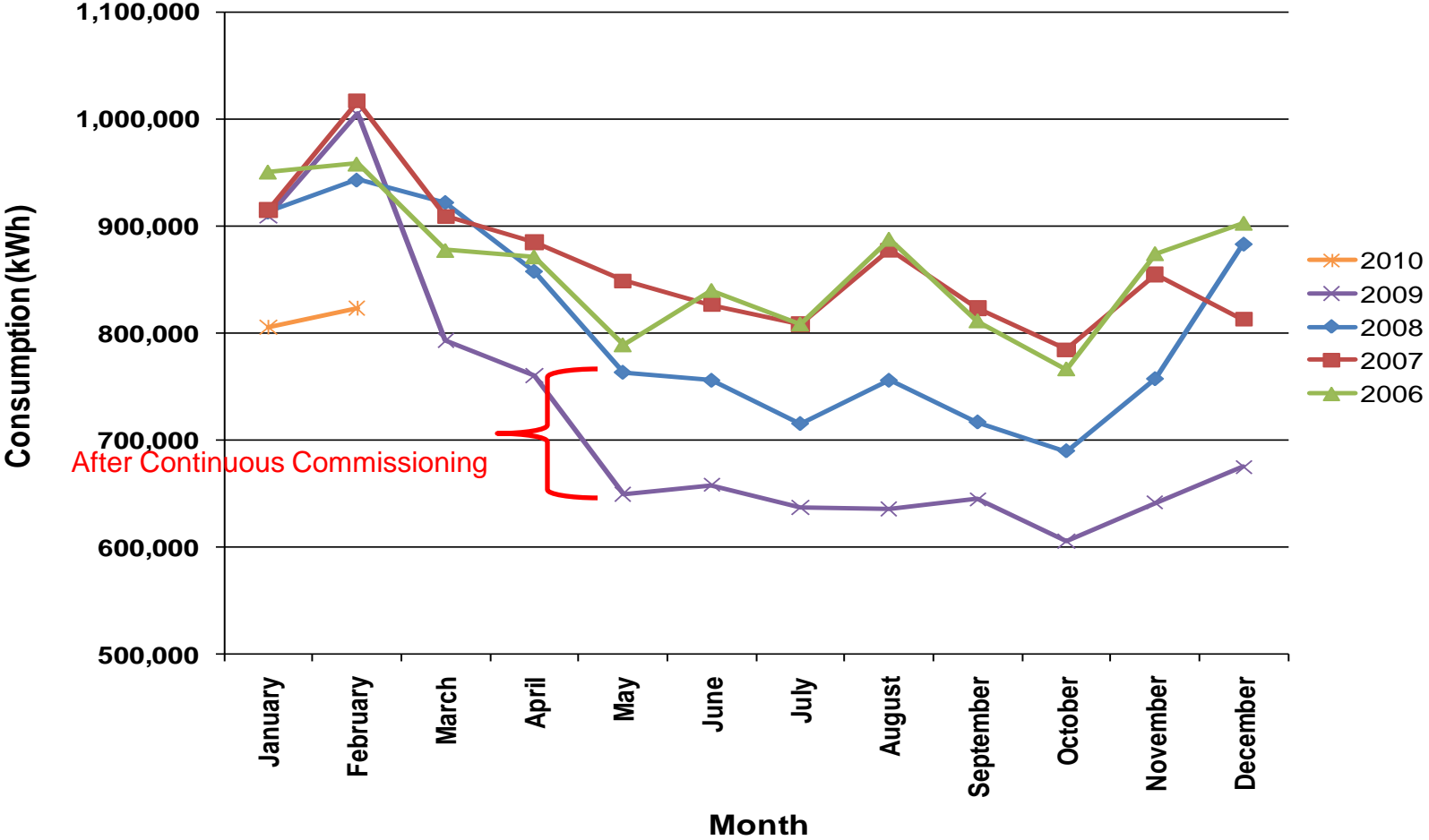
Caterpillar Confidential: GREEN

THANK YOU!



CAT Financial HQ

CAT Financial Electricity Consumption (unadjusted)



Commissioning, Re-Commissioning, Retro-Commissioning

Commissioning(Cx) – New Construction

- “per plans and specs”
 - Facilitate and verify

Re-Commissioning (RE-Cx) -- Existing Buildings

- RETURN to “per plans and specs” on an existing building previously commissioned
 - Facilitate and verify AGAIN

Retro-Commissioning (RCx) -- Existing Buildings

- RETURN to “per plans and specs” on an existing building never commissioned
 - Facilitate and verify and possibly “improve”
 - No specific implementation process



What is Continuous Commissioning ®?

An **ongoing** process to resolve operating problems, improve comfort, and optimize energy use...in accordance with the building's current operating parameters and conditions.....

...is a scientific energy efficiency process for practical optimization of the HVAC system.

... it is an end-to-end analysis (via real measurement, baseline development, comparative analysis and proprietary modeling applications) and optimization of each component connected to or affected by the HVAC system as well as a set of custom algorithms created exclusively for your existing control system(regardless of manufacturer)

Continuous Commissioning is delivered through authorized licensees of this patented process developed by Texas A&M University



Retro-Cx vs. CCx

Retro-Cx

- Basis of Design
- One time event
- Typically does not include
 - Measurement/Verification
 - Implementation
 - Official follow up
 - Official staff training

– ROI

CCx

- Optimization based on current operating conditions
- Ongoing
- Always includes
 - Measurement and Verification
 - Implementation
 - Continuous follow up
 - Structured staff training
- Sustained ROI's



LEED 2009.....

BDC – New Construction

O&M – Existing Buildings

CS – Core and Shell

CI – Commercial Interior

S – Schools, New Construction and Renovation



LEED-EB: Rating System Overview

Seven Credit Categories (110 Points)

- Sustainable Sites (26 Points) = 24%
- Water Efficiency (14 Points) = 13%
- **Energy & Atmosphere (35 Points)**
 - **32% of total for Platinum**
 - **88% of total for Certification**
- Materials & Resources (10 Points) = 9%
- Indoor Environmental Quality (15 Points) = 14%
- Innovation in Operations (6 Points) = 5%
- Regional Priority (4 Points) = 4%



Energy and Atmosphere.....

- Points-

- *Energy Efficiency*

- **Commissioning**

- **EA 2.1 – Investigation – 2 points**
 - **EA 2.2 – Implementation – 2 points**
 - **EA 2.3 -- Ongoing – 2 points**



15%

- *Building Automation System*

- *BAS controls heating, cooling, ventilation and lighting.*

- *System Level Metering-*

- *AHUs, boilers, lighting, etc*

- *Green Power- On-site, or purchase of RECs*

