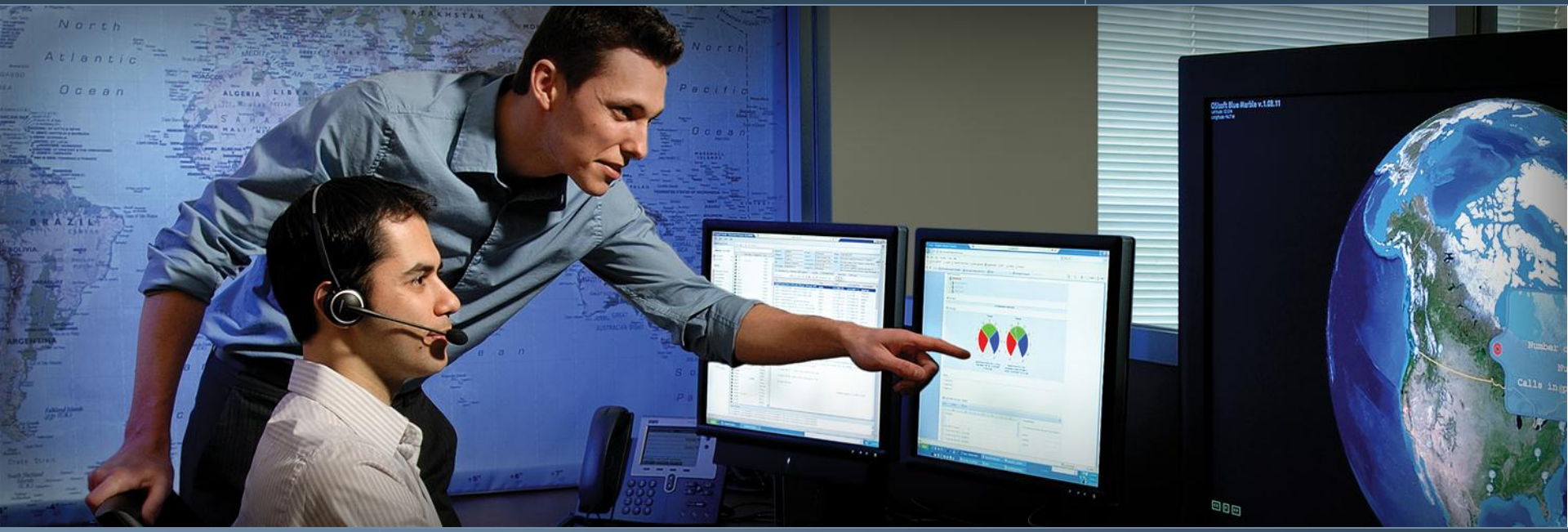


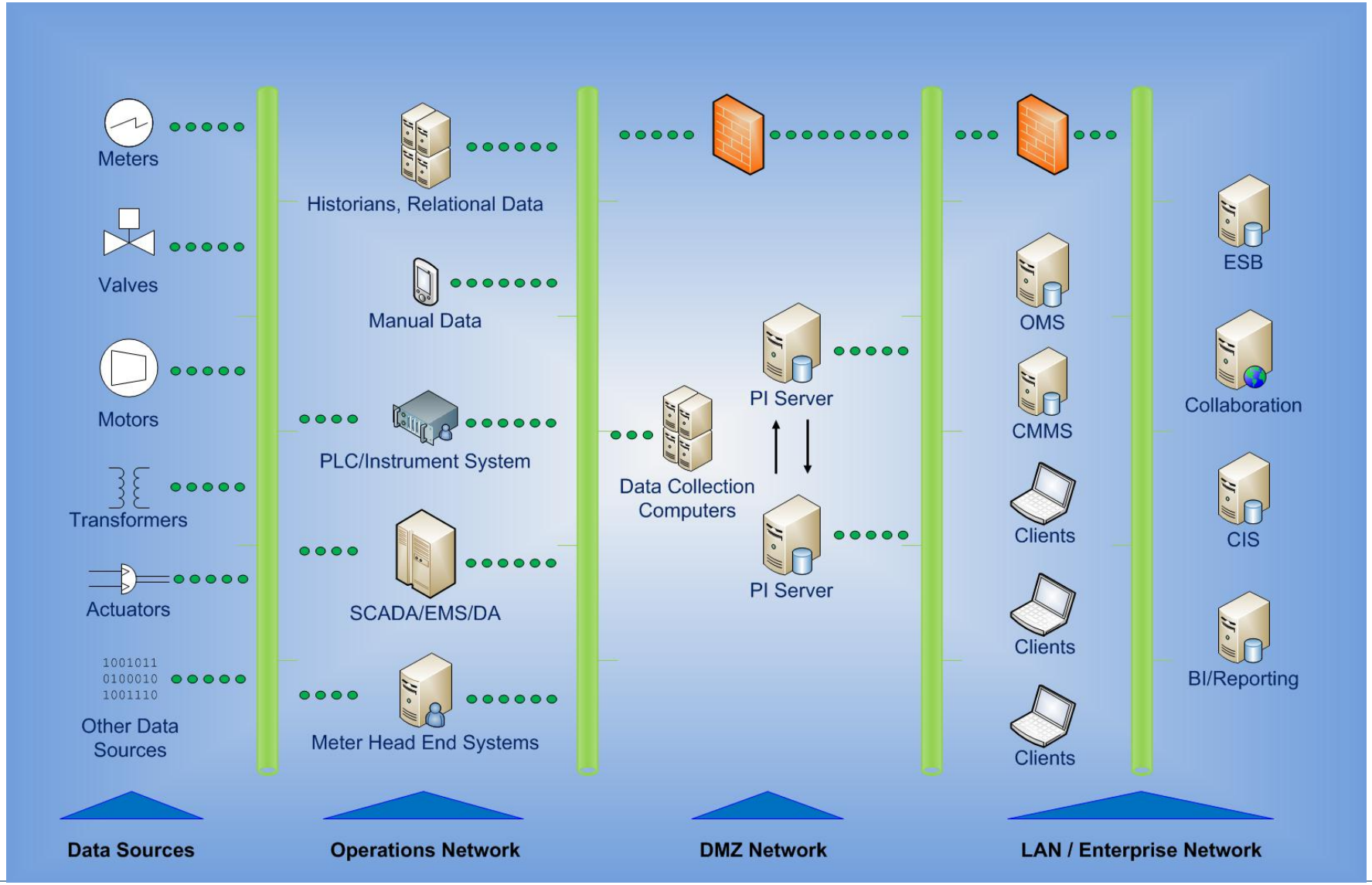
Sustainability—It Is Just Good Business

Denver Regional Seminar, October 19, 2010

Jon Peterson, VP Marketing

Empowering Business in Real Time

What is the PI System?



Empowering Business in Real Time

Real-time Data and Event Infrastructure

- Business Challenges
  - Quality
  - Reliability
  - Compliance
  - Trading and Markets
  - Capital
  - Environment, Safety, Health & Hygiene
  - Innovation
  - Performance
  - Variable Costs
    - Energy
    - Materials
  - Personnel

- Capabilities
  - Archiving (digital retention)
  - Analysis
  - Reporting
  - Notifications
  - Trending
  - Ease of access to data
  - Ease of use of the data
  - Availability of data
  - Scalability & Extensibility
  - Visualisation
  - Contextualize

OSIsoft—Thriving for 30 Years

- Core competencies
  - Focus
  - Understanding proper technology to leverage
    - HP-> DEC -> Microsoft/Intel
    - Standards such as TCP/IP
  - Commitment to our customers
    - Customer Support!
- OSIsoft's energy and resource efficiency efforts
  - Enterprise Agreement Program
  - Significant move to remote installs—on site is rare today
  - Less shipment of products—download are preferred by many customers
  - Electronic books
- OSIsoft is a key enabler of sustainability initiatives

What is Sustainability?

"A sustainable United States will have a growing economy that provides equitable opportunities for satisfying livelihoods and a safe, healthy, high quality of life for current and future generations. Our nation will protect its environment, its natural resource base, and the functions and viability of natural systems on which all life depends."

Sustainable America: A New Consensus (Washington: President's Council on Sustainable Development, 1996), p. iv.

(http://clinton2.nara.gov/PCSD/)

(http://clinton2.nara.gov/PCSD/Overview/index.html)

The United Nations' "World Commission on Environment and Development" definition of *sustainable development*: "...meet the needs of the present without compromising the ability of future generations to meet their own needs."

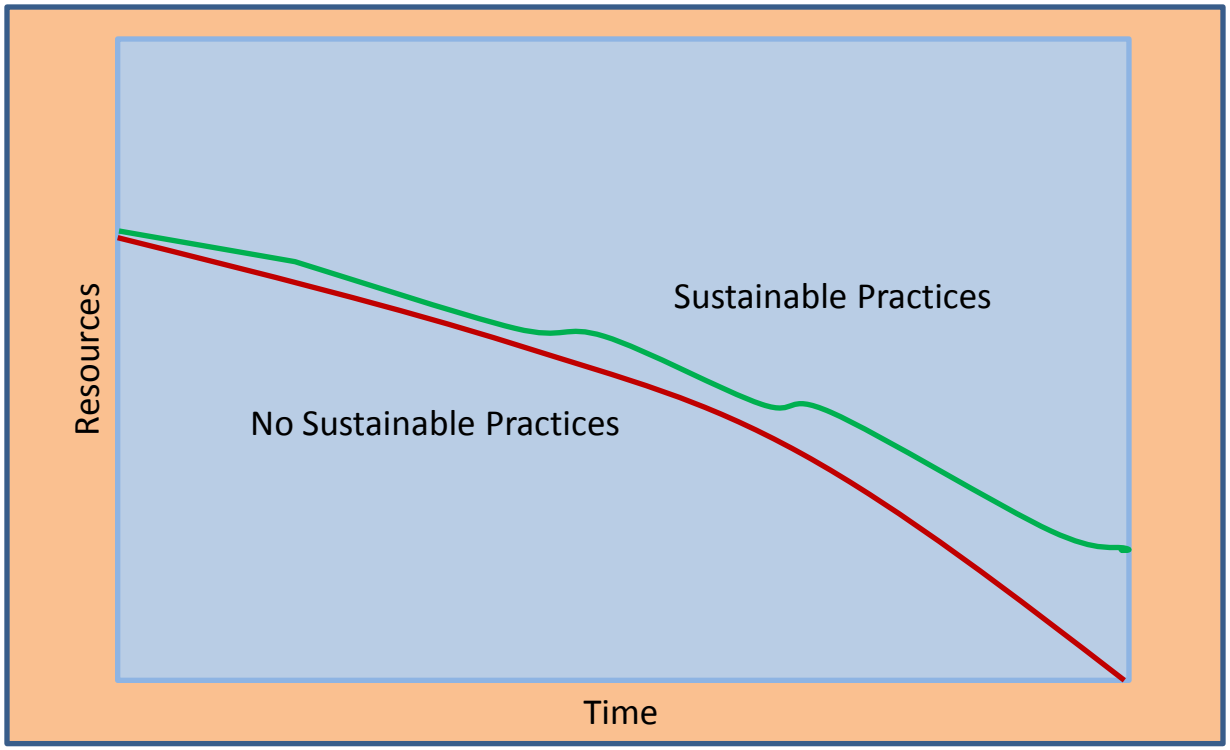
Our Common Future (aka Brundtland Report) (Oxford: Oxford University Press, 1987), p. 43.

(23 years old, still heavily referenced in UN documents)

What is Sustainability?

- Meet current needs
- Growing Economy
- Without compromising the future

- Sustainability cannot exist without a strong, efficient industrial base



Industry Roles in Sustainability

Utilities supply the electrical energy and water infrastructure society cannot function without

Oil and Gas supply the energy source for many uses

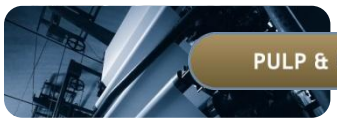
Very important in transportation

Strong light-weight polymers and fibers required for efficient transportation, renewable generation and many other structures

Extremely important for quality of life

Natural resources saved through disease prevention and cure

Fundamental to the modern infrastructure. Mechanical structures, electrical conductors, catalysts.



True renewable resource. Very important to packaging and communication.

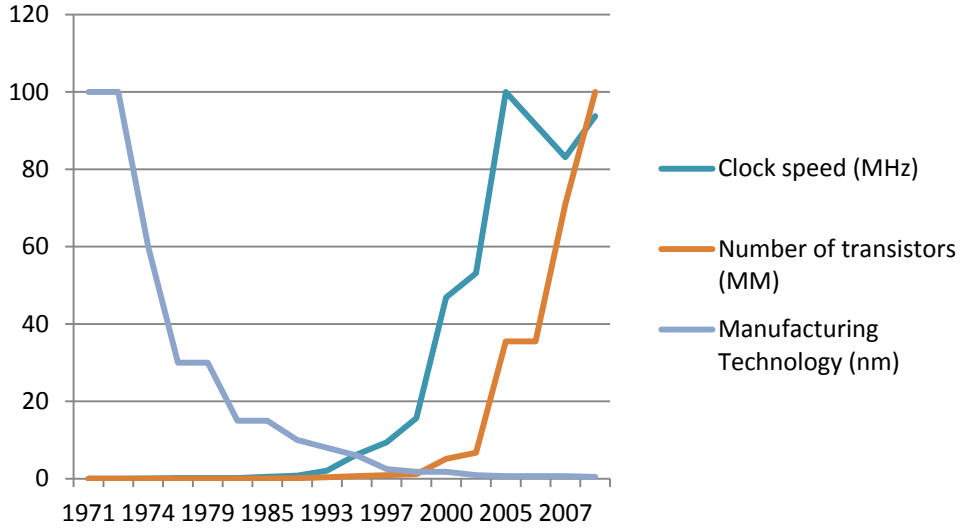
Data and transactions for the information driven economy

Sustainability Example: Intel and Moore's Law

- Moore's law:

  "In 1965, Intel co-founder Gordon Moore predicted that the number of transistors on a chip would double about every two years. Since then, Moore's Law has fueled a technology revolution as Intel has exponentially increased the number of transistors integrated into its processors for greater performance and energy efficiency."

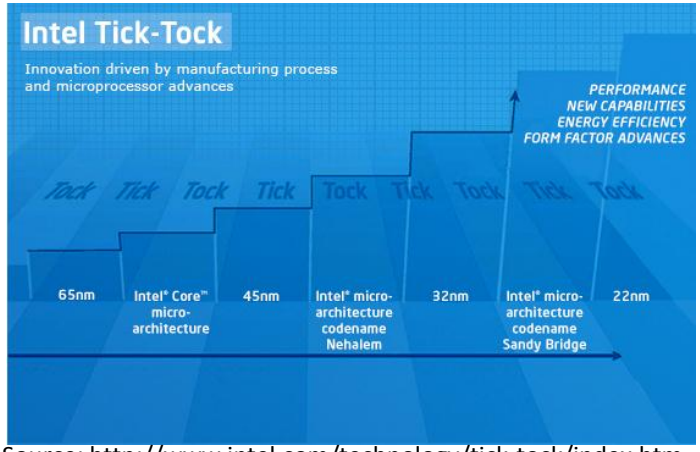
- More of a challenge that Intel lives by than a law.
  - F = ma is a law of nature
  - Moore's law is based on sustained human innovation
- Trends of Intel process or technology



Intel and Moore's law

- Created a set of business and technology processes
  http://www.intel.com/technology/tick-tock/index.htm
- Chip technology is governed by two main factors:
  - Chip fabrication technology
  - Chip architecture
- Two year cadence
  - Tick: on even years deliver new silicon process technology
  - Tock: on odd years deliver entirely new processor microarchitecture

"Intel has successfully implemented a product development strategy that has truly transformed the industry and created a ***sustainable*** competitive advantage"
Diane Bryant, VP/CIO, Intel Corporation



Source: http://www.intel.com/technology/tick-tock/index.htm

eBay, Intel, and Sustainability

- eBay is a transaction intensive business
- Data centers are key
- Data centers are limited by:
  - Available electrical power
  - Power to run the computers and networks
  - Power to remove the waste heat
- Running out of capacity often means building a new data center
- eBay manages capacity by proactively replacing computers after 18-24 months
  - Moore's law brings more compute capacity for about the same power requirements
  - Most cost effective way to grow, sustain their business

Sustainability is Continuous Improvement

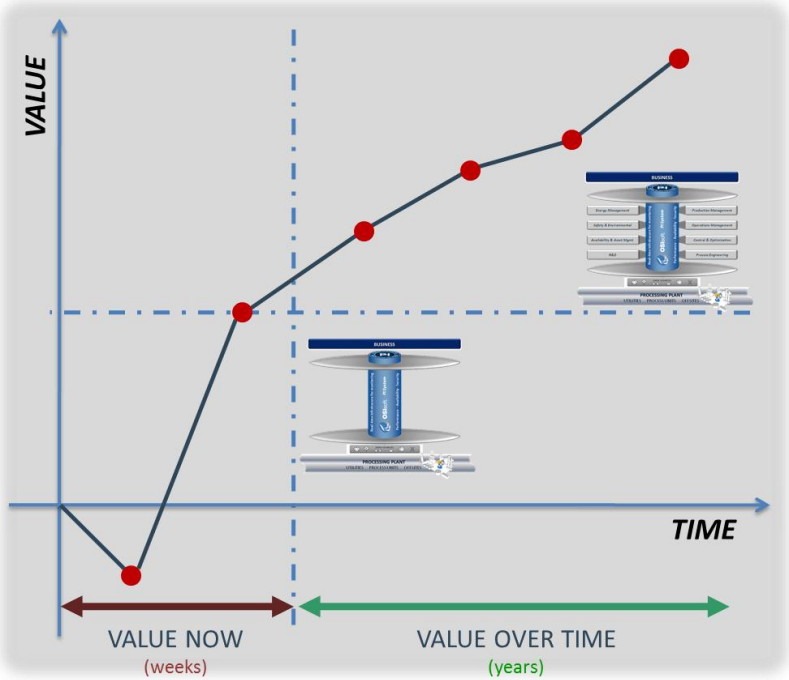
- Definition: “meet the current without sacrificing the future”
  - The future starts tomorrow and continues…
- Sustainability is not a project
- Must be in the DNA of any organization that wants to sustain
- As demonstrated in previous examples strong companies already have the required genes to sustain
  - Manage external disruptions
    - Natural
    - Economic
    - Political
    - Technology
  - Innovate
  - Continuously improve

Sustainability is Continuous Improvement

- Context is internal:
  - Energy efficiency
  - Resource efficiency
  - Capital efficiency, avoidance or delay
  - Employee well being
- Context is external:
  - Environmentally responsible
  - Socially responsible
  - Society well being
  - Trust

Continuous Improvement

- Four core phases:
  - Measure
  - Analyze
  - Improve
  - Control
- What to measure and control?
  - Disruptions force change
  - Infrastructure is only approach that can deal with change



"By far, the greatest benefit to IP was Environmental Monitoring, and *this requirement wasn't even on the radar screen when we justified the Enterprise roll-out*. This came up very immediately after the deployment, and we were able to quickly respond to this operational challenge because we had a common infrastructure to integrate with. We had disguised many disparate systems under a common real-time layer, so our programs had enterprise applicability."

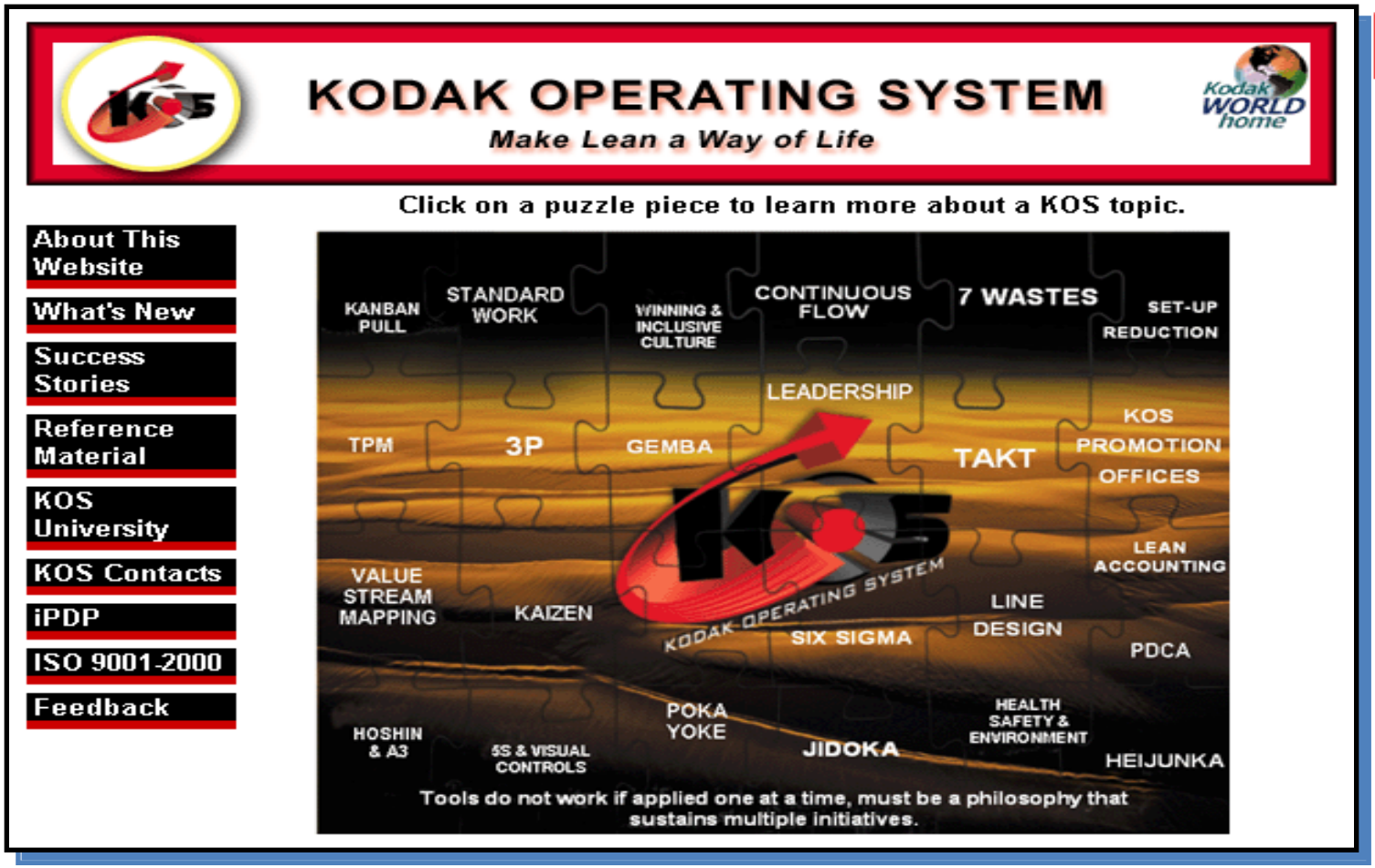
International Paper Company

Kodak Case Study - Energy

- Fuel and purchased power are significant cost at Kodak Park (Rochester, NY, USA)
  - Engaged everyone in conservation efforts
  - PI System: 100K tags, 150 Webpart users, 250+ SAP iView pages, 30 interfaces
  - Now correlate production volume to energy
- "There was no 'Big Bang." Rather, there were 1,000 little bangs
  - Established a culture of continuous process improvement
  - Everyone can see the data via browser

http://videostar.osisoft.com/uc2010/Sustainable_Seminar/video/SSS_UC2010_Opening_Kodak_Breeze.wmv

Kodak Case Study - Kodak Operating System

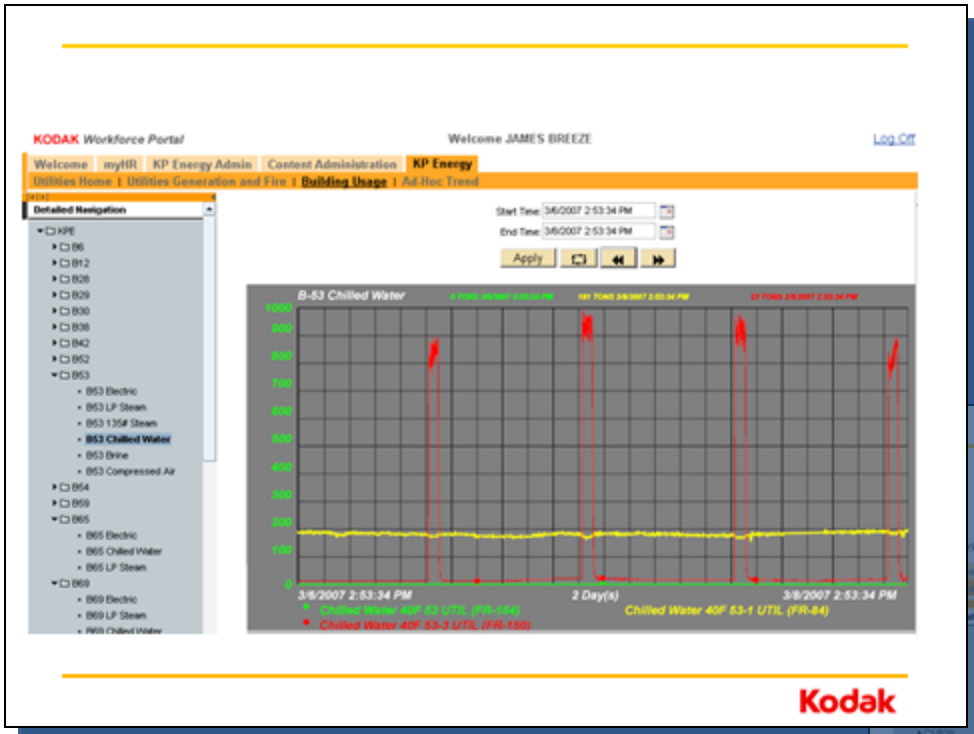


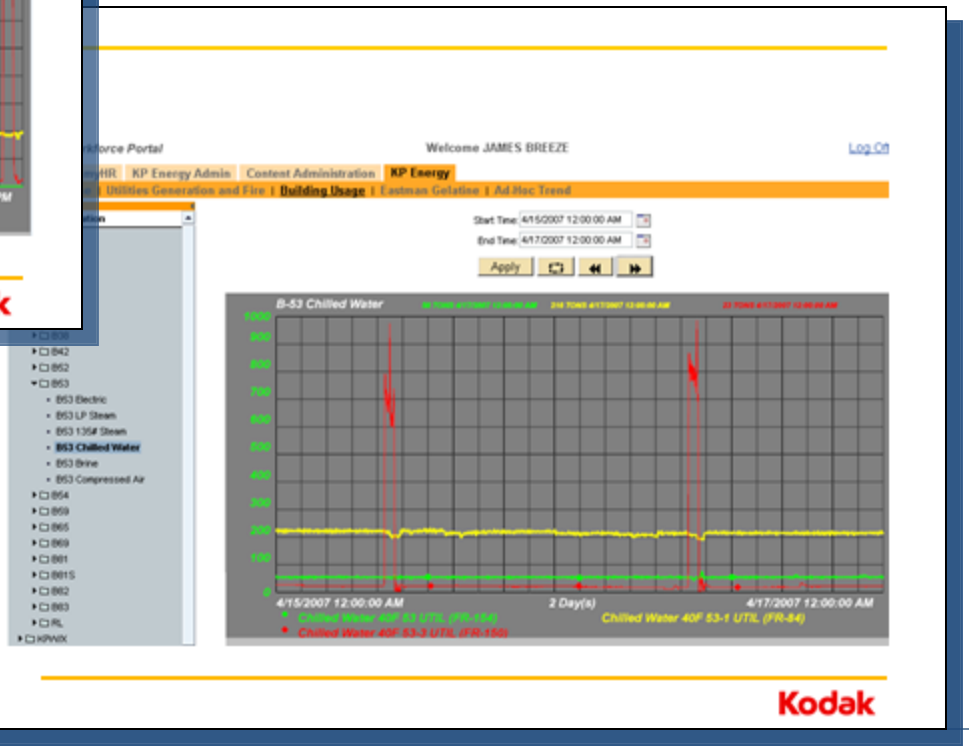
Kodak

Energy Kaizen: 3-5 days, 6-8 people, action rather than analysis

Energy Gemba: shorter focused Kaizen; observe abnormality take immediate action

Kodak Case Study - Energy





Carbon recovery regeneration

- Load on steam and chilled water system
- Awareness allowed optimization and move to off peak times

Kodak Case Study - Energy

- Reduced utility costs with improved
  "
- S
  t

Kodak

Summary of Results

Generation side findings

- Plant loading optimization
- Boiler fan optimization
- Exhaust head improvements
- Better management of self generation vs. purchased power

The Energy Information System (EIS) has been an essential tool to help us reach our Goal of:

"One Powerhouse for Eastman Business Park"

(10:41:53 March 28, 2007)

- Collectively the "annual" savings rate in 2007 was $27 Million
- Today the "annual" savings has grown to more than $30 Million
- The cumulative savings is now in excess of $100 Million

(>50% Savings From Ongoing Operations)

Kodak

ized water

Kodak Case Study - Water

- Kaizen and Gemba applied to water conservation
-
-

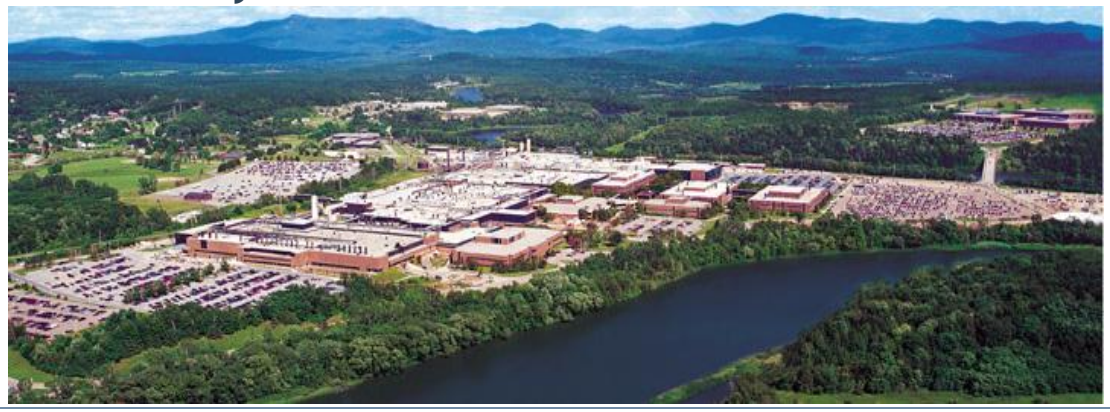
Water Reduction Results

- 2009 Kodak Water Reduction was 16.5%
- 1,087,000,000 Gallons (or 1,087,000 K Gallons) saved in 2009
- 1st Quarter of 2010 – an additional savings of 450 Million gallons from the 2008 Baseline
- Roughly 1.5 Billion Gallons saved in the last 15 Months
- This is enough water to fill approximately 250 average backyard swimming pools each and every day !!!
- $0.00 In Capital Spent
- These Water Savings are calculated for only the last 15 months and are totally independent of the site's energy reductions

Kodak

IBM Case Study

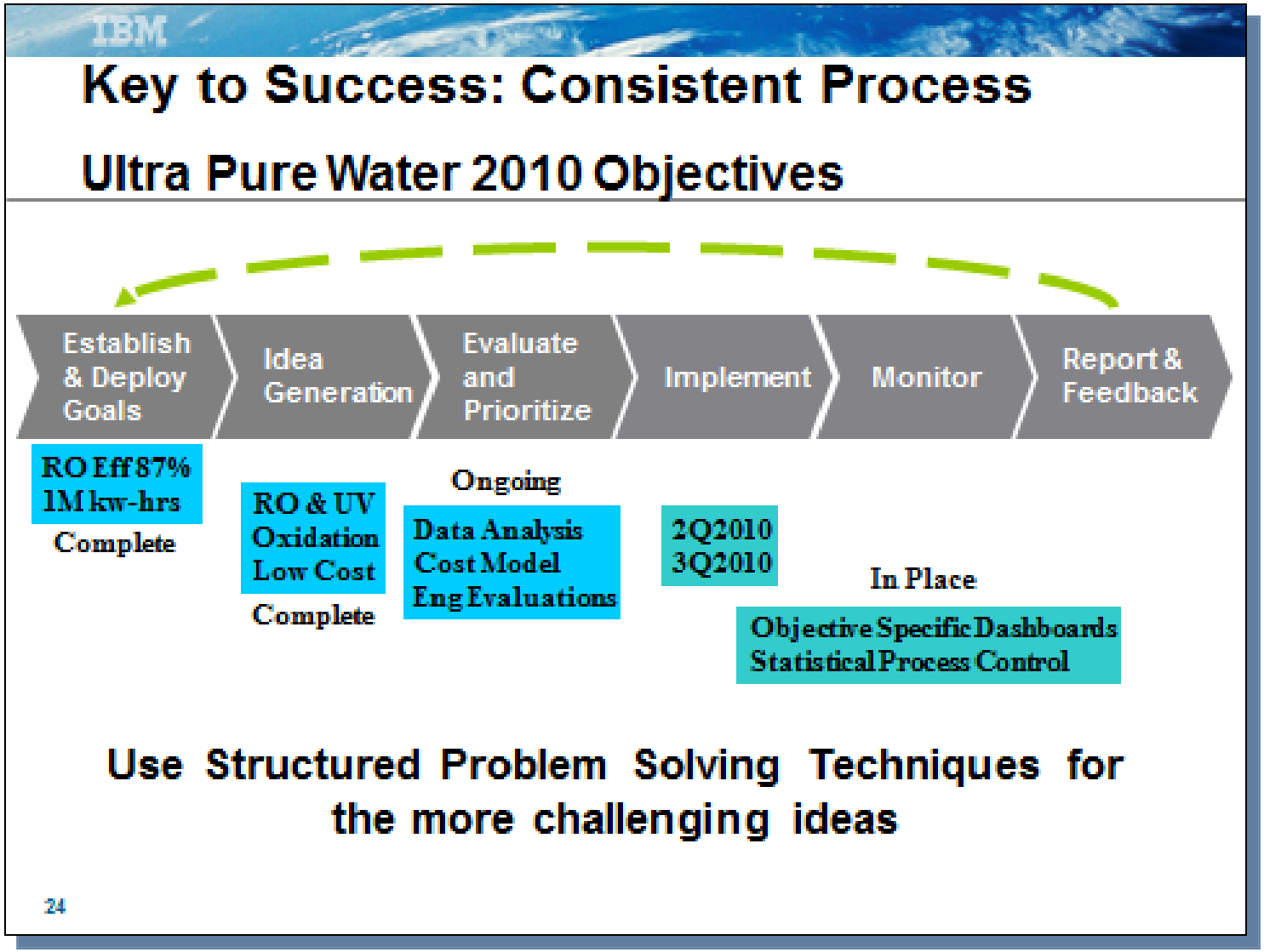
- IBM Burlington (Vermont, USA) is a large semiconductor manufacturing site
  - consumes 3.2 million gallons per day of water and 446 million kilowatt hrs of electricity annually
  - 3.5 million square feet of manufacturing space
- Challenge
  - Reduce water consumption to reduce cost
  - Less water means less energy, chemicals, maintenance and labor
  - Will also minimize environmental impacts
  - Leverage data acquisition, storage and visualization tools to monitor water usage and improve efficiency



IBM Case Study

- Approach
  - Used PI System to collect/store data from sensors, IT network and servers
  - Statistical process control techniques used to continually analyze operational data
  - Identifies process improvements that reduce water consumption, electrical consumption, and cooling load
- Results
  - IBM achieved over $3.6M in annual savings
  - Reduced water usage 27% while increasing manufacturing capability 30% in last 10 years

- Case study available on OSIsoft website: http://osisoft.fullviewmedia.com/uc2010/12-IBM.html



IBM Case Study

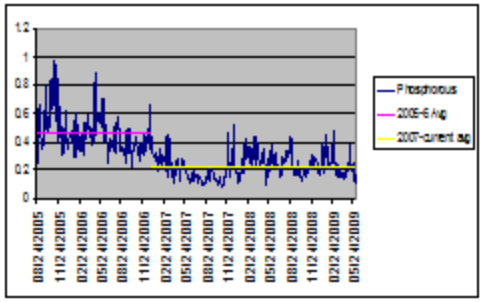
IBM

OSIsoft

Center of Excellence for Enterprise Operations
SMART Waste Water Results

Burlington Waste Water Management Goals
- **Quality:** Meet or exceed regulatory requirements
- **Reliability:** Zero manufacturing down time
- **Cost:** $450K/year reduction in annual cost

Phosphorus Discharge



Units mg/l
NPDES limit 1.2 mg/l

NPDES Discharges
Phosphorus: - 48%
Fluoride: - 44%
TDS: - 54%

Waste Water Sludge
Disposal Cost: - $49K/yr
Generation: - 600K lbs/yr

Water & Waste Water Chemical Usage
Annual Costs: -$401K/yr
Reduction: - 2,162K lb/yr

Manufacturing Capability
Up 30% since 2000 (excluding 2009)

14

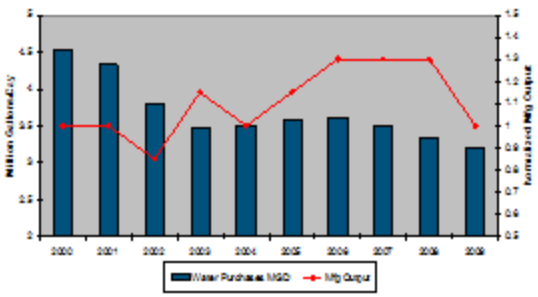
Smart Water Project

Phosphorous discharge well below compliance

Center of Excellence for Enterprise Operations
SMART Water Results

lington Water Management Goals
uality: 6 Sigma conformance to Specification
No impact to product yields
eliability: Zero manufacturing down time
ost: $3.6M/year reduction in annual cost

Water Use and Manufacturing Output



Water Usage
Rates: + 66% since 2000
Usage: - 29% since 2000
Purchases: -$742K/yr

Water Treatment Costs
Annual Costs: - $59SK/yr

Water Related Energy Costs
Annual Costs: -$2,278K/yr

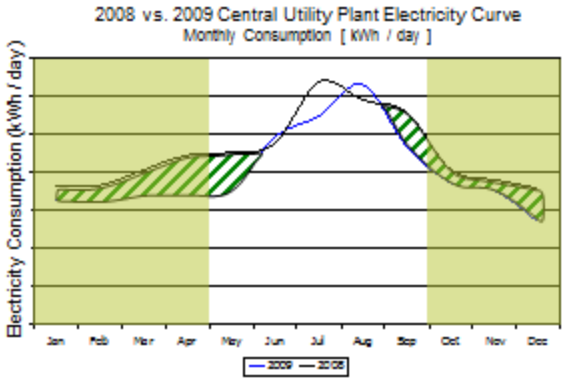
Manufacturing Capability
Up 30% since 2000 (excluding 2009)

15

IBM Case Study

B963 / B971 Central Utility Plant Reporting Results

- Reporting Results:
  - Energy Savings: 4,800,000 kWh
  - Money Savings: $390,000
  - Annual Energy Savings equal to 650 homes electricity consumption [Vermont]



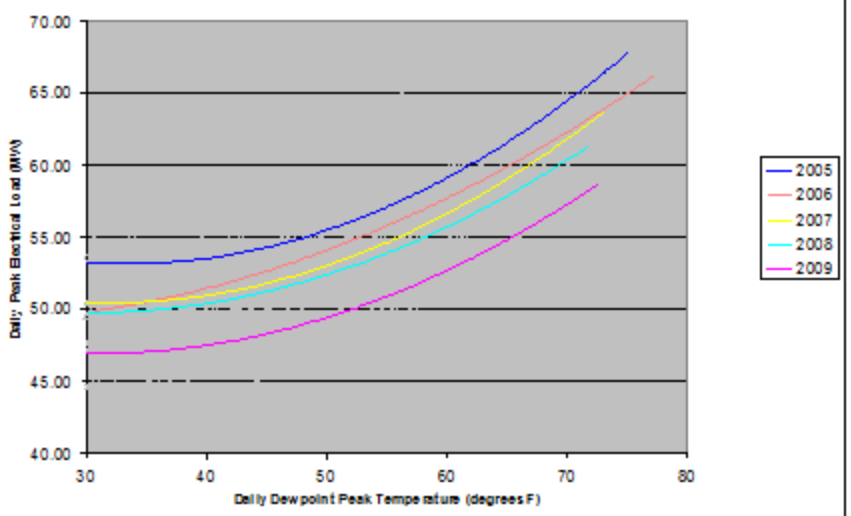
- Results Exceeded Expectations
  - Central Utility Plant personnel clearly recognized and understood goals
  - Energy Savings exceeded Goal by $40,000
  - Winter Free-Cooling Utilization exceeded expectations by 60 days

19

Free Cooling Project

Leverage cold ambient temperatures of Vermont

Average Peak Electrical Loads at IBM VT 2005-09



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Alcoa

- Faced recent hardships
  - Price collapse
  - Demand destruction
  - Credit crunch
- Extremely important part of sustainability value chain
  - Supplier of light-weight, strong materials

> "Throughout 2009, our industry and company experienced the most challenging economic environment that many of us can recall. Faced with a triple threat—aluminum prices crashing, broad demand destruction within our customer base, and a credit crunch that crippled our ability to initiate growth—we quickly executed our Cash Sustainability Program to strengthen our balance sheet, restore liquidity, and make Alcoa free-cash-flow neutral by the end of 2009."
>
> "I see an amazing future for Alcoa. Strong, lightweight, energy-saving and infinitely recyclable, our miracle metal will continue to contribute to the sustainable life and health of our planet and its people."
>
> Klaus Kleinfeld, Chairman & CEO

Alcoa

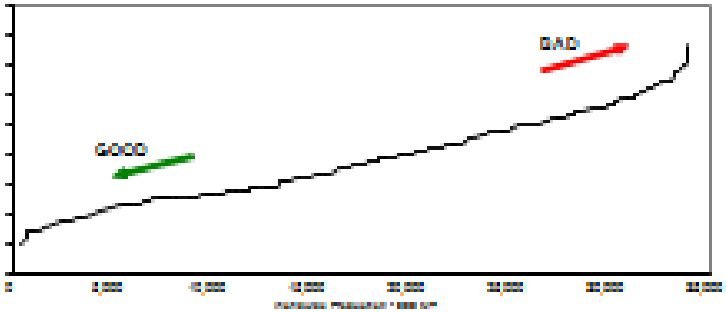
- Aggressive, transparent Sustainability Program
- Some key concepts
  - Life cycle assessment
  - Product design
  - Economic value of products
- Industrial Demand Response
  - Provide reliability to the grid
  - Reduce energy costs

Alcoa

- Commodity business
- Competitive advantage comes from production efficiency

Aluminum Smelting Economics

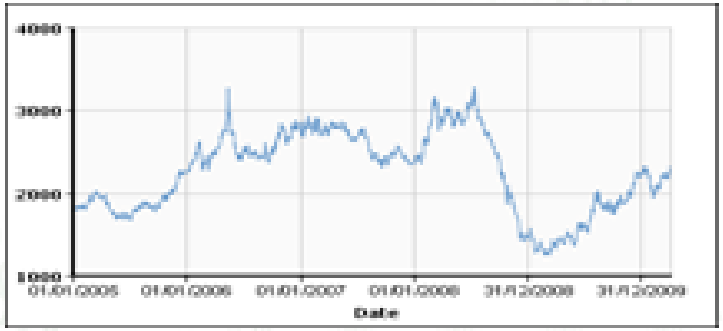
Energy is 30-40% of Aluminum Production Costs….



Worldwide Smelter Cash Production Costs

Warrick Operations is
Alcoa's Largest Operating U.S. Smelter

- **330,000 MT capacity/year**



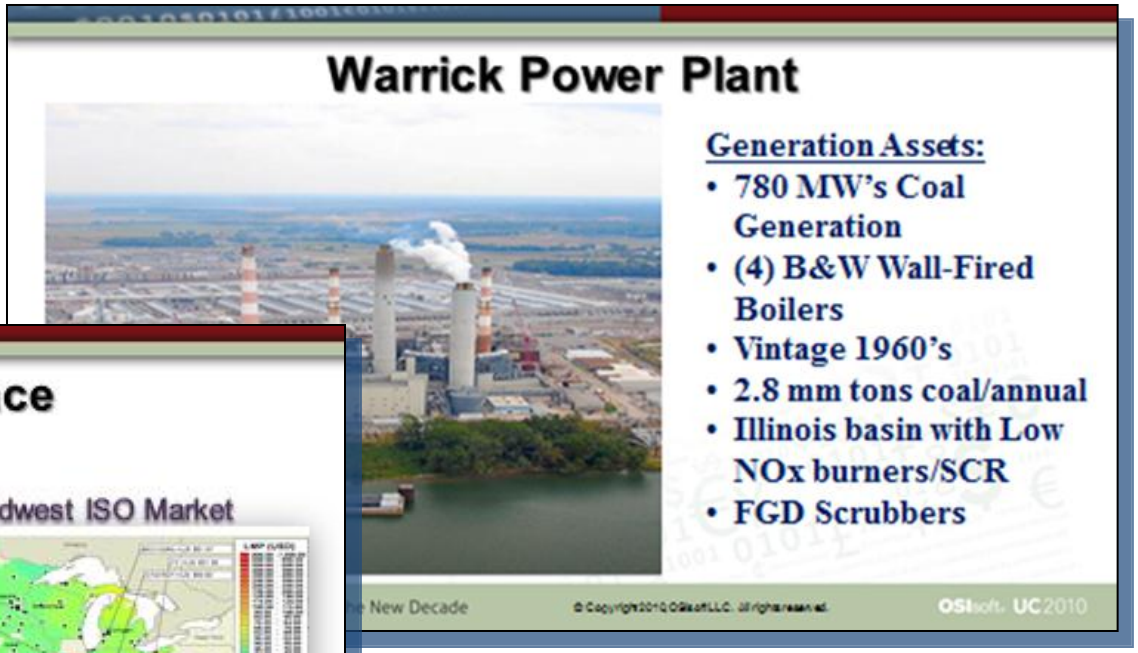
Competition in a Worldwide Commodities Market….

Real Time Information — Currency of the New Decade

OSIsoft. UC 2010

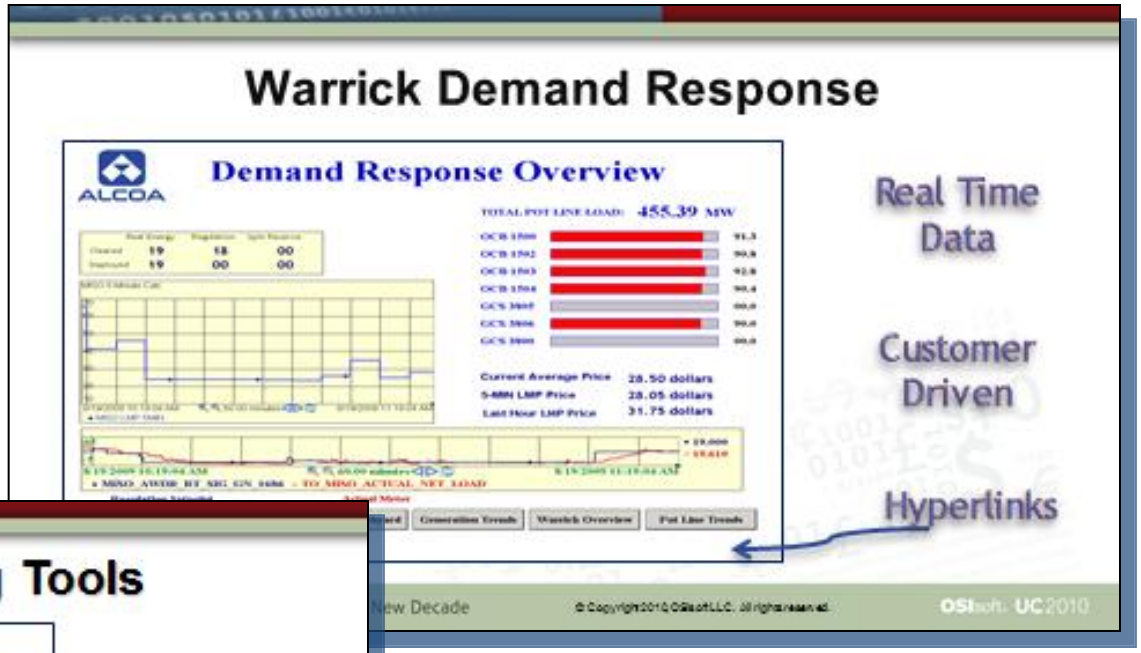
Alcoa

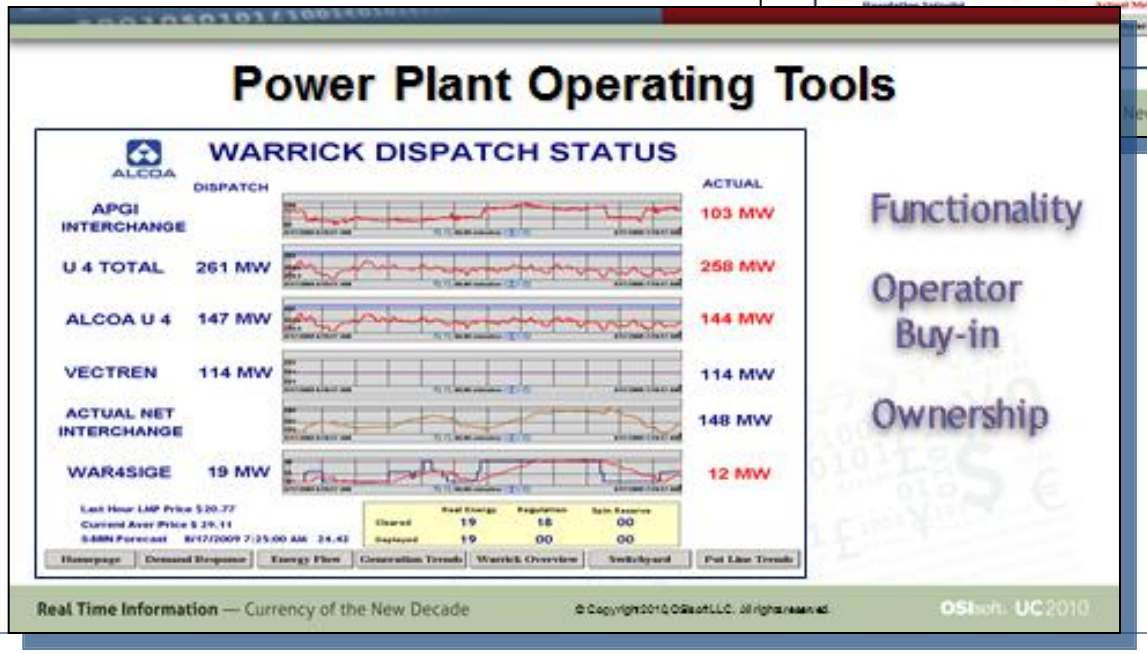
- 780 MW Generation
- FERC License—participate in markets as a generator



Alcoa

- MISO (Grid operator)
  - Reliability
  - Generation capacity
  - Congestion mitigation
- Alcoa
  - Sell power
  - Purchase





A.T. Kearney Study

- They studied the performance of sustainability-focused companies during financial crisis of 2008/2009
  - Some continued to focus on long-term health vs. just short term survival
  - Difficult to have this discipline
- Results
  - Stock market performance was 15% higher for these companies vs. their peers

"Create value for shareholders and society"

Sustainability

- Sustainability is about your company's long term survival
  - Not just carbon, Green House Gas (GHG) or other "green" initiatives
- Corporate initiative
  - engage in a culture of continuous improvement
  - improve compliance, public perception, and profitability
- Increase profits
  - Manage economic, social and environmental risks and opportunities
- Gain and Sustain the Trust of the general public
- Sustainability needs your company to sustain, to thrive
- This is just good business

Thank you

777 Davis St., Suite 250 San Leandro, CA 94577