

Industry Week - Best Plants Conference

Energy Efficiency as a Competitive Advantage



Presenters

Clay Nesler

Vice President, Global Energy and Sustainability

Kevin Shelton

Vice President, Manufacturing Facility Services

2



Corporate Overview



- Founded in 1885
- \$34.2 billion company
- 140,000 employees worldwide
- 61 consecutive years of increasing sales
- 32 consecutive years of dividend increases
- Dividends paid consecutively since 1887

3



Three Global Businesses



Automotive Experience (\$18.3 billion)

Seating and interiors
Components and system integration
Electronics



Power Solutions (\$3.7 billion)

Lead acid (80 million per year)
Hybrid battery development (NiMH, Li-Ion)
Battery management and electronics



Building Efficiency (\$12.2 billion)

Systems and equipment
Life-cycle services (500 locations in 125 countries)
Energy efficiency

4



Energy and Sustainability in the Headlines

CNN APEC outlines action on climate

- Story highlights
- Tentative agreement on need "to slow, stop, reverse" climate change reached
- Thousands protest outside town hall against Iraq war and global warming
- South Korea's Roh presses Bush to be "clearer" on Korean War stance

THE WALL STREET JOURNAL SEC Pressed on Climate-Change Disclosures

Nearly two dozen state officials, big investors and others plan to prod the Securities and Exchange Commission to require more rigorous analysis and disclosure of the risks posed by climate change.

The New York Times

Pacific Rim Nations Adopt Nonbinding Emissions Targets

September 10, 2007, Monday - The Asia-Pacific Economic Cooperation meeting here limped to a close on Sunday, with a nervy compromised agreement on tackling climate change and few answers on how to advance the global trade agenda.

THE WALL STREET JOURNAL

September 18, 2007

PAGE ONE

The Right to Dry: A Green Movement Is Rolling America

Chalk-line Has Neighbors Beat Out of Shape in Bend; An Illegal Solar Device?

THE WALL STREET JOURNAL

EU to Propose Energy Overhaul

BRUSSELS - European Union officials will propose legislation Wednesday that aims to break open the bloc's energy market, making it more competitive and less dominated by national monopolies.

The Japan Times

EXCESS GREENHOUSE GASES

Japan on pace to miss '10 emissions target by 34 million tons

Japan, if it continues at its present pace, needs to reduce its greenhouse gas emissions by an additional 20 million to 34 million tons to attain the 2010 goal under the Kyoto Protocol to curb global warming, according to an interim report released Friday by government ministries.

CNN Have we reached the energy tipping point?

STORY HIGHLIGHTS

- Poll shows energy is Americans' fourth most-important priority for Washington
- Presidential candidates tout "Apollo program" for energy and environment
- State, local efforts signal possible shift toward renewables, conservation

CHINA Daily

Renewable energy to be a priority for nation

China plans to put even greater effort into developing its renewable energy industry and cut greenhouse gas emissions to maintain sustainable economic growth in the coming years.

TIMES ONLINE

Booming economy makes Spain worst EU offender in fight to cut levels of CO

Greenhouse gas emissions are rising in more than half the countries of the EU, according to official figures yesterday that threaten to undermine its call for the rest of the world to join a new climate-change treaty.



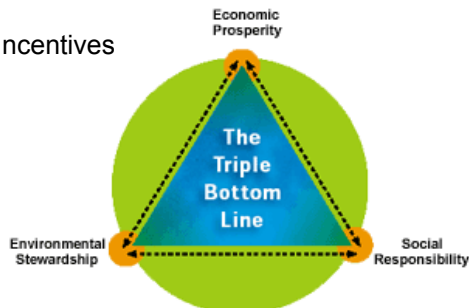
Energy and Sustainability Market Drivers

Focus on Energy Efficiency and Clean Energy

- Increasing Energy Prices
- Energy Independence
- Climate Change Concerns
- Legislation, Regulation and Incentives
- Green Movement

Triple Bottom Line

- Economic Prosperity
- Environmental Stewardship
- Social Responsibility



6



Energy Efficiency Indicator Survey

On-line survey conducted in March 2007

228 manufacturing executives and managers responsible for energy management decisions

Major findings:

- 77% believe energy prices will rise significantly next year (average increase expected is 15.4%)
- 66% expect to make energy efficiency investments over the next year (9% of capital budget will be used)
- 75% will also fund energy efficiency improvements through operating budgets

7



Energy Efficiency Indicator Survey

Major findings (continued):

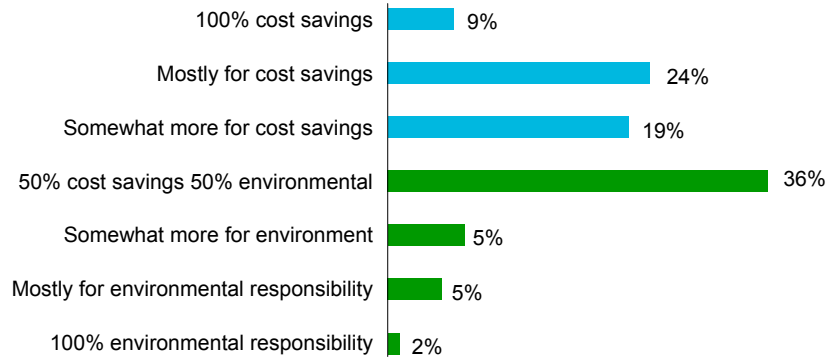
- 55% feel that energy efficiency is very or extremely important to their organization
- 69% are paying more attention to energy efficiency than they were one year ago.
- 44% will accept paybacks greater than three years (another 41% will allow 2-3 year paybacks)
- 22% allow longer paybacks than five years ago (only 9% allowed longer paybacks five years ago)

8



Motivation for Energy Investments

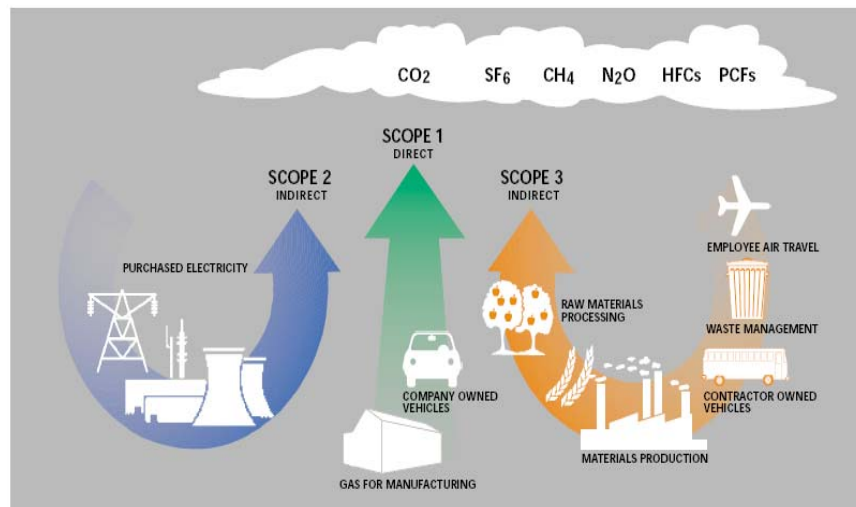
48% of participants feel that environmental responsibility is at least as strong a motivator as cost savings



9



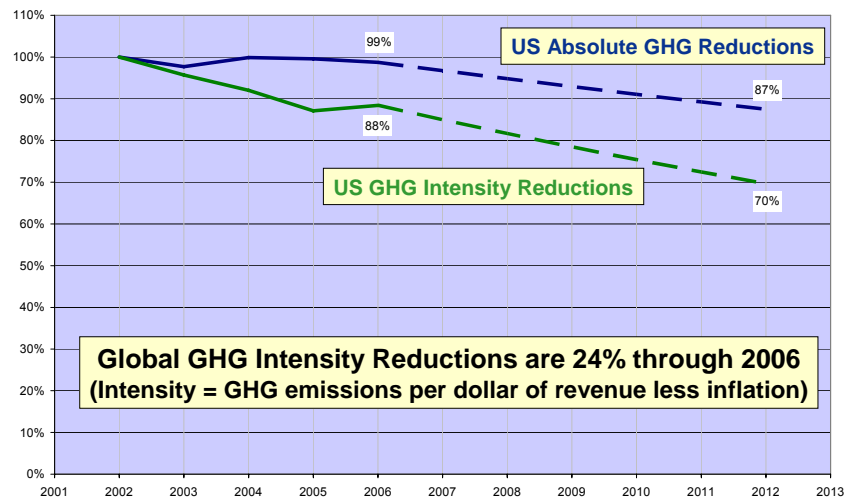
GHG Sources



10



US GHG Emissions Projection (2002 – 2012)



11



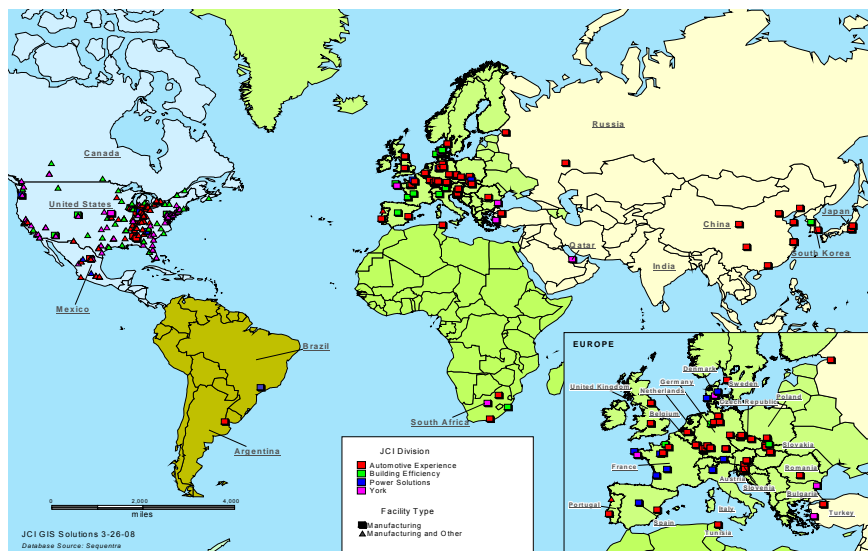
Johnson Controls Sustainability Goals

- We have publicly committed to a 30% GHG intensity reduction in the US from 2002 to 2012 (baseline confirmed by EPA Climate Leaders) and globally as a component of our ten-year sustainability marker.
- Each business establishes specific plans to achieve 3% annual GHG intensity reductions through a combination of absolute reductions (at least 1%) and revenue increases beyond inflation.
- Other environmental strategies
 - Development of environmentally-responsible products & services
 - Improving the eco-efficiency of our supply chain

12



Johnson Controls Manufacturing Footprint



13



Making it Happen - Energy Efficiency Best Practices

- Make a commitment
- Baseline current performance with data
- Set tangible goals
- Develop a plan
- Execute the plan
- Measure the results
- Recognize achievement

14



Commitment to Energy Management

Johnson Controls established a Corporate Energy Team to facilitate and implement the energy program

- JCI is a diversified global manufacturer therefore team members include Facilities, Sustainability, Purchasing, Finance, Continuous Improvement and Plant Operations

Our Energy Policy – We will continuously lower our energy cost and improve our energy efficiency in support of our vision.

“A more comfortable, safe and sustainable world.”

15



Johnson Controls Energy Portfolio

2007 Data:

- \$223,000,000 Global energy spend
- 2,184,077,377 kWh Global electricity usage
- 41,453,482 therms Global natural gas usage

16



Energy management leads to sustainable savings

Rate
0-5%



Efficiency
5-25%

Utilization
1-10%

17



Programmatic Approach to Energy Management

Strategy	Strategic Energy Planning				
Management	Program Management				
Tactics	Supply-Side Management	Demand-Side Management	Utility Bill Management	Energy Information	Regulatory Compliance
Capabilities	<ul style="list-style-type: none"> Strategy & Planning Risk Management Rate Analysis Procurement Support Contract Negotiation Market Intelligence 	<ul style="list-style-type: none"> Reliability Enhancements Project Development Project Management Capital Planning Operational Efficiency Performance Tracking Asset Financing 	<ul style="list-style-type: none"> Invoice Processing Bill Payment Historical Cost Tracking Invoice Validation Recovery Of Incorrect Charges 	<ul style="list-style-type: none"> Performance Monitoring And Data Collection Data Analytics Problem Identification 	<ul style="list-style-type: none"> Regulatory Tracking Sustainability Reporting Energy Star Certifications

18



Energy Measurement

- Plant level – Measure energy cost and consumption per equivalent unit produced
- Business Unit Level – Compare similar plants' performances to determine opportunities
- Corporate Level – Report overall performance as a metric using revenue to account for internal growth
- What does this do?
 - Provides local focus to sustain
 - Enables BBP Analysis
 - Provides benchmark data

19



Typical Energy Improvement Projects



Compressed Air Systems



Steam Systems



Lighting



Motors and VSD's



Waste Heat Recovery



HVAC & Refrigeration

20



Implementation Process

1. Plant Audit/ Survey
2. Developed Application
3. Technology Analysis
4. Cost Reduction - Energy, Maintenance, Incentive
5. GHG Impact
6. ROI calculated
7. Project Impact by Site/ Enterprise (increases scale)
8. Gain Preliminary Approval

21



Implementation Process

9. Select Pilot Site (s)
10. Obtain Approval Funding
11. Establish Baseline (A Is Status)
12. Implement Project
13. Measure Results

22



Implementation Process

14. Project Enterprise Wide Results
(Based upon actual cost & savings from Pilot Study)
15. Prepare Capital Appropriation Request
16. Obtain Approval for Implementation
17. Document Results
18. Recognize Results

23



Organization Support

- Corporate Energy Office
- Corporate Real Estate/Facilities
- Six-Sigma Organization
- Continuous Improvement Organization
- Lean Manufacturing Team
- Best Business Practice Organization
- Outside Resources:
 - Energy Service Companies
 - Consulting Engineers
 - Performance Contracting Firms

24



Obtaining Funding

- One project at a time
- Location submits request for funds (Based on ROI)
- Division wide funding request
- Based on ROI and Corporate Responsibility
- Corporate goal Set for Cost/GHG Reduction:
 - Reductions offset increase due to investment
 - Funds Allocated at CEO and CFO level
 - ROI criteria defined
 - Supports sustainability reporting

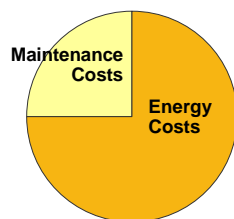
25



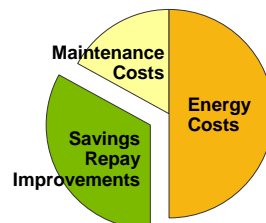
Alternative to Capital

Performance Contract: Energy/Water/Operational savings pays for long-term sustainability investment

Annual Budget
BEFORE Improvements



Annual Budget
AFTER Improvements



26



Case Studies



Lighting Retrofit Project

Retrofit of existing metal halide lighting with T-5 fluorescent in manufacturing facilities

Completed Projects (others pending)

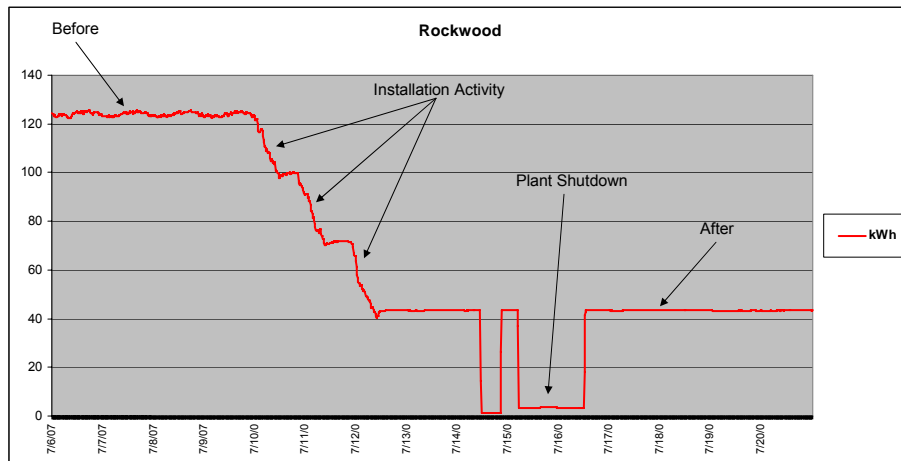
<i>Business Unit</i>	<i>Capital Req</i>	<i>Ann Savings</i>	<i>Tons CO2</i>
<i>AE</i>	<i>\$2,449,421</i>	<i>\$1,312,903</i>	<i>10,108</i>
<i>BE</i>	<i>\$1,965,956</i>	<i>\$1,239,998</i>	<i>7,852</i>
<i>PS</i>	<i>\$1,755,838</i>	<i>\$710,469</i>	<i>5,075</i>
	<i>\$6,171,215</i>	<i>\$3,263,370</i>	<i>23,035</i>

Simple payback

1.89 years



Rockwood Data Logger (Before and After Data Track)



29



Rockwood Direct Readings and Savings

Total energy consumption by group in amps @ 277V	Tot. 1-37 Before	Tot. 1-37 After	Tot. 38-74 Before	Tot. 38-74 After	Tot. 75-111 Before	Tot. 75-111 After
	150.07	43.89	149.84	48.94	148.79	48.94

TOTALS	Before	After	Difference
Total Amp's	599.73	178.75	420.98
Voltage	277	277	
kW	166.13	49.51	116.61

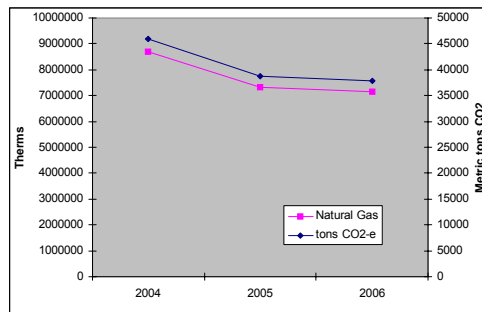
Rockwood Summary	CAR Estimate	Actual
Basis Hours	7488	7488
Electric cost per kWh	\$0.07220	\$0.07220
Projected kW Savings	85.69	116.61
Projected Dollar savings at basis	\$46,328	\$63,043
Energy savings as a percentage	52%	70%
Project Cost	\$107,094	\$107,094
Payback period (yrs.)	2.31	1.70

30



PowerFrame™ Innovation

In 2004, Johnson Controls changed its manufacturing process to make battery grids. The process improvement greatly reduced natural gas consumption.



18% reduction in GHGs

31



Power Conditioning Supply Optimization

- Corrects Power factor
- Improves Electrical Efficiency

Power Conditioning Pilot Project				
	Project Cost Estimate	Payback	Savings Estimate	GHG Reduction
Plant 1	\$274,409	2.54	\$107,870	640.2
Plant 2	\$146,003	3.10	\$47,096	209.5
Plant 3	\$76,083	2.12	\$35,822	155.1
Plant 4	\$75,071	2.14	\$35,137	153.9
Plant 5	\$86,945	1.88	\$46,185	165.4
Plant 6	\$132,219	2.57	\$51,434	219.5
Total	\$790,730	2.44	\$323,544	1,544

32



Biomass Project at Denmark Holme factory

- The factory needed to replace its 40-year-old boilers because of their age, declining performance, and the high cost of heavy fuel oil
- The CO₂ neutral biomass boiler uses wet biomass waste from local Danish Forests and is managed in a sustainable way
- The total energy expenditure per year will be reduced by 60%, which will yield a simple payback of approximately 3.5 years and a CO₂ reduction of 1,120 tons/year.
- The overall investment of 13M DKK (over \$2.5 million USD) will yield a simple payback in approximately 3.5 years.



33



What's Next?

- Compressed Air Optimization
- Injection Molding Operation
- HVAC Optimization
- LED Lighting
- TIO Program
- LEED audits for existing buildings
- Others as identified

34



Johnson Controls Recognition for Achievement

- Departmental Recognition – Quarterly
- Merit Award – Regional Business Unit Quarterly Recognition Program
- Chairman's Award – Corporate Annual Recognition



35



Key Factors for Achieving Competitive Advantage

- Make a leadership commitment to sustainability
- Take a programmatic approach to energy efficiency
- Integrate energy efficiency with established initiatives
- Review and approve programs at an executive level
- Recognize accomplishments
- Share your successes

36



Sustaining Competitive Advantage

Johnson Controls' sustainability performance has been recognized by several of the most respected corporate social responsibility and sustainability investment indexes, including:

- DJSI World
- DJSI North America
- FTSE4Good
- Domini 400 Social Index
- KLD Dividend Achievers
- KLD Global Climate 100
- KLD Broad Market Social Index
- KLD Large Cap Social Index
- KLD Select Social Index

