Fleet Optimization

How Enterprise Infrastructure Enables Utilities

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Brief Agenda

- Overview of OSIsoft in Power Generation
- Overview of Iberdrola's Fossil and Wind Centralized Performance Centers
- Overview of DTE Enterprise Infrastructure initiative
- Overview of other OSIsoft Utility customer business value examples
- Questions

The PI System

- Real-time infrastructure platform
- Industry standard enterprise historian
- Safeguard company data
- Delivers enterprise-wide visibility into operational health to
  - Manage assets
  - Mitigate risks
  - Identify new market opportunities.
- Provides
  - Powerful data management
  - Decision support capabilities
  - Enables continuous improvement

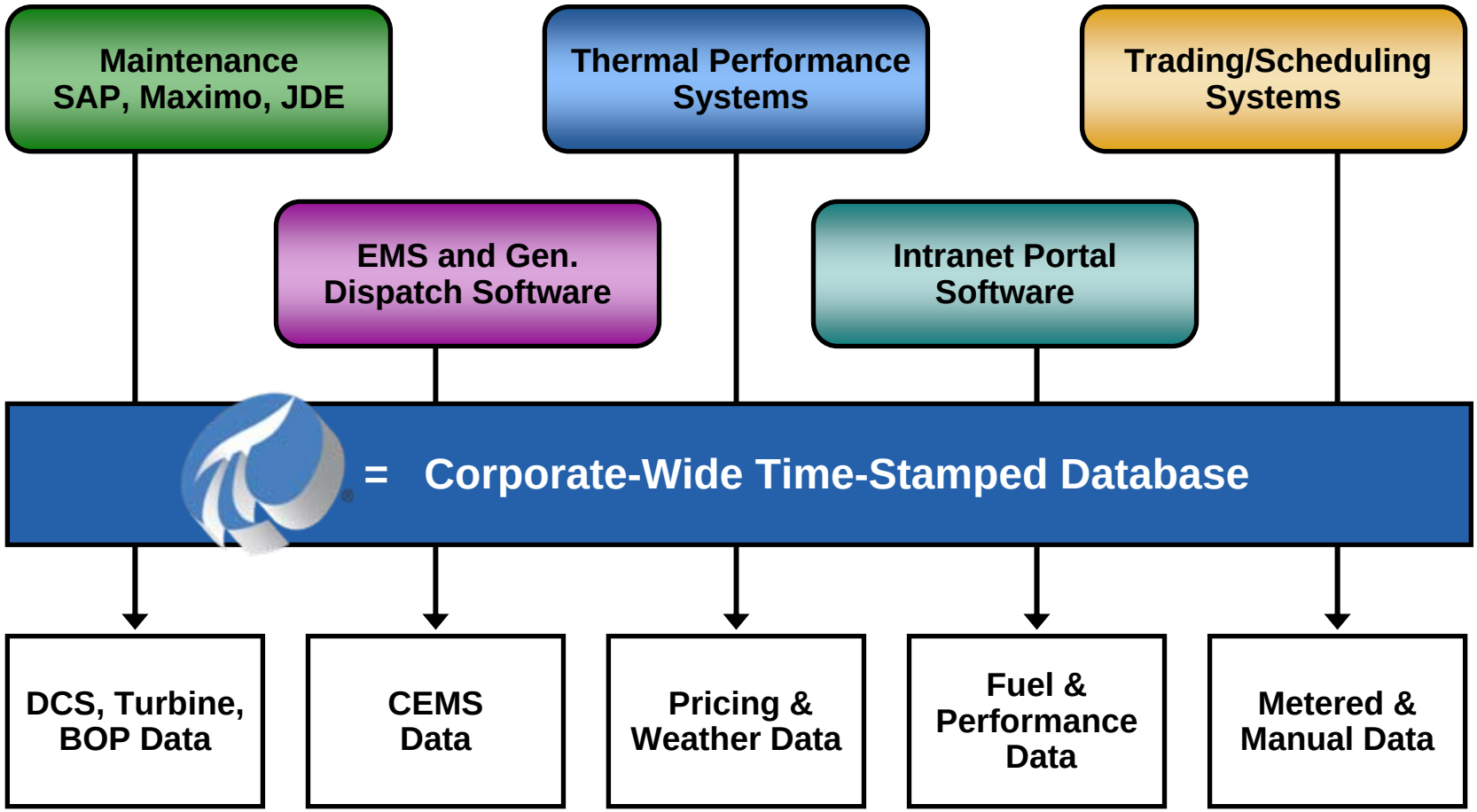
Power Industry Profile

- OSIsoft is the world leader in Power
  - Power Generation
  - Transmission & Distribution
  - Power Trading & Marketing
- Over 3000 installations worldwide
  - Over 57% of power generated & transmitted in US daily is monitored by the PI System
  - 63% of US nuclear units are monitored by the PI System today
  - 75% of US ISOs, 50% of the mid and large sized power producers, over 50% of ITOs use the PI System today
  - 17 of the top 20 owner/operators of wind use the PI System
- Representing the largest systems in the world

How Can I Use PI?

- Monitor assets
  - prime movers, BOP, substation equipment, IT infrastructure, etc. – implement industry best practices
- Collect, store, publish, display, and integrate PI data with other data sources
  - leverage existing systems
- Replay events and perform ad-hoc analysis
  - correlate Events/Conditions
- Event notification
  - alarming (including pre-alarm conditions)
- Monitor grid stability
  - enhance emergency response, contingency analysis, state estimation

Where Does the PI System Fit ?



Industry Trends

- Centralized Monitoring/Diagnostic/Performance Centers
  - Leverage dwindling SMEs
  - Virtually consolidate remote assets
- Environmental Stewardship
  - Optimize assets/fuels
  - Cap and Trade programs
- Proactive Asset Management
  - CBM/RCM
- End to End Enterprise Optimization
  - Integration of systems supporting complete operational business

Centralized Monitoring, Diagnostic, and Performance Centers

Iberdrola Centralizes Optimization of Wind and Fossil Assets

Iberdrola's WindCORE – Toledo, Spain

Iberdrola's WindCORE Project Benefits

- 1% estimated increase in Operation and Maintenance cost reduction (availability)
- O&M resources optimization
- Trading operations optimized through very precise production forecast
- Remote assistance
- Fault/lost energy calculations for economy dispatching

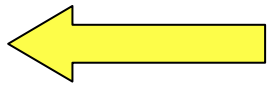
Iberdrola's WindCORE Project Benefits

Benefit Received			
MW	Capacity Factor	Availability	MWh Production
3494	27.5%	97%	8164534.62
3494	27.5%	98%	8248705.08

84170.46		MWh Gain from Availability Improvement
$ 80.00		Feed In Tariff USD/MWh
$ 6,733,636.80		

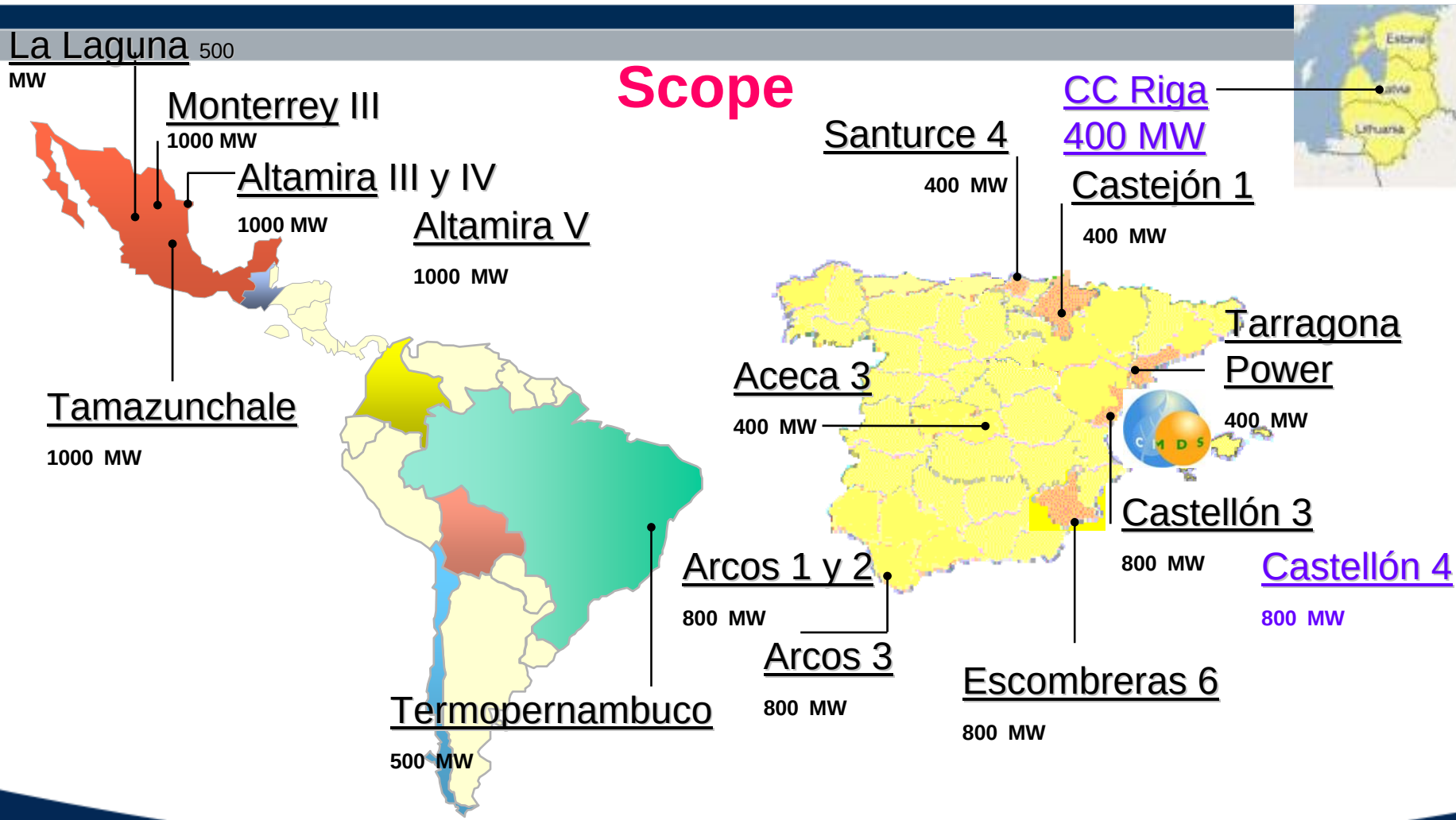
Cost Model for WindCORE	
System Cost	$ 1,500,000.00
Variable Cost p.a.	
Labor	$ 540,000.00
Utilities/Rent	$ 60,000.00

	Year 1	Year 2	Year 3	Year 4	Year 5
Total Cost	$ 2,100,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000
Net Present Value of Cost	$3,638,108				
Benefit	$ 6,733,637	$ 6,733,636.80	$ 6,733,636.80	$ 6,733,636.80	$ 6,733,636.80
Net Present Value of Benefit	$25,525,781				
Payout per Dollar Spent	**$ 7.02**				



- Cost Assumptions: Number of Wind Farms

IBERDROLA Centralized Monitoring & Diagnostic Center for Fossil



Tracking Contracts with CFE

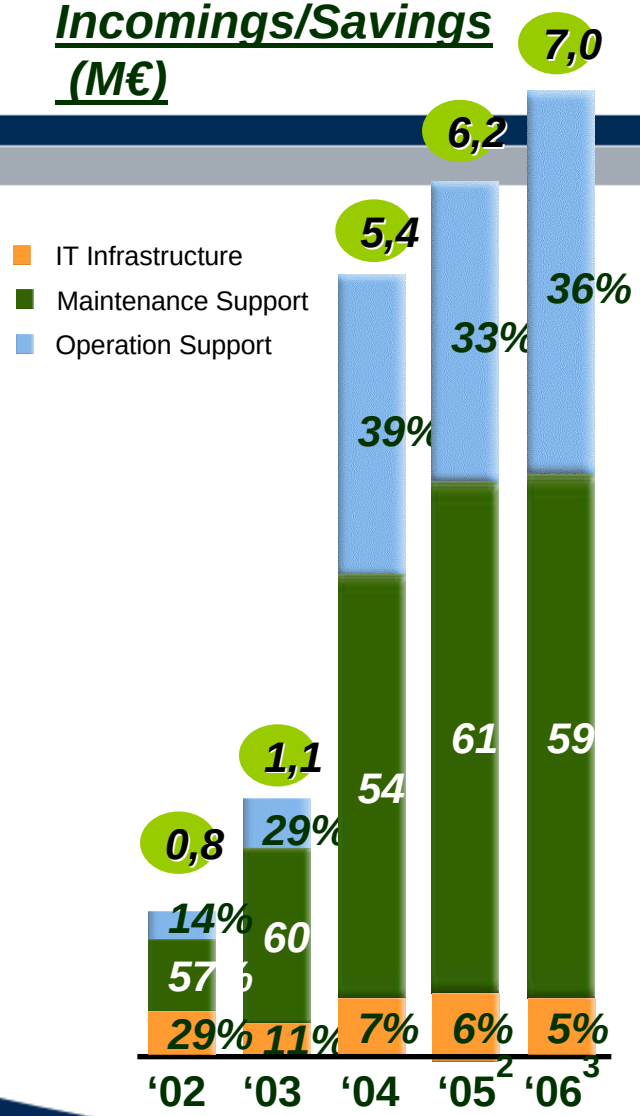
- MAINTENANCE / ENERGY CONTRACT TRACKING
  - Maintenance Contract Tracking – FS App
    - CSA between General Electric and Iberdrola
    - Bonus calculations based on FS (Factored Starts)
    - On the beginning manual calculations
    - First Option was to implement on Control Systems
    - GE proposal was 25K USD for GT
      - Iberdrola has more than 14 GE GT's so….350k USD!!!
    - We developed on ACE on 3 weeks!!!

Iberdrola Found That…

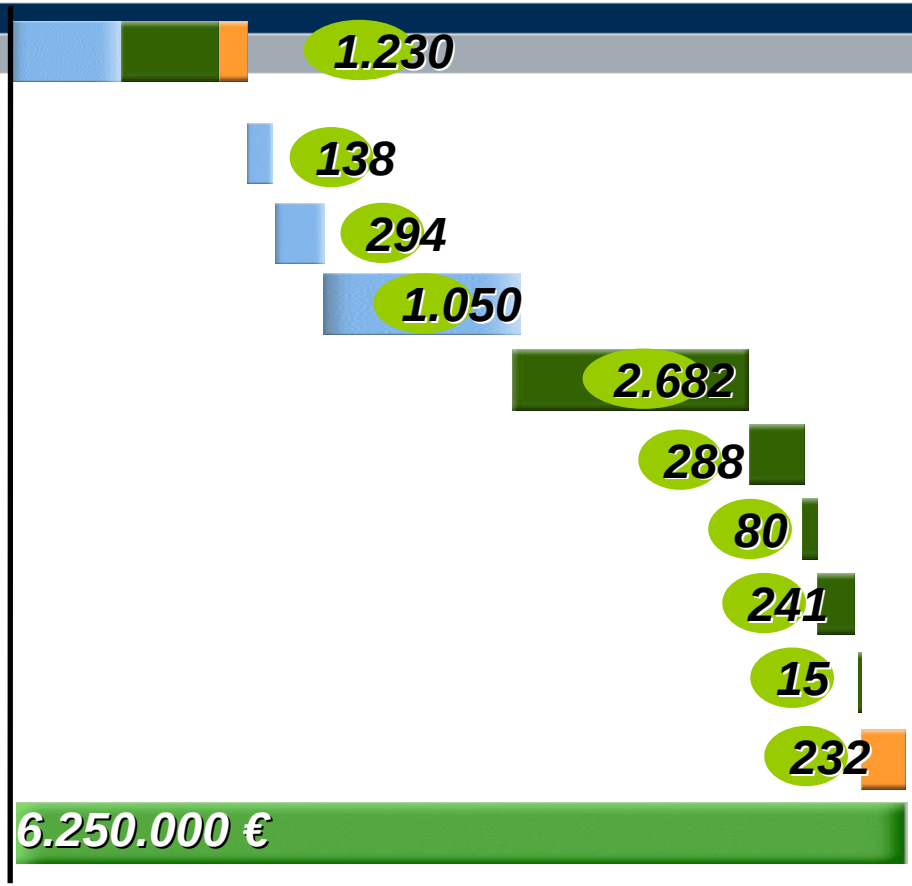
- Advanced Equipment Monitoring (AEM) concept really improves operation and maintenance of assets
- Moving to Rule Based monitoring is the key
- PI platform is a powerful tool: Robust and highly available
- Direct Cost Savings from developing on PI infrastructure > 500k USD

IBERDROLA & CMDS Value

Incomings/Savings (M€)



2005 Incomings/Savings split (miles €)

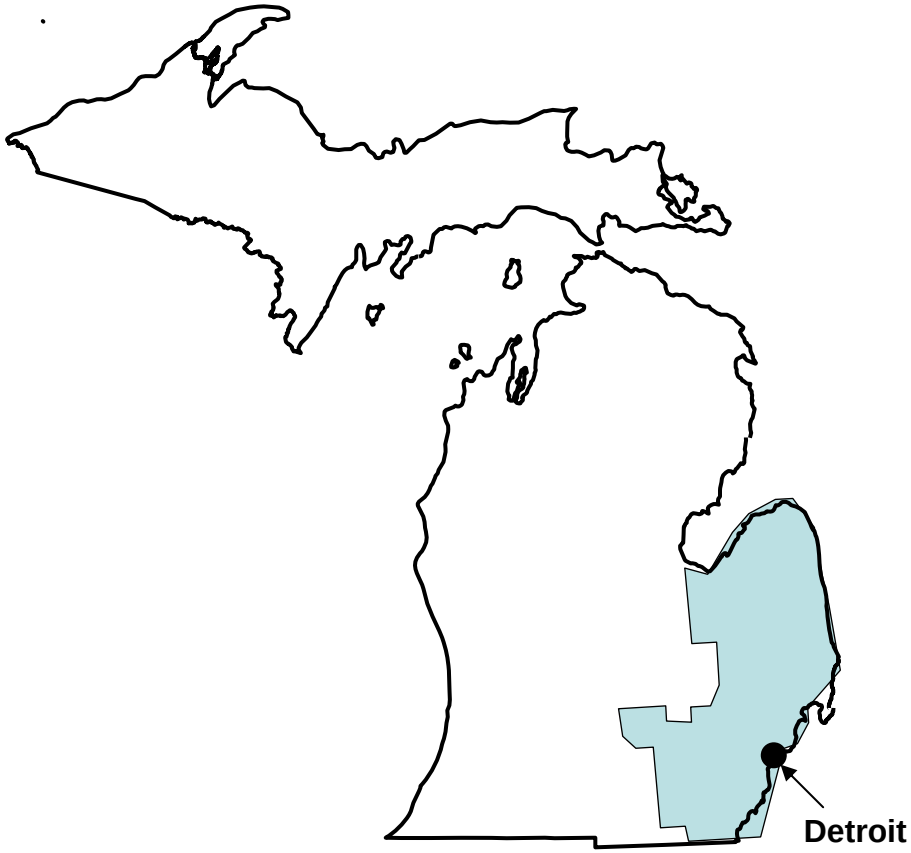


The CMDS provides earning, savings, know-how and flexibility to IBERDROLA

Centralized Monitoring, Diagnostic, and Performance Centers

Detroit Edison (DTE) Leverages Enterprise Infrastructure

DTE Summary

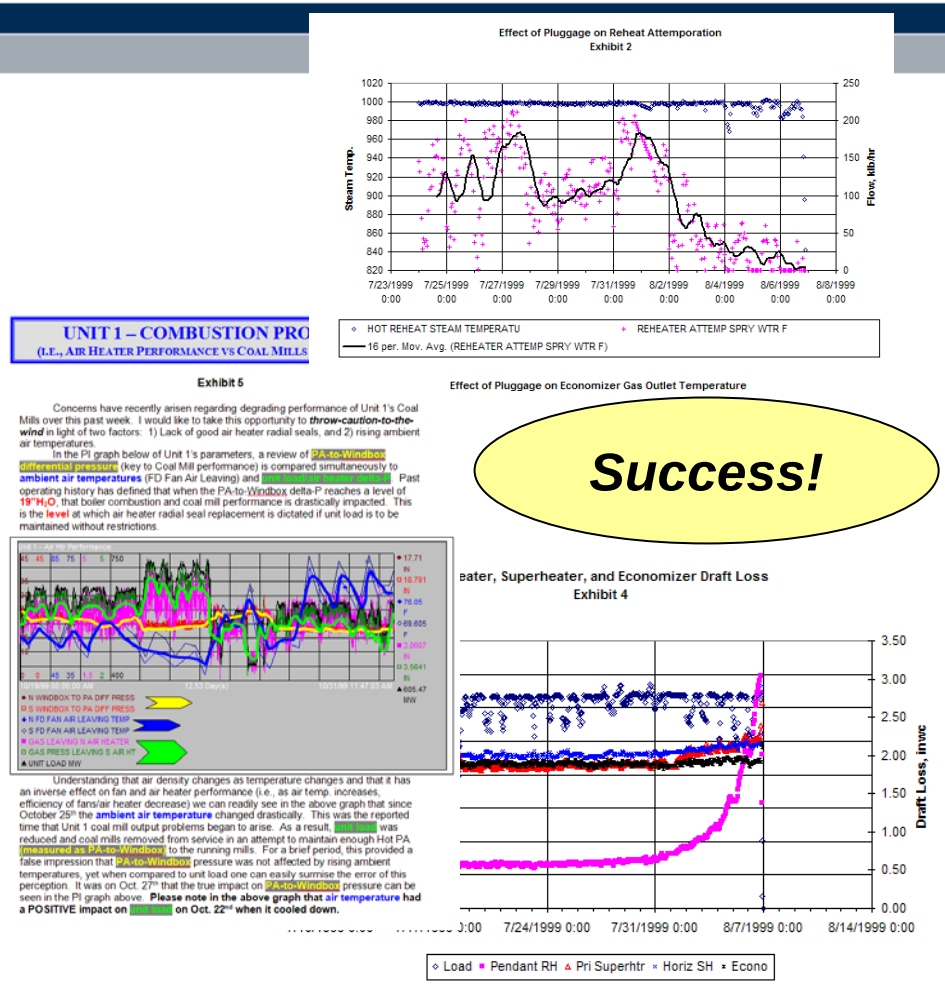


- Michigan's largest electric utility with 2.2 million customers
- Over 11,080 MW of power generation, primarily coal fired
- 54,000 GWh in electric sales
- $4.7 billion in revenue

DTE Energy - Detroit Edison

History of OSI PI in DTE Energy

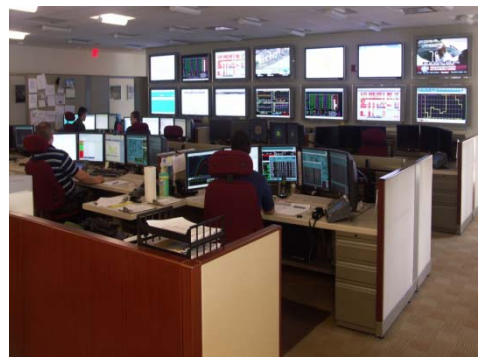
- Pilot at Monroe PP in 1998
- Fossil Generation Fleet 1999
- GenOps – EMS Ranger 2001
- SOC SCADA– 2002
- Fermi Nuclear– 2003
- DTE Subsidiaries – 2007
- **Enterprise Agreement** – 2007
- Continuous PI Expansion
  - Magnitude
  - Functionality



OSIsoft a Key Technology Enabler

- **Information** and **Application** Integration
  - **Primary data source** of process data (current & historic)
  - **Integral** part of many **Applications** (process and business)
  - **Communication Conduit** (plant status, fuel cost, control, EMS)
  - **Strategic** to DTE Energy's day to day Operation

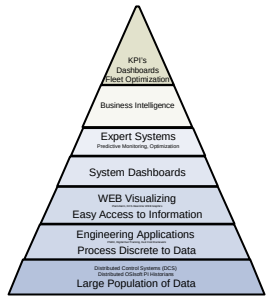
- **Performance Center** – Enabling Technology
  - Equipment Condition Monitoring – SmartSignal
  - Enables DCS Displays
  - Process & Market Analysis



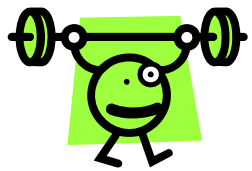
- DTE – OSIsoft Enterprise Agreement **(EA)**
  - Key to the Supply Cabinet

Why – OSIsoft Enterprise Agreement?

5 Key Benefits

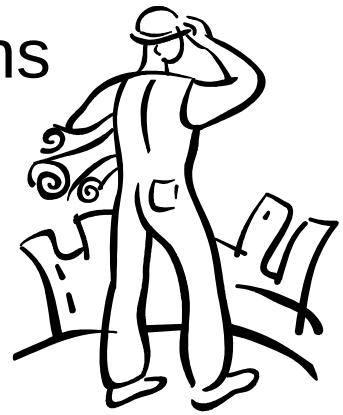


1. OSI is a DTE Core Technology



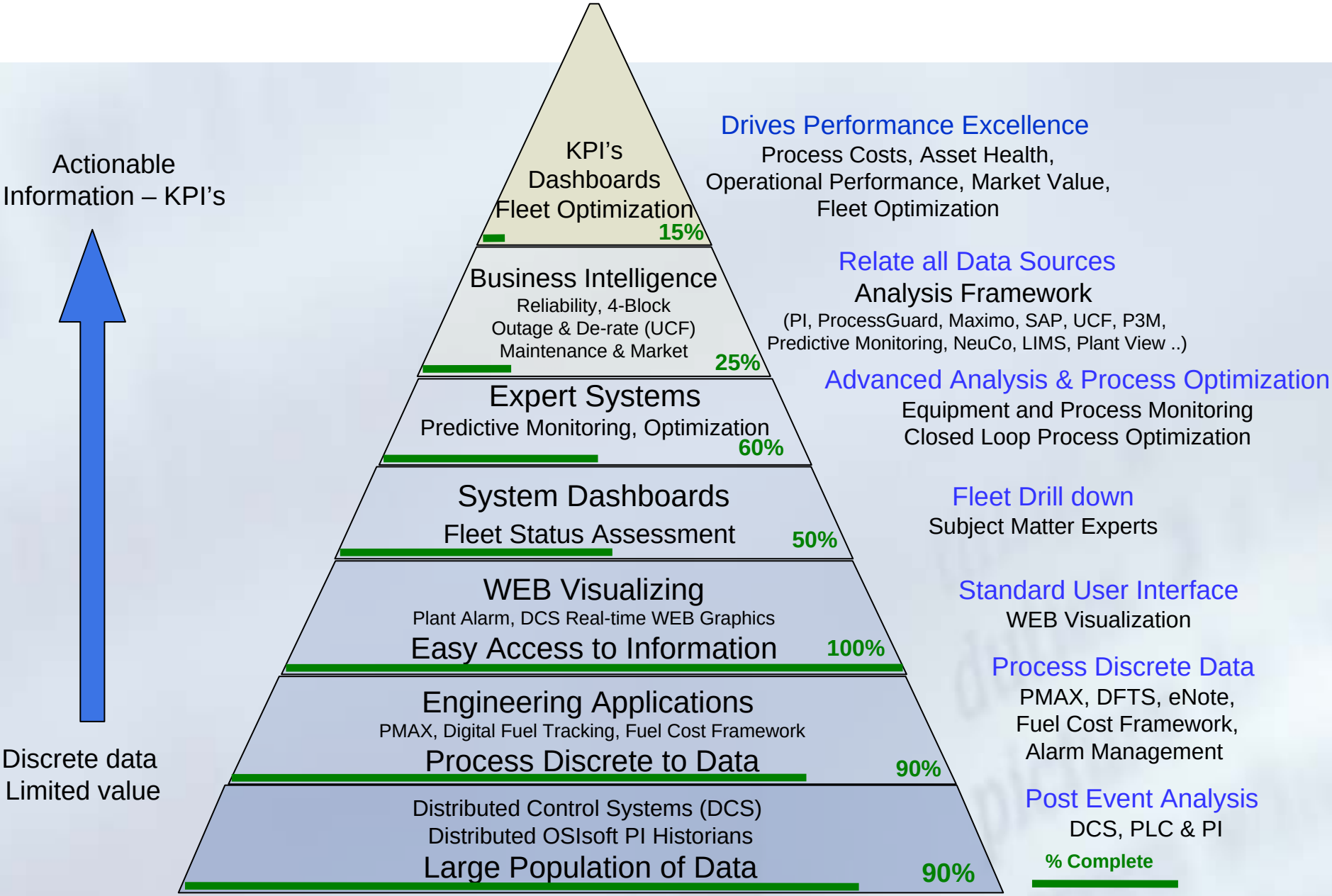
2. OSI's Strong Track Record & Future Direction
3. Expand DTE's Use of OSIsoft Applications

4. Normalize Budget Allocation

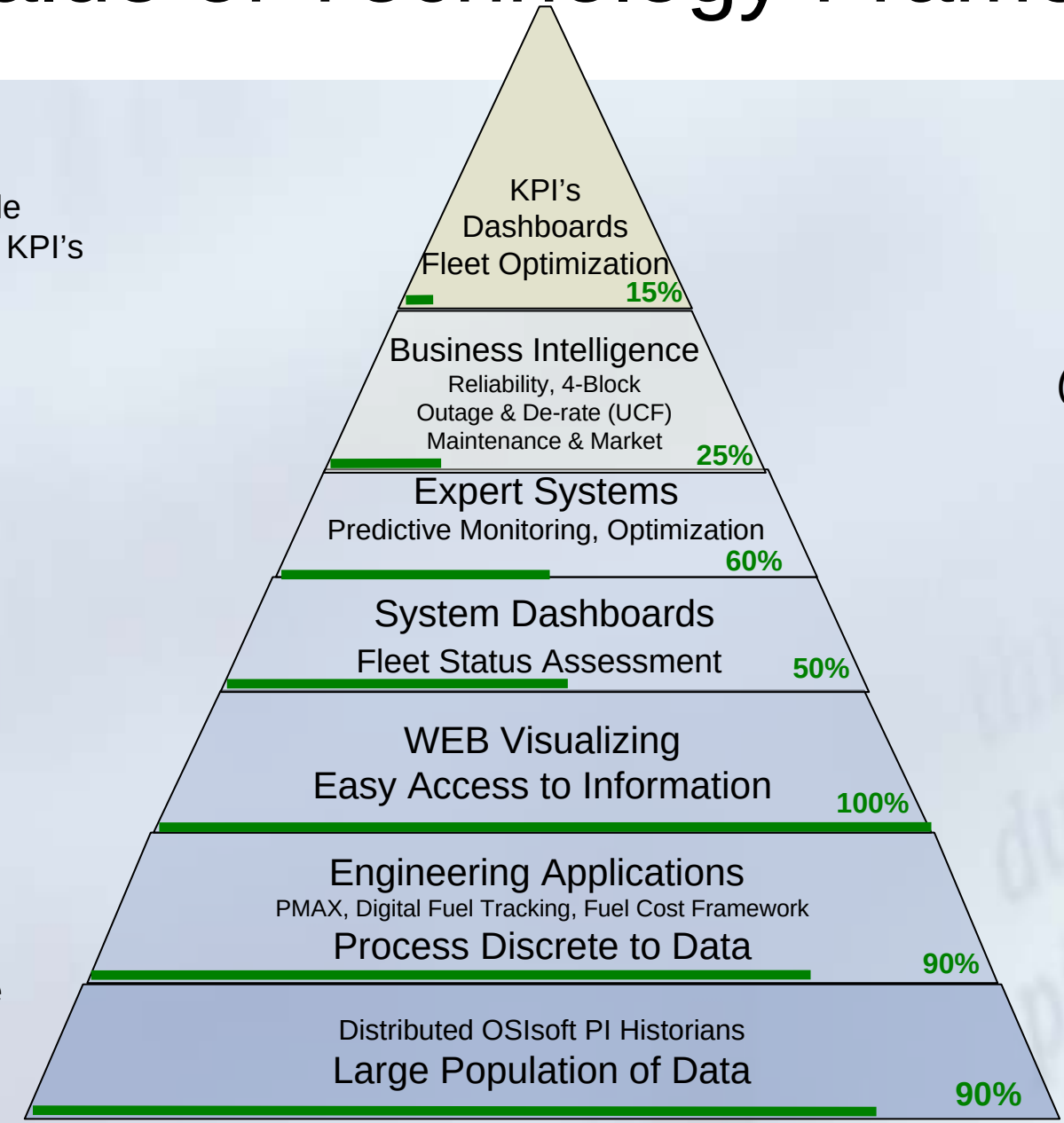


5. **Premium** Software Reliance Program

Technology Framework



Value of Technology Framework



Actionable Information – KPI's

Discrete data Limited value

Annual Savings

Fleet Optimization
$20,000,000
(Projected Savings)

$11,000,000

$1,000,000

$5,500,000

$4,500,000

$3,000,000

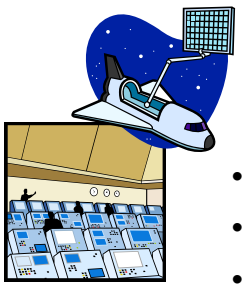
Fleet Performance Center

Performance Center – Mission

Equipment Performance Optimization of the Fossil Generation Portfolio through continuous “real time and **predictive** asset **condition monitoring**” to maximize the asset **market value**.

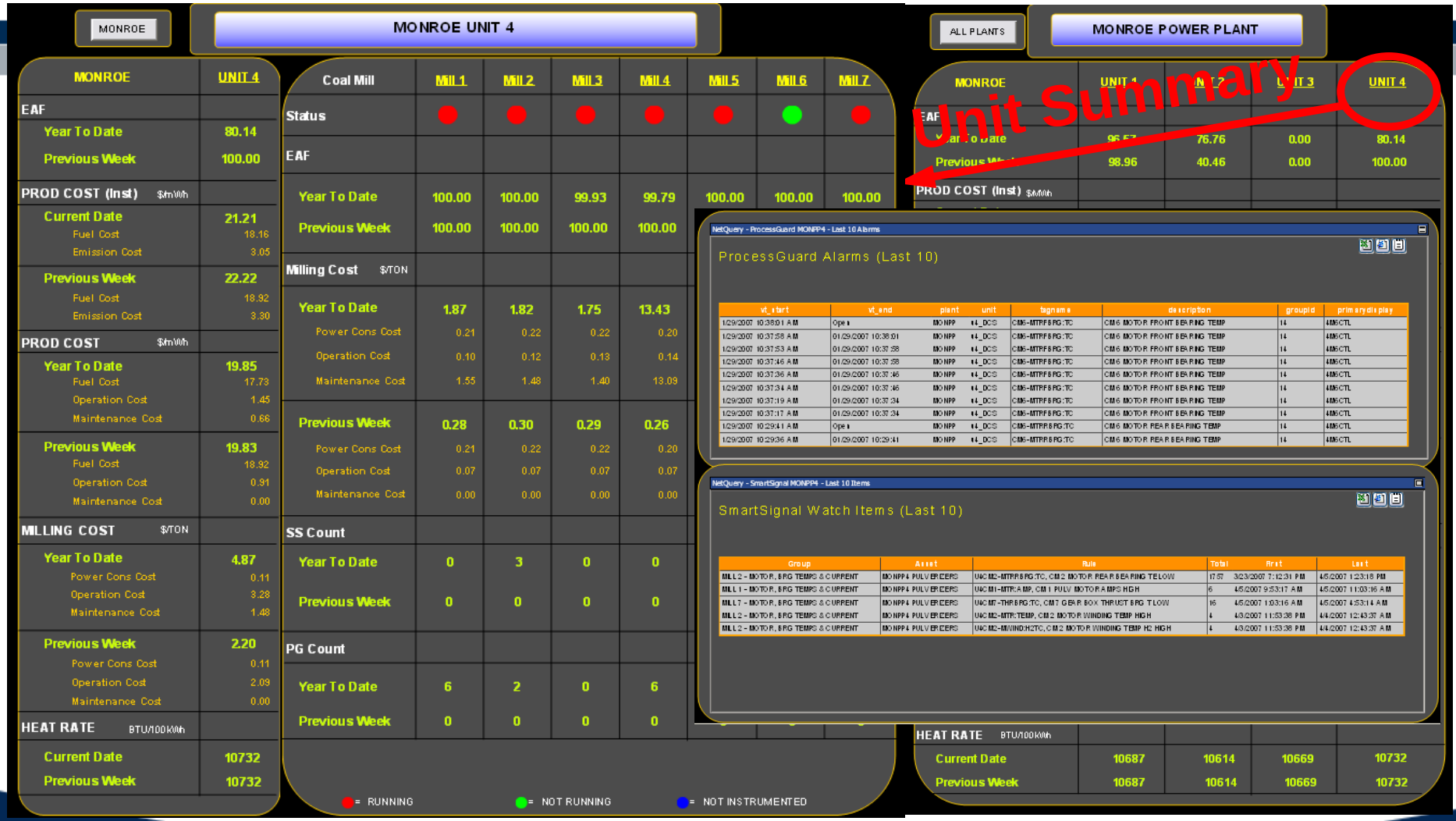
Performance Center – Vision

Fossil Generation’s Fleet-wide “**Mission Control Center**” for continuous monitoring and optimization of plant equipment performance



- Located in Ann Arbor Michigan
- 7x24 hour operation (February 2006).
- Plant interface with Merchant Operation Center.
- Oversight of Outage and de-rate coordination.

Process Cost Drill Down



Additional Value Realized by Enterprise Infrastructure

- Entergy - $8 for every $1 spent on Centralized M&D Performance Center
- Calpine - $9 Million USD saved in 8 months by optimizing fuel
- RWE nPower – Reduced cold starts from 16 hrs to 8 hrs, reducing costs by 33%
- Reliant – Saved $2.26 Million USD by reducing forced outages
- Reliant – Converted FO to PO saving $1.6 Million USD
- PSE&G – Saved $300,000 in maintenance cost in 1 year via CBM

Summary Benefits of Enterprise Infrastructure

- Provides a layer of normalization for varying types of assets
- Reduces total cost of ownership
- Improves standards
- Provides a platform for value added systems and applications
- Facilitates greater systems integration and knowledge transfer

Questions

Thank You