United Technologies

CONNECTICUT D.E.P.

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GHG Program Manager

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United Technologies Corporation

Agenda

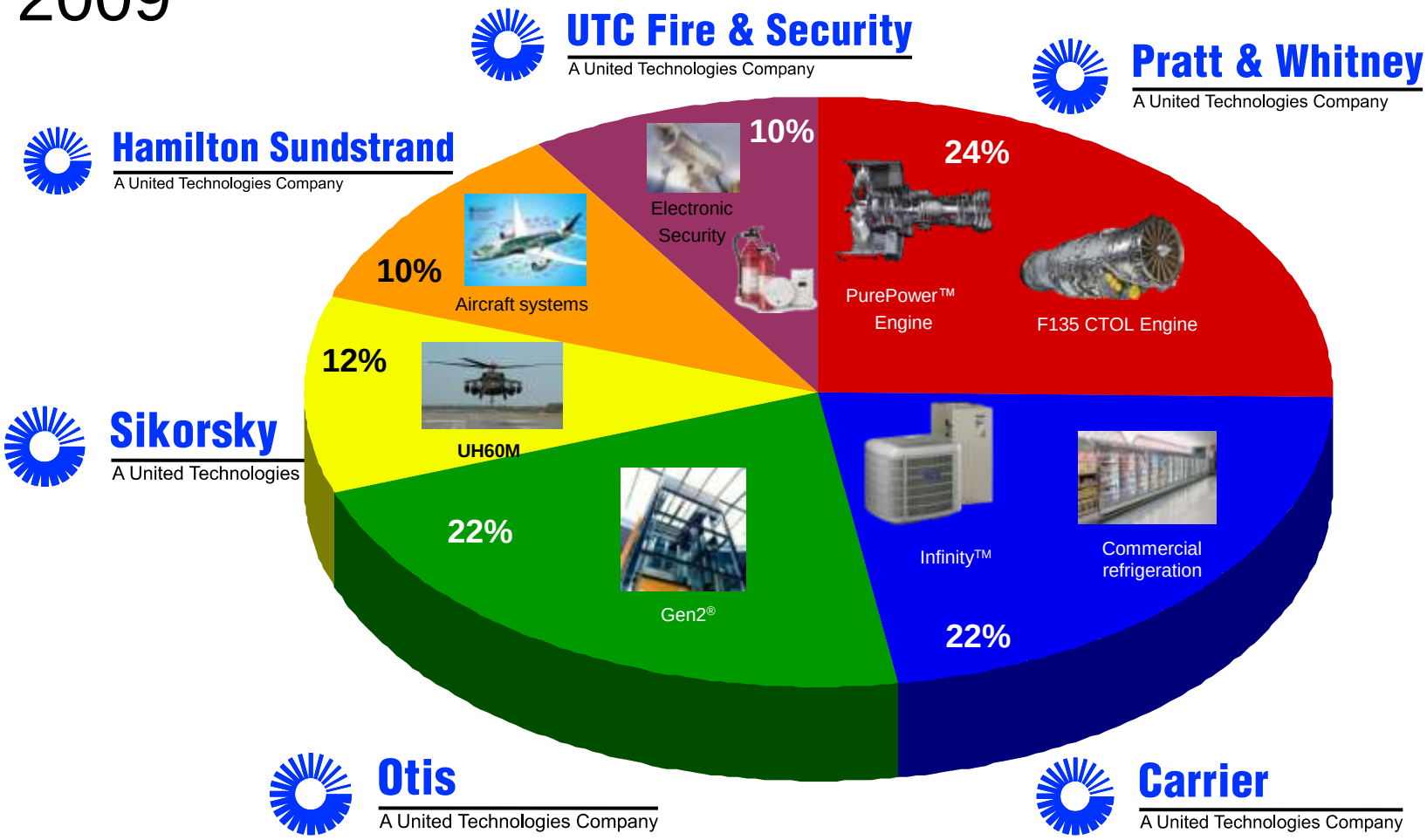
UTC at a glance

Essential Elements of Energy Management Plan

- Data Management
- Policy & Goals
- Project Identification
- Energy Management Guidebook
- Project Implementation

UTC AT A GLANCE

2009



$52.9 billion

UTC BUILDINGS PORTFOLIO

4,859 Global locations
96.7 million ft^2
61.5 MSF Owned 35.2 MSF Leased

Reporting Sites

Manufacturing sites + all sites >$100K annual energy spend

327 sites
66.7 million ft^2
1.885 million* metric tons CO2e

* Approximately 360K metric tons reported is direct process emissions, fleet and business travel.

Non-Reporting Sites

<$100K annual energy spend

4,532 sites
~30 million ft^2
286K metric tons CO2e

SUSTAINABILITY

Social, environmental and economic performance

"Sustainability is doing things efficiently to preserve resources and minimize environmental impacts. Not everyone broadens the definition to include human capital but I would…."

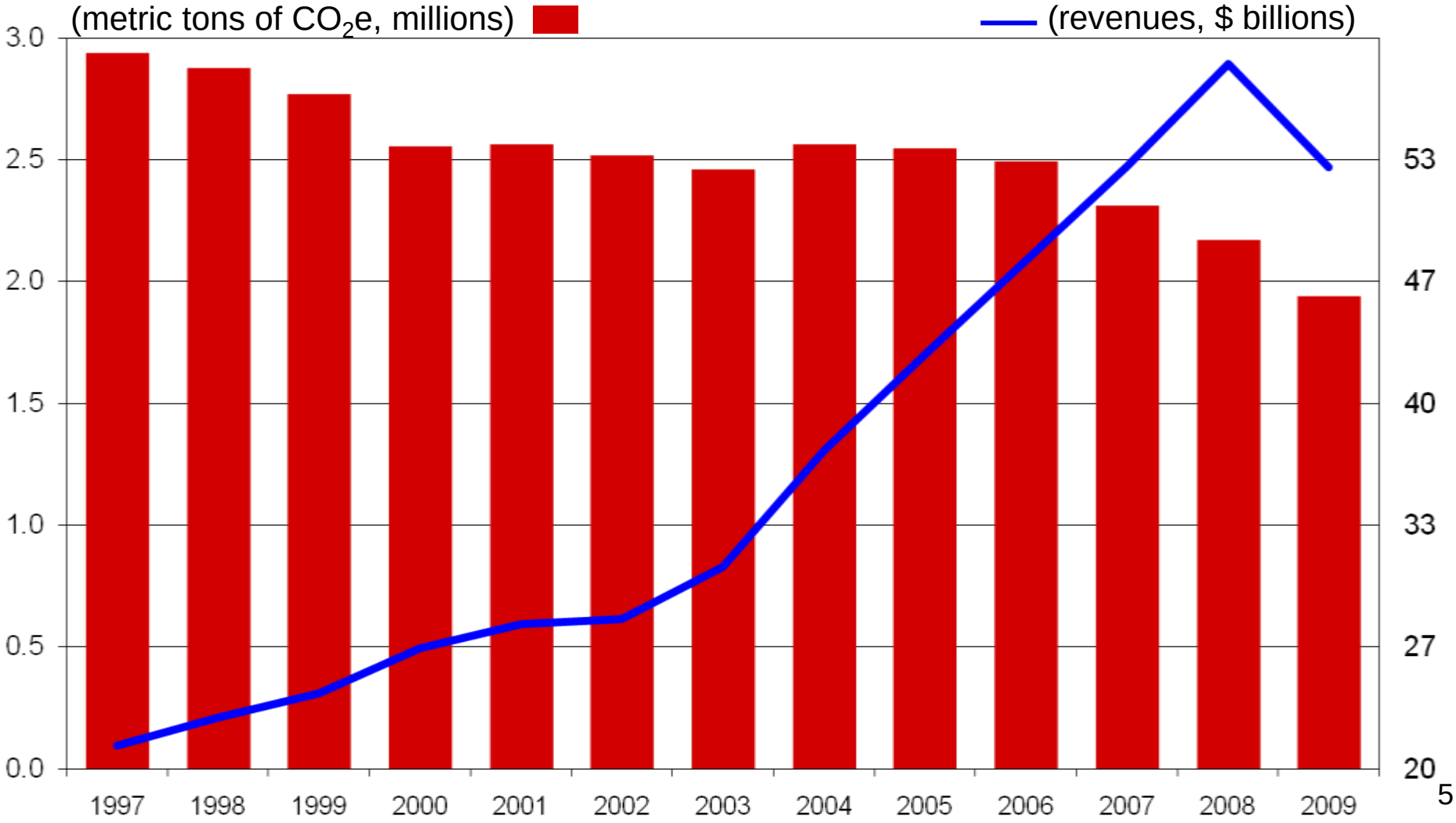
George David
UTC Chairman

Louis Chênevert,
UTC President and CEO

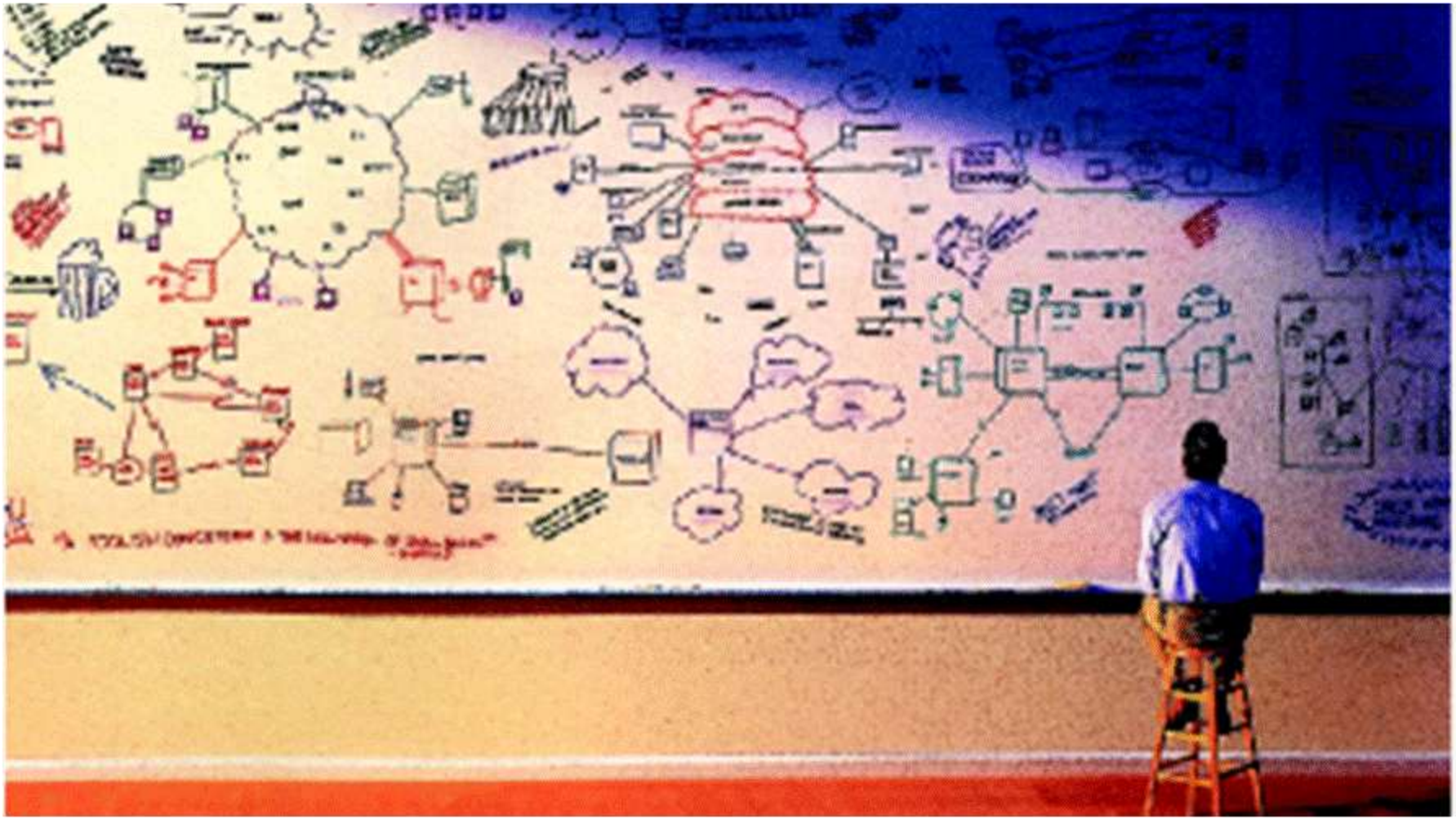
"My predecessor, George David, had a vision 15 years ago…that UTC would be an environmental leader, both in our own operations and with our products. This was not a choice between financial and environmental performance. Rather, it was a steadfast commitment to the belief that profitability and environmental responsibility go hand-in-hand."

GREENHOUSE GAS EMISSIONS

CO_2 equivalents worldwide

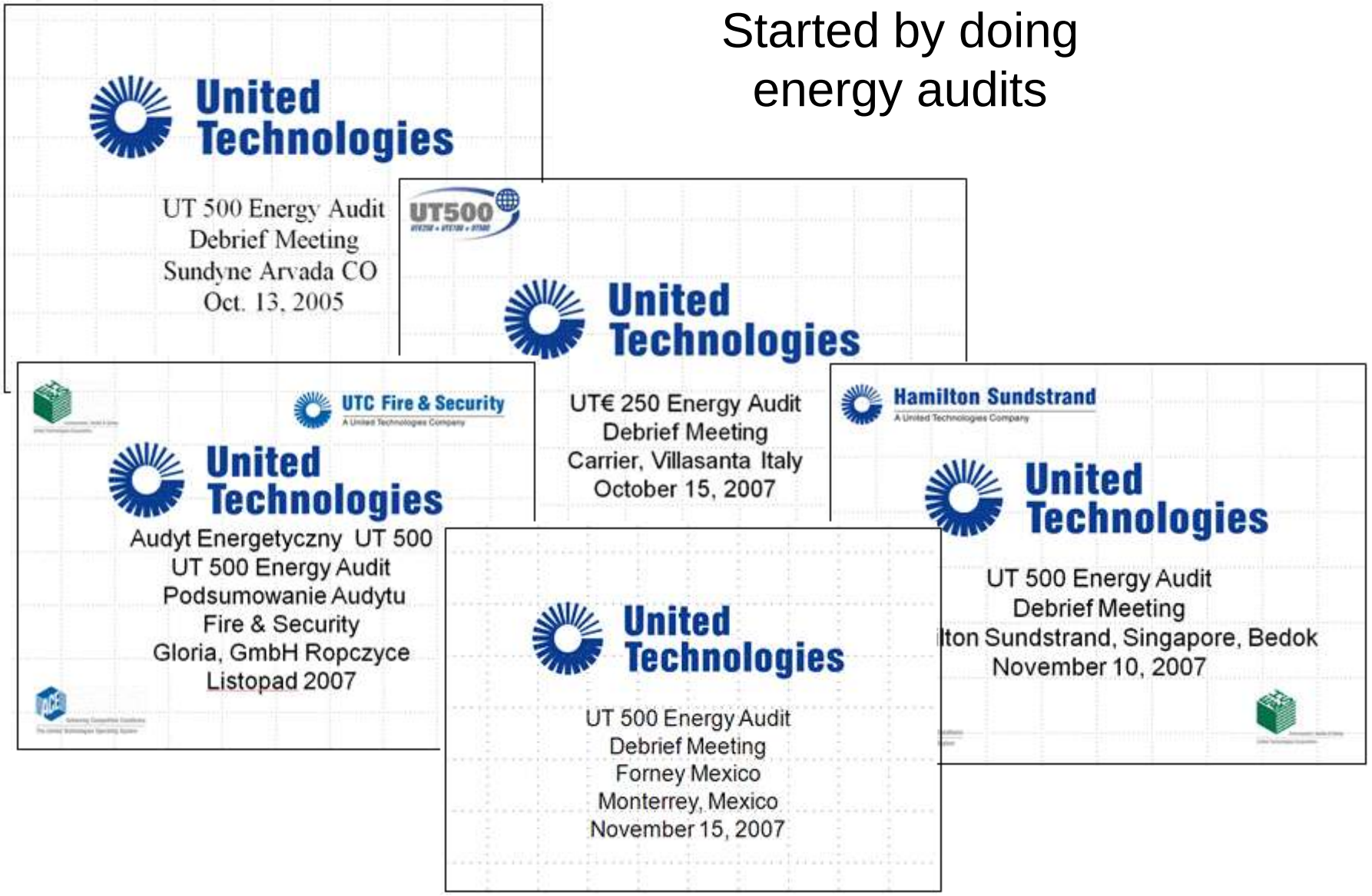


ENERGY & GHG MANAGEMENT, where do I start?



ENERGY & GHG MANAGEMENT

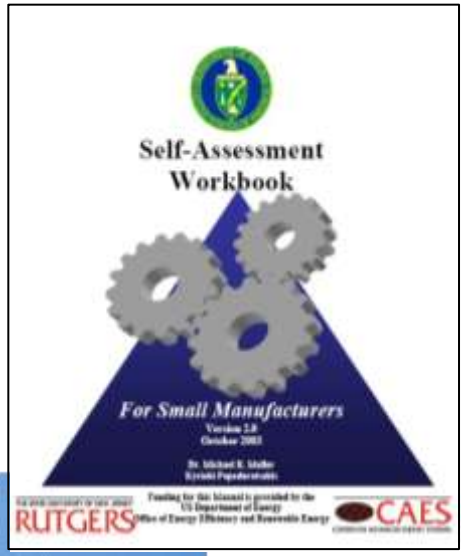
Started by doing energy audits

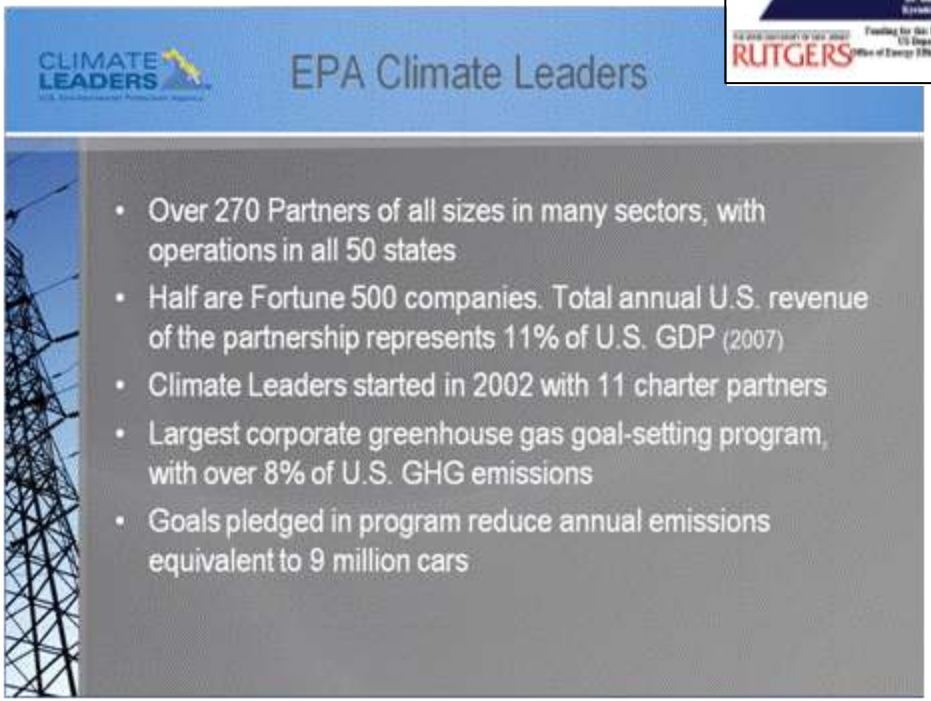


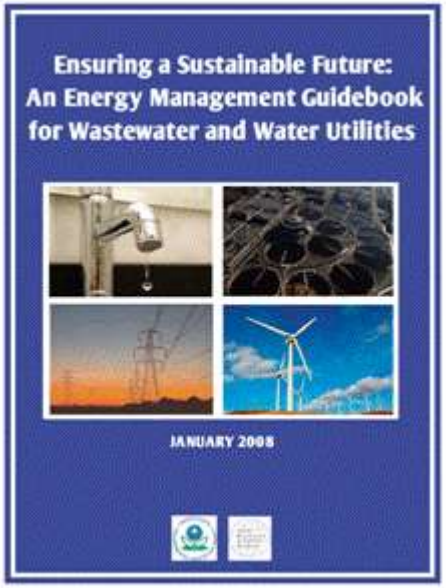
ENERGY MANAGEMENT GUIDEBOOK

Developed
"Standard Work"

Guidebook







5 ESSENTIAL ELEMENTS of GHG PROGRAM

UTC has developed a world class energy management program that works for our organization,

1. Environmental data management system
2. Established corporate policy and goals
3. Developed an in-house energy audit program (including training, awareness)
4. Developed an Energy Management Guidebook
5. Use an online project tracking system

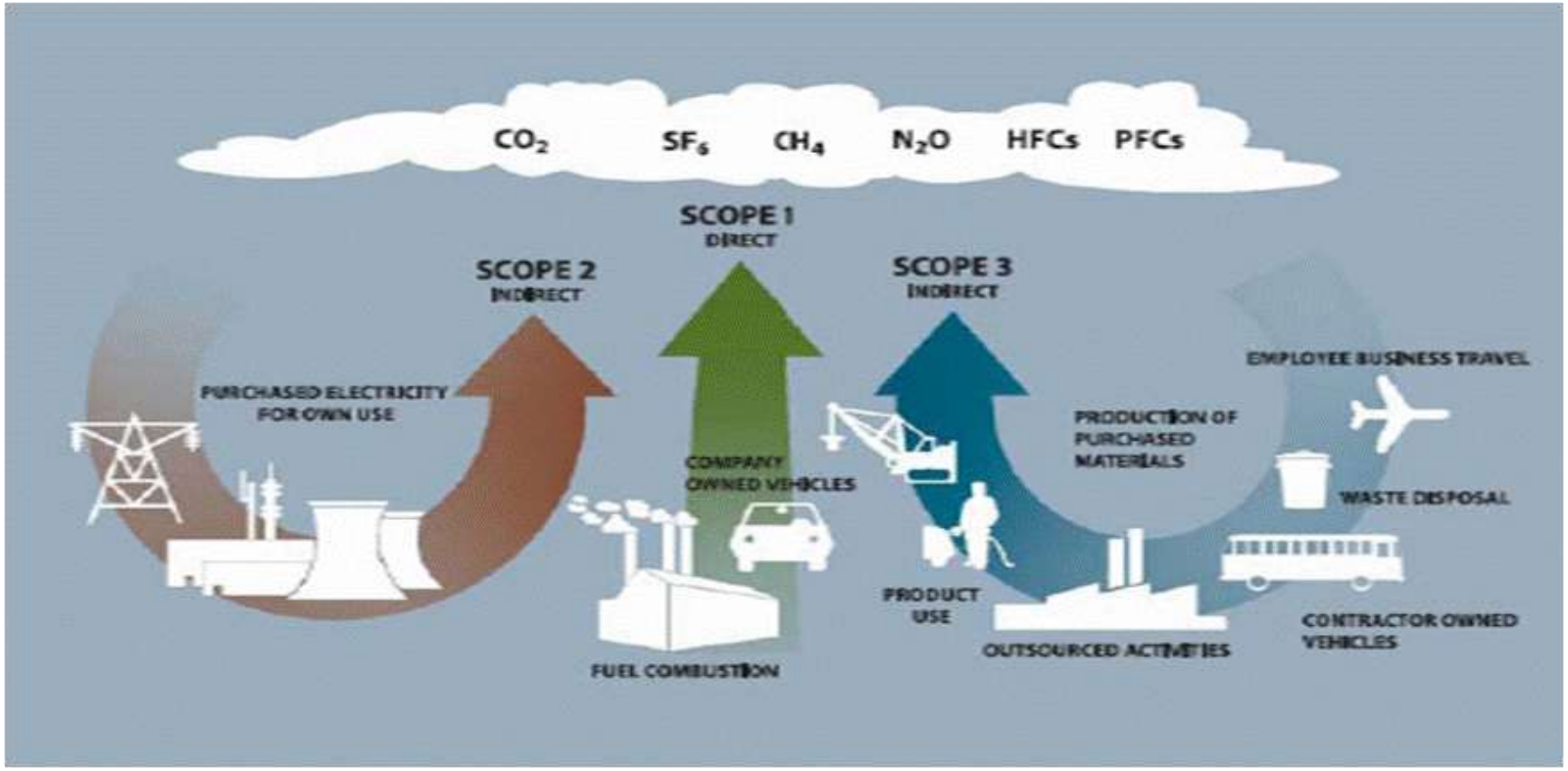
CENTRAL EH&S REPORTING SYSTEM

Step 1

GREENHOUSE GAS PROTOCOL

Step 1

- **Carbon Dioxide** (CO_2): *Emitted mainly from the burning of fossil fuels*
- **Methane** (CH_4), **Nitrous Oxide** (N_20), **Hydrofluorocarbons** (HFCs), **Perfluorocarbons** (PFCs), and **Sulphur Hexafluoride** (SF_6): *Emitted mainly from waste disposal, air conditioning and refrigeration, and specific industrial processes.*



WRI/WBCSD GHG Protocol
Corporate Accounting and Reporting Standard

ENERGY and GHG REDUCTION PLAN

EH&S Standard Practice SP-017*

"SP-017 outlines the elements necessary to manage energy and reduce GHG emissions."

"This standard applies to all UTC business units worldwide."

"The minimum expectation is that each site has a documented plan that demonstrates identification, assessment, an actionable implementation plan and completed project list."

* ANSI / MSE 2000:2005

2010 GOAL STATUS

Step 2

Environment, supplier, and product metrics

	Non-Greenhouse Gas (Air) Emissions	Greenhouse Gas Emissions (CO2-equiv.)	Total Industrial Process Waste	Non-Recycled Waste	Water Consumption	Chemicals Discharged to Water
Environment	20% ▼	12% ▼	10% ▼	30% ▼	10% ▼	10% ▼
2006 baseline	3.57 million lbs.	2.51 million metric tons	393.9 million lbs.	96.3 million lbs.	2.18 billion gallons	1339 lbs.
Absolute Reductions	-62%	-23%	-36%	-41%	-24%	-34%

	Critical Suppliers
Supplier	100% meet UTC EH&S expectations
2009 Performance	1124 Key suppliers meeting goal (100%)

	Packaging	Energy Efficiency	Materials of Concern
Product	10% ▼ in product packaging	10% ▲ from baseline product	100% eliminated in new products
2009 Performance	77% meeting goal	73% meeting goal	51% MOC elimination

GHG Mgt. TRAINING AND AUDITS

Step 3

Training: over 200 employees trained worldwide

2006 Energy Workshops held in Charlotte and Paris

2007 Energy Workshops held in Atlantic City, Villasanta (Italy), and Singapore

Audits of *Top 60* sites worldwide

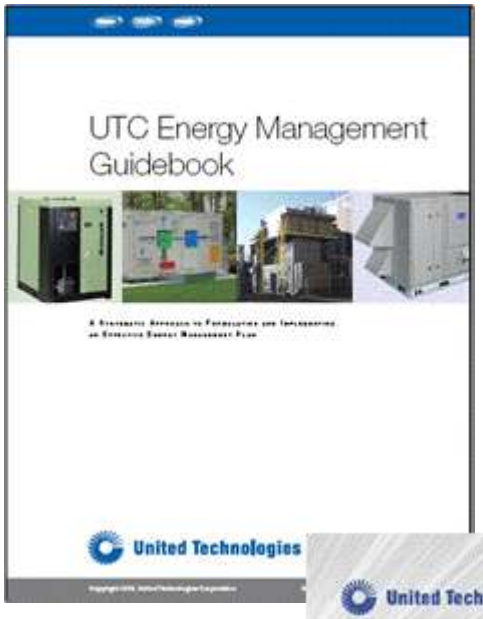
ECM	Project < 2 year Payback	Investment	$ Savings	kWh or MMBTU Savings	CO_2e Reduction	Payback
1	Exhaust fan controls- Firewire & welding	$600	$16,000	100,000	47	0.04
2	Shut it off	$0	$6,900	43,125	20	0.00
3	Energy efficienr motors	$2,390	$3,859	24,000	11	0.62
3a	Selective ixture removal in office area	$3,200	$6,500	40,625	19	0.49
4a	Office lighting- remove lamps	$12,000	$16,000	100,000	47	0.75
4b	Wire office lights for "dual level" control	$24,000	$16,000	100,000	47	1.50
5	Replace shop HSP S light fixtures	$20,000	$10,000	62,500	30	2.00
6	Install HVAC controls for shut off	$40,000	$71,000	443,750	209	0.56
7	Install "zero loss drains" on air system	$400	$540	3,375	2	0.74
8	Convert lab AHU to gas heating	$14,000	$19,000		42	0.74
9	Combine compressed air systems	$12,000	$12,000	75,000	35	1.00
10	Conduct air leak audit, repair program	$2,700	$2,700	16,875	8	1.00
11	Upgrade hot water system	$40,000	$33,000	206,250	97	1.21
	Total < 2 Years	**135,290**	**181,499**	**1,015,500**	**521**	**0.75**
ECM	**Project > 2 Year Payback**	**Investment**	**$ Savings**	**kWh Savings**	**CO_2e Reduction**	**Payback**
12		$2,000	$700	4,375	2	2.86
	Total > 2 Years	**$2,000**	**700**	**4,375**	**2**	
	Total	**$ 137,290**	**$ 182,199**	**1,019,875**	**523**	
ECM	**Requires Further Investigation**	**Investment**	**$ Savings**	**kWh Savings**	**CO_2e Reduction**	**Payback**
13	Destratification fans	TBD	TBD	TBD	TBD	TBD
14	Detail study of HVACsystems	TBD	TBD	TBD	TBD	TBD
15	Sub-meter tenant data center	TBD	TBD	TBD	TBD	TBD

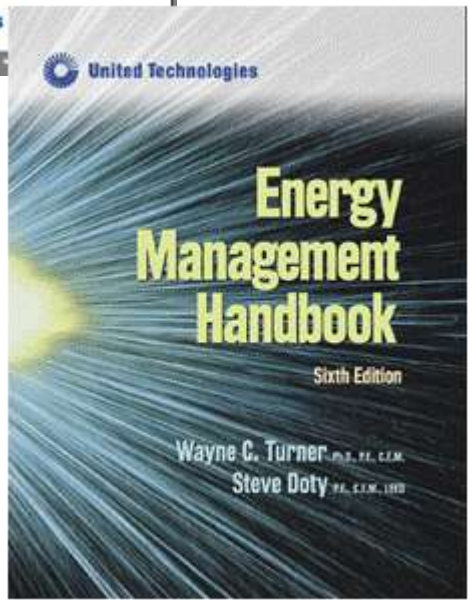
Financially sound investment and CO2 reductions

ENERGY MANAGEMENT GUIDEBOOK

UTC Energy Team - Tools

- Energy Team Guidebook
- Energy Management Handbook
- Sullair Compressed Air Guidelines
- UTC Lighting Guidelines
- Workshops
- Audits
- Self Assessment Tools
- Standard Work Documents
  - Steam Trap Maintenance
  - Shut it Off
  - Compressed Air Leak Management
  - Rate Management





UTC ENERGY MANAGEMENT GUIDEBOOK

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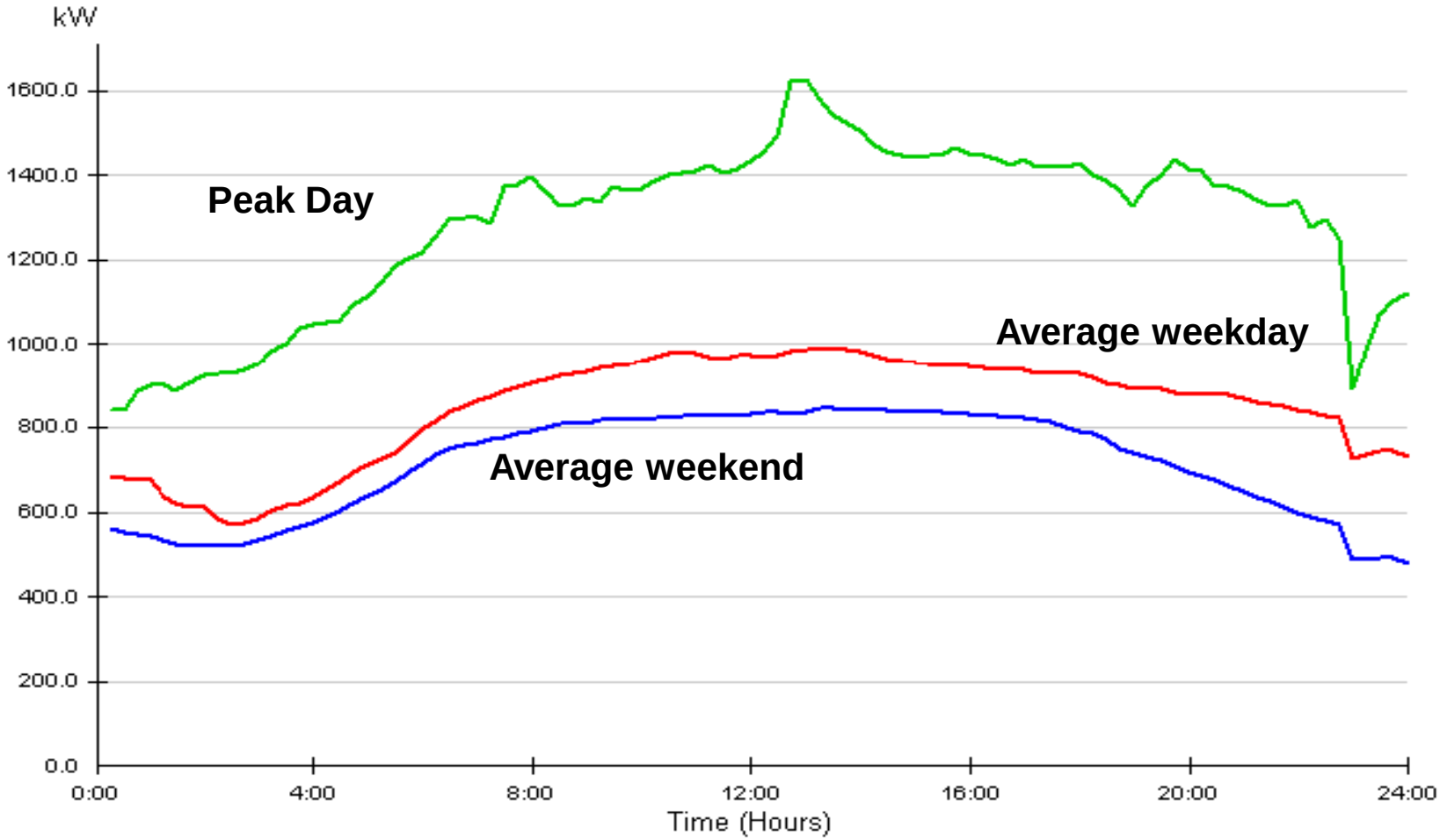
Low Cost – No Cost

UT500 ENERGY TEAM

1. Energy Data Management

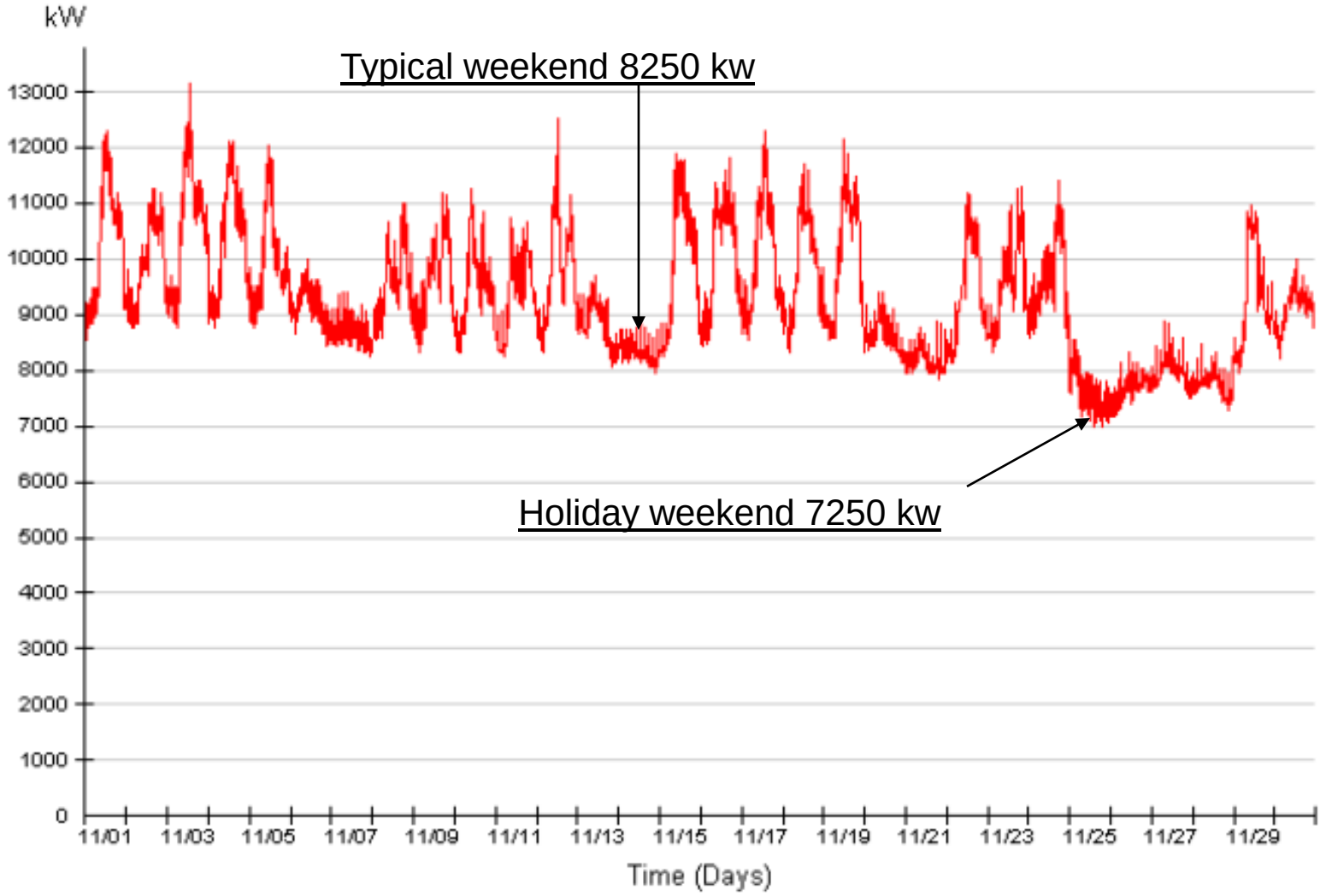
Daily Electric Profile



Calculate Load Factor

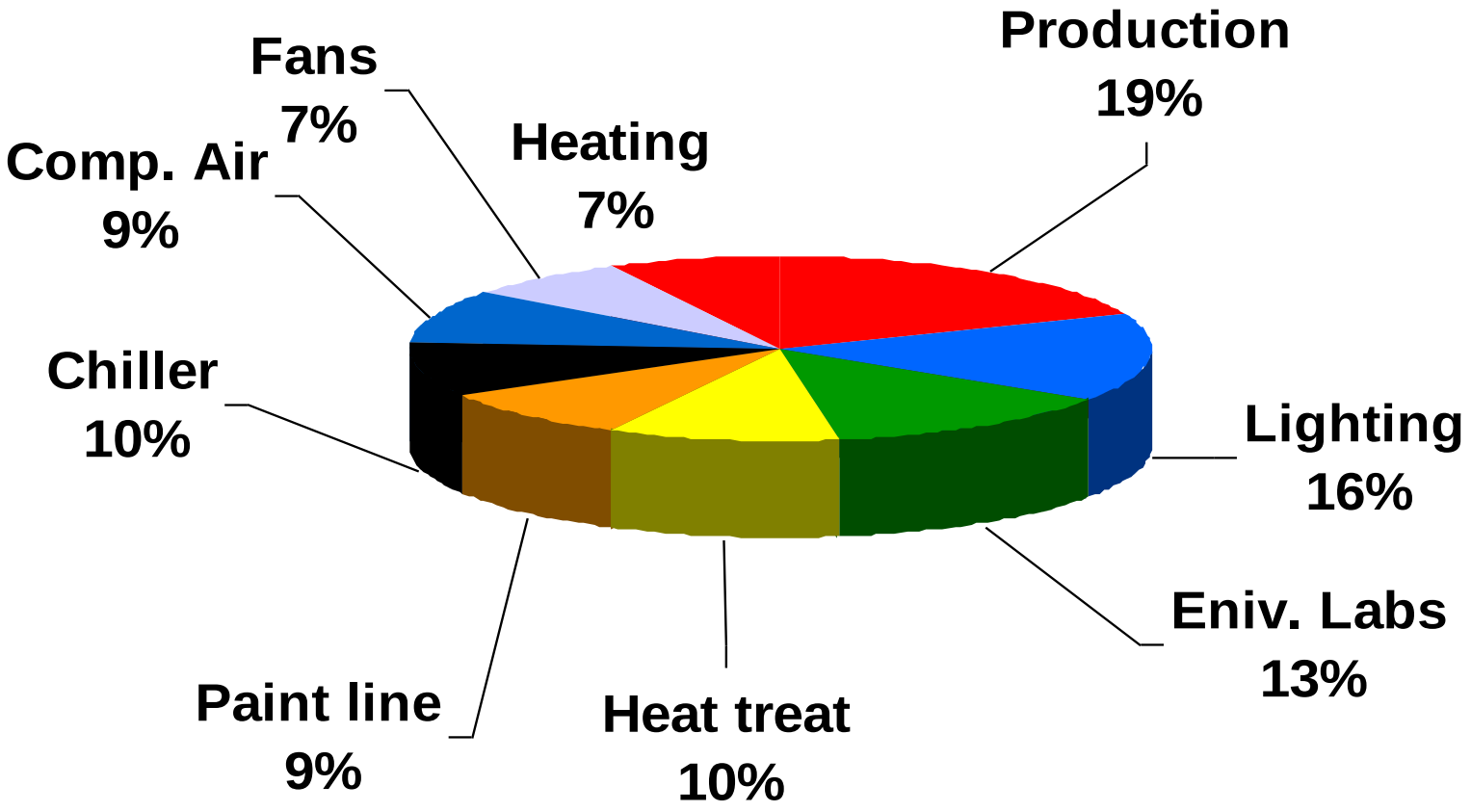
UT500 ENERGY TEAM

5. Shut-it-Off program



UT500 ENERGY TEAM

3. Load Management



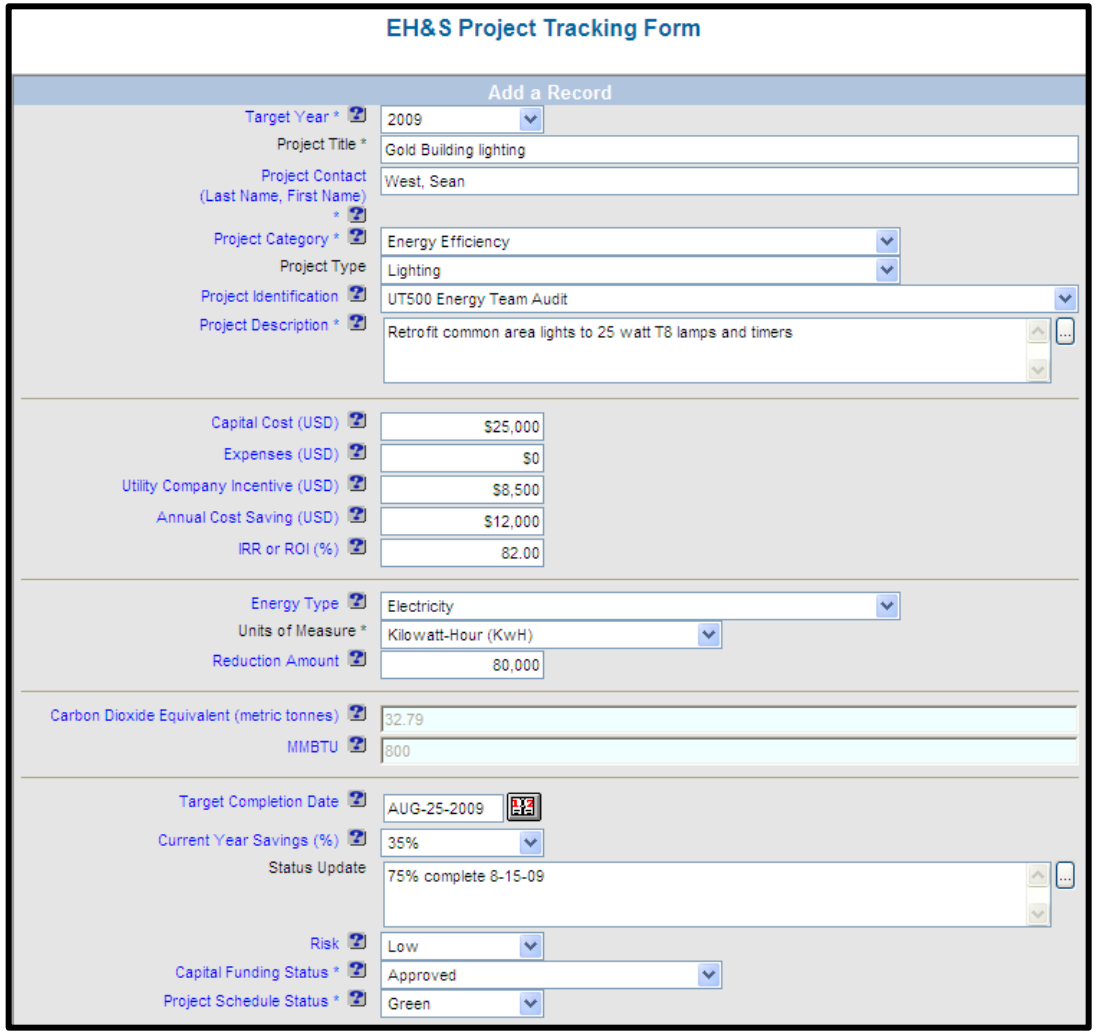
Identify top energy users

Web based EH&S reporting system

Step 5

GHG DATA COLLECTION

Project Tracking

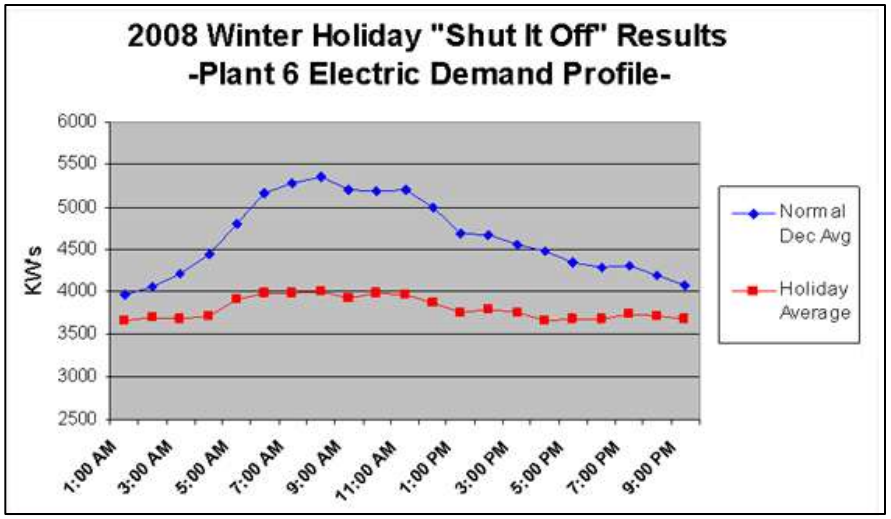


EH&S Project Tracking Form

Add a Record

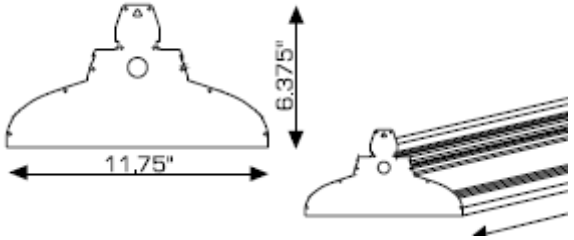
Target Year *	2009
Project Title *	Gold Building lighting
Project Contact (Last Name, First Name) *	West, Sean
Project Category *	Energy Efficiency
Project Type	Lighting
Project Identification	UT500 Energy Team Audit
Project Description *	Retrofit common area lights to 25 watt T8 lamps and timers
Capital Cost (USD)	$25,000
Expenses (USD)	$0
Utility Company Incentive (USD)	$8,500
Annual Cost Saving (USD)	$12,000
IRR or ROI (%)	82.00
Energy Type	Electricity
Units of Measure *	Kilowatt-Hour (KwH)
Reduction Amount	80,000
Carbon Dioxide Equivalent (metric tonnes)	32.79
MMBTU	800
Target Completion Date	AUG-25-2009
Current Year Savings (%)	35%
Status Update	75% complete 8-15-09
Risk	Low
Capital Funding Status *	Approved
Project Schedule Status *	Green

EXAMPLE PROJECTS



PW LIGHTING PROJECT

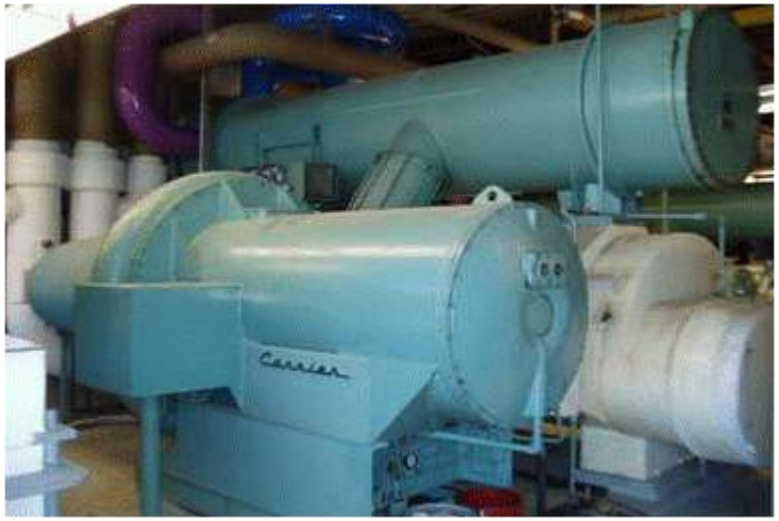
Light levels Up – Costs Down



Typical Lighting Fixtures

- Lighting projects approved for 2 PW facilities
- GHG reduction ~ 9,000 metric tons (12%)
- Buildings – L, J, K in EH, Building 150, 220 and 220M in Middletown

HS CHILLER REPLACEMENT



Original Chiller

1100 ton, 1967 vintage Carrier unit

Consumption

2,000,000 KWH

Emission

1128 MT CO2e

Replacement

800 ton, energy efficient Carrier, w/VFD

Consumption

800,000 KWH

Emission

451 MT CO2e

Energy and GHG Reductions

1,200,000 KWH

677 Metric Tons CO2e

3 year payback

Sustainability - Factories

Step 5

Shanghai Engine Center – LEED Platinum

Power Systems Headquarters – LEED Silver

Turkish Engine Center – LEED Gold

Middletown Engine Center – Cogeneration

FIVE ESSENTIAL ELEMENTS of GHG PROGRAM

Summary, must do all five

1. Environmental data management system
2. Established corporate policy and goals
3. Developed an in-house cross-divisional Energy Team (audits, provide training, build awareness)
4. Developed an Energy Management Guidebook
5. Use an online project tracking system

Q&A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United Technologies Corporation