



**Tivoli** software



Real Estate and Facilities



Plant and Production



Mobile Assets



Infrastructure



Information Technology

# Operational Intelligence for Smart Asset Management

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# Agenda

- Smarter Assets are appearing everywhere
- Why the need for more information
- The Flood of data
- IBM providing the Tools of the Trade
- How to use this information
- Examples of operational intelligence solutions

# Smart Assets are everywhere



Smart Meters



From this



To this



Thermostats



Home PC



Smart Appliance Controllers



In home metering devices

# Asset management is more than just breakdowns, parts and PM plans.

it's not just about the asset...



...it's about the service the asset provides, and about aligning the service with the business

# Why the Need for more information

- What happens if this asset experiences an unplanned outage?
- What other assets will be put at risk?
- What services will be affected?
- Which customers will be affected?
- SLA's
- Customer and market perceptions
- Will the failure have an environmental impact?
- Compliance?
- Revenue?
- Can the assets continue to deliver in the long term?





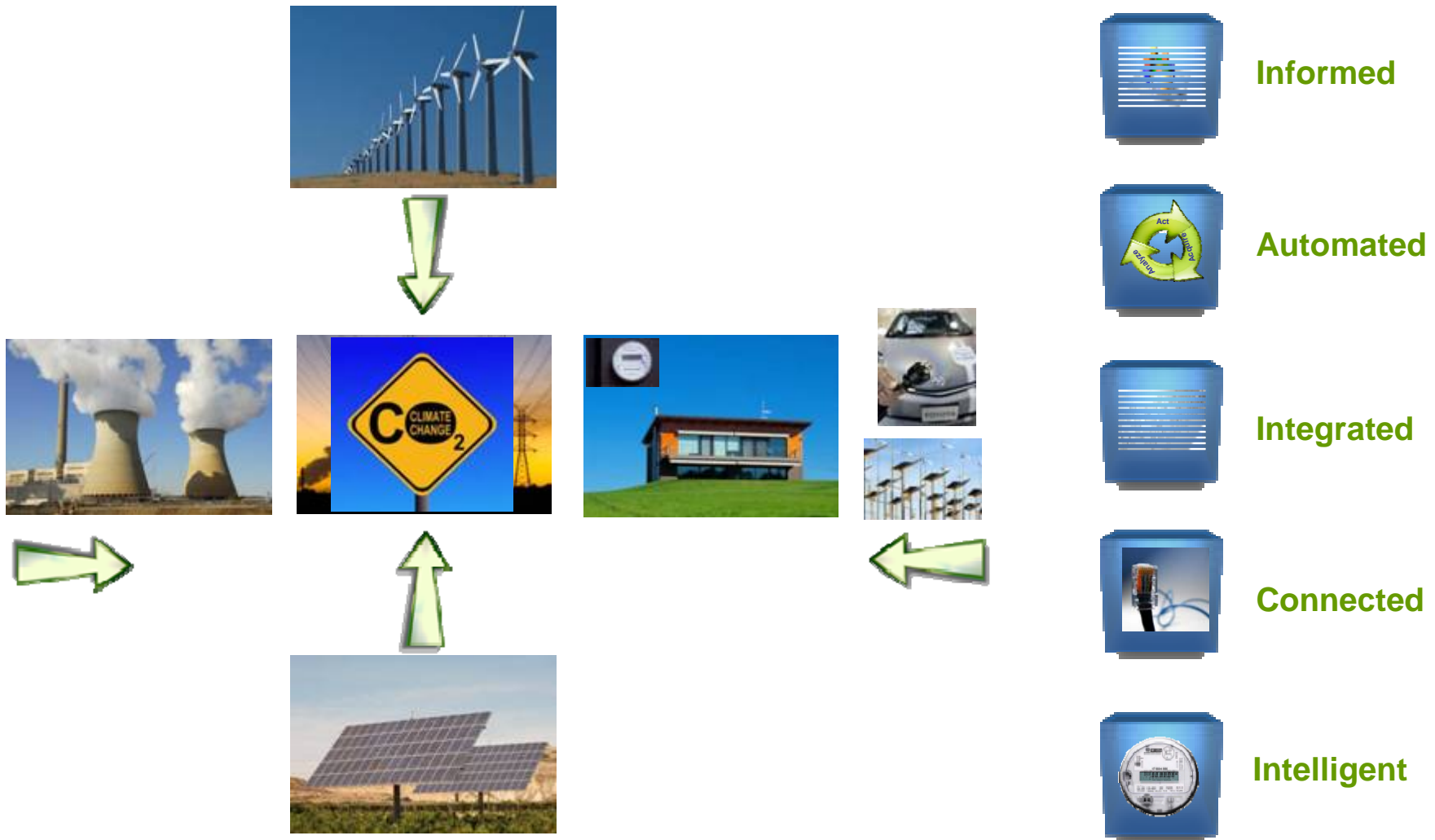
# The Flood of Data

- Asset Condition
- Asset location
- Dependency / connectivity
- Customer demand / consumption at the meter
- Service address
- Asset event history
- PM schedules
- Age
- Capacity
- Asset Configuration
- Emissions data



***Most of you already have this data in your organisation***

# Operational Intelligence & Smart Asset Management is more than just sensors and smart meters



# IBM Maximo Core Enterprise Asset Management

## Asset Management

- Locations
- Asset
- Failure Codes
- Conditioning Monitoring
- Meters
- Meter Groups
- Classifications / Specifications

## Work Management

- Job Plans
- Routes
- Service Items
- Work Order Tracking
- Failure Reporting
- Safety
- Quick Reporting
- Labor
- Qualifications
- Lock-Out / Tag-Out
- Tools / Crafts / Companies
- Preventive Maintenance
- Master PM
- Assignment Manager

## Materials Management

- Item Master
- Storerooms
- Inventory
- Lot Management
- Kitting
- Issues & Transfers
- Condition Codes
- Stocked Tools
- Service Items
- Classifications / Specifications

## Purchasing

- Request for Quotation
- Receiving
- Receiving Inspections
- Purchase Requisitions
- Invoices
- Purchase Orders
- Desktop Requisitions

## Contract Management

- Purchase Contracts
- Master Contracts
- Warranty Contracts
- Lease / Rental Contracts
- Labor Rate Contracts
- Payment Schedules

## Service Management

- Service Catalogs
- SLA Management
- Service Requests
- Incidents
- Problems
- Changes
- Releases
- Solutions
- Ticket Templates

Enhanced Workflow in SLAs and Escalation Manager

Configuration – UI, Database Fields, and Applications

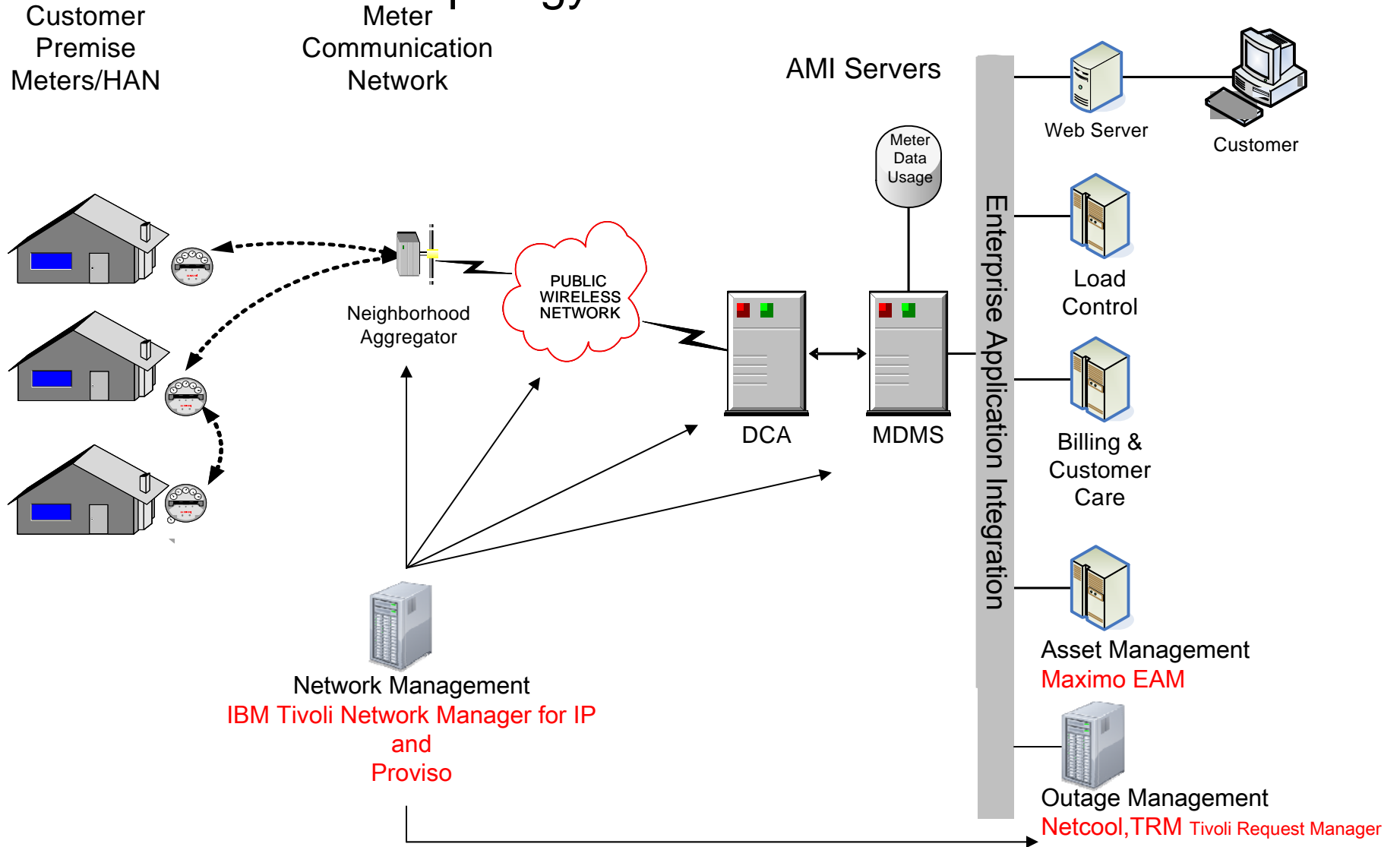
Maximo Integration Framework (MIF) – Native Integration Capabilities

KPIs / Reporting / Analysis

Security & Administration



# AMI Topology with Tivoli Solutions



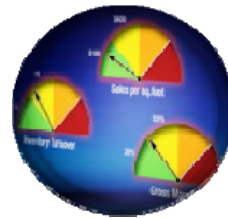
# IBM Solution for EAM spans the enterprise

## *Linking business and IT to enable new capabilities*



### Asset, Device and Service Monitoring

Visualize infrastructure availability and performance through device, event and usage data, providing real-time control and analysis to speed time to resolution.



### Asset Lifecycle Management

Track, document and make decisions about the procurement, deployment, operation, maintenance, and disposal of generation plant, transmission or distribution field assets.



### Informed Decision Making

Use data and information aggregated from business and operation systems to analyze events, develop insights, correlate reactions to change, to improve business flexibility and performance.



### Improved Customer Experience

Deliver convenient, personalized customer experience, by enabling interactive communication and providing consumers more control of their energy sources and usage.



**Business Process Automation** Model, manage, and optimize business processes resulting in faster time to market, increased customer satisfaction, and higher productivity.



### Governance, Risk & Compliance Management

Manage large quantities of utility documents and processes to comply with government mandated regulations



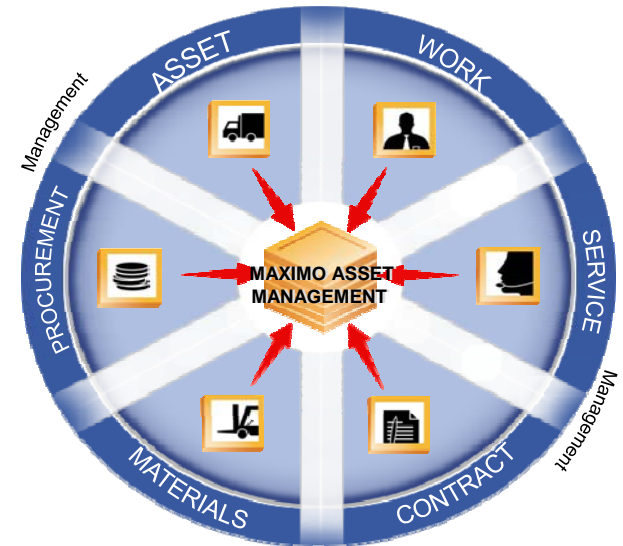
### Security Solutions

Comprehensively manage and prevent security risk across all business domains

# IBM Maximo Asset Management

Helping you eat the information management elephant

- Incorporate data capture activities into everyday tasks
- Add data capture fields as required in a staged manner
- Define your own condition and criticality codes
- Identify how the asset is being utilised (rankings/ratings)
- Set up your meters as assets
- Load you fuel card data, ask for electronic electricity and gas bills
- Use Standing work orders for operational data and cost/revenue collection
- Use Automated data analysis and workflow tools to create actions in real time
- Provide a portal for your customers to record asset status and condition assessments



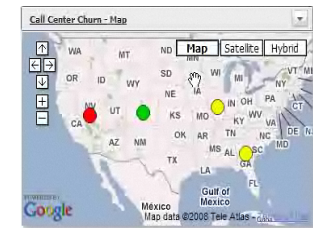
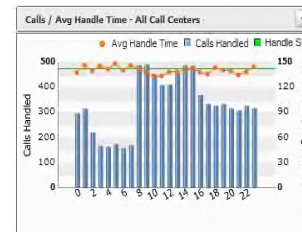
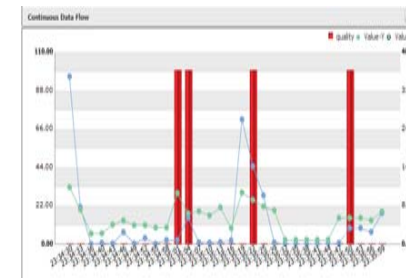
## How to use this information

- Environmental compliance, NGER, CPRS reporting, ETS (when it arrives ... someday)
- Safety compliance – what procedures were conducted, when, how, why
- Service levels compliance – response times, levels of service, regularity
- Identify customer behavior and consumption patterns
- Total cost of asset operations, maintenance, operations, environmental, funding other indirect costs
- Cost per unit, per sqm, per tonne etc.
- Create a P&L for major assets – eg. Facilities, production unit, per vehicle
- Capital renewal cost forecasting

# How to use this information

## Identify

- Assets that may impact on your revenue
  - Asset Criticality
- What types of failure influence your capacity to deliver
- Which customers are critical to your business
  - Required Service levels



**Adopt a strategic approach to Reliability Centered Maintenance**



# Examples of Smart Asset management

# DTE Energy

Unlocking synergy and gaining flexibility with common, integrated business processes

“Our goal was to establish a platform for DTE Energy to thrive in a dynamic and challenging environment. We achieved our key objectives of integration and modernized our technology. We think IBM products and their integration were keys to our project’s success”

– Ron May, Senior Vice President, Major Enterprise Projects, DTE

## Solution Components

- IBM DB2®
- IBM Global Business Services
- IBM Maximo Asset Management®
- IBM System p™
- IBM WebSphere® Enterprise Server Bus

Challenges	Solution	Benefits
<ul style="list-style-type: none"> <li>▪ With the utility business becoming more competitive by the day, Midwestern energy giant DTE Energy needed to position itself for the future. Disparate systems and process fragmentation across nearly 200 different business units prevented the company from realizing all of the underlying synergies from acquisitions</li> </ul>	<ul style="list-style-type: none"> <li>▪ With the help of IBM, DTE Energy undertook a massive consolidation of its business systems, which made possible the complete redesign and standardization of processes across all business units. Using SOA technology, DTE Energy was able to consolidate all of its highly diverse businesses under one core business platform, and can now drive optimization efforts as an enterprise — not a collection of business units</li> </ul>	<ul style="list-style-type: none"> <li>▪ Projected US\$75 million in annual operating cost savings</li> <li>▪ Improved decision-making through increased transparency across business units</li> <li>▪ Unified access to inventory availability across all businesses</li> <li>▪ Improved ability to share and implement best practices across the enterprise</li> </ul>

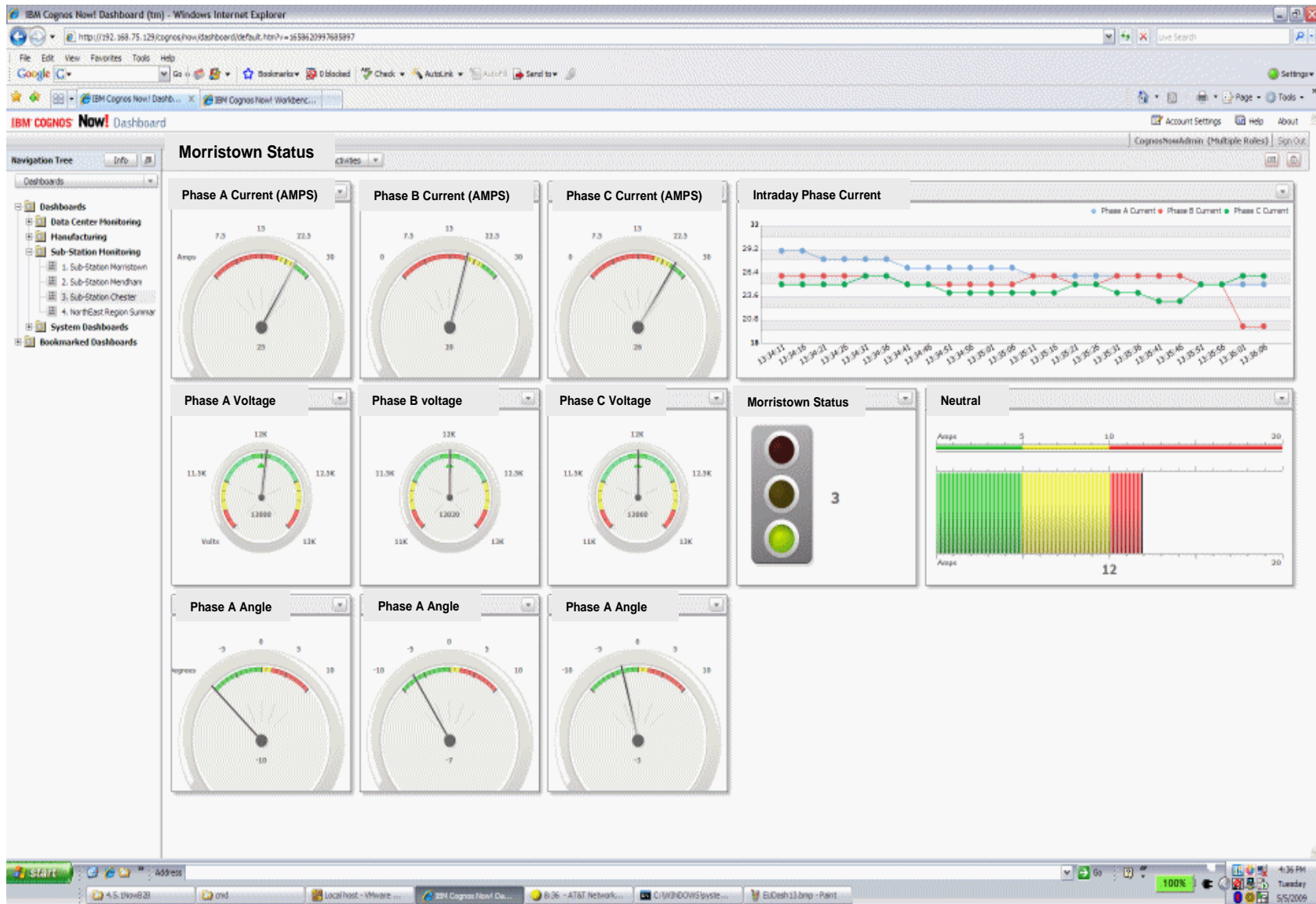
## iLogic Pumped Storage Optimization at DTE

***Business Problem – Maximize market impact of Detroit Edison's Ludington Pumped Storage Plant by optimizing its operating schedule to Midwest Independent System Operator (MISO) market signals***



- Input Variables
  - Market Price forecast
  - Reservoir capacity
  - Unit generation and pumping capacity
  - Generation and pumping efficiency
  - Reversible turbines cannot start in pumping mode above certain reservoir level
  - Limit on pumping sessions: only once a day
  - Unit availability
  - Unit startup interval & ramp rate
  - Initial and final reservoir levels for the period of analysis

# IBM Cognos – Sub-station Monitoring Dashboard



# IBM Cognos - Operations KPI dashboard





### Navigation

Select:

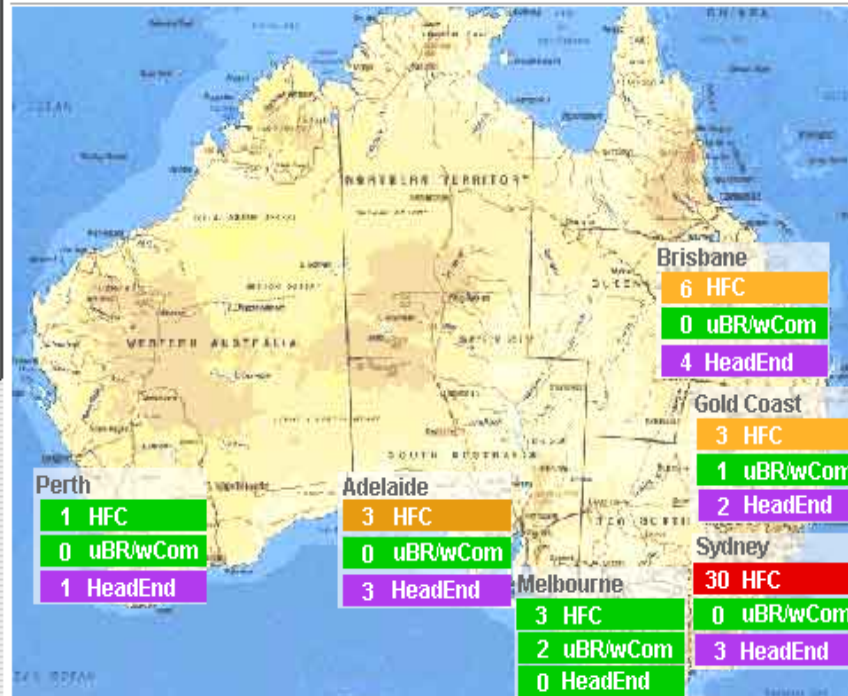
- Home
- My Desktop
- NBOC Home
- DHOC Home
- MCC Projector
- Filter Sets
  - MCC
  - BCO
    - QLD Cable
    - QLD Digital
    - LOTV Cable
    - LOTV Digital
    - HOTV Cable
    - HOTV Digital
    - FLNH Cable
    - FLNH Digital
    - PIEH Cable
    - PIEH Digital
  - BigPond Ops
  - BCNM Support
- Support
- Links
  - uBR/wCOM Tool
  - Cable Modem Tool
  - BCNM Reporter
  - Fastwire
  - Micromuse

Show Modems



### National Broadband Operations Centre: Operational View

#### HeadEnd Status:



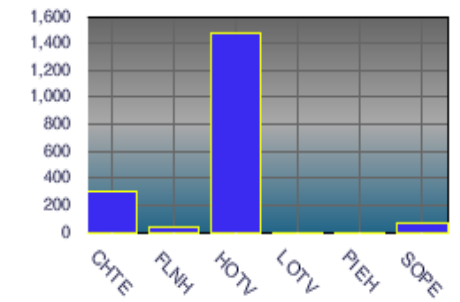
#### Recent Events:

Head End	Node	Summary	Last Occurrence
HOTV	192.168.8.94	Node Offline: BBEA (BONDI SPLITTER N10) ( 13 Hub Offline Alarms)	17/03/05 10:59:09
HOTV	192.168.8.94	Hub Offline: BI07 (BONDI HUB NO7) (trigger: 43 Modems Offline)	17/03/05 10:59:06
HOTV	192.168.8.94	Hub Offline: BI10 (BONDI HUB NO10) (trigger: 37 Modems Offline)	17/03/05 10:59:06
HOTV	192.168.8.94	Hub Offline: BI13 (BONDI HUB NO13) (trigger: 32 Modems Offline)	17/03/05 10:59:06
HOTV	192.168.8.94	Hub Offline: BI09 (BONDI HUB NO.09) (trigger: 57 Modems Offline)	17/03/05 10:59:05
HOTV	192.168.8.94	Hub Offline: BI11 (BONDI HUB NO11) (trigger: 30 Modems Offline)	17/03/05 10:59:05
HOTV	192.168.8.94	Hub Offline: BI01 (BONDI HUB NO1) (trigger: 72 Modems Offline)	17/03/05 10:59:05
HOTV	192.168.8.94	Hub Offline: BI08 (BONDI HUB NO8) (trigger: 44 Modems Offline)	17/03/05 10:59:05
HOTV	192.168.8.94	Hub Offline: BI03 (BONDI HUB NO3) (trigger: 57 Modems Offline)	17/03/05 10:59:05

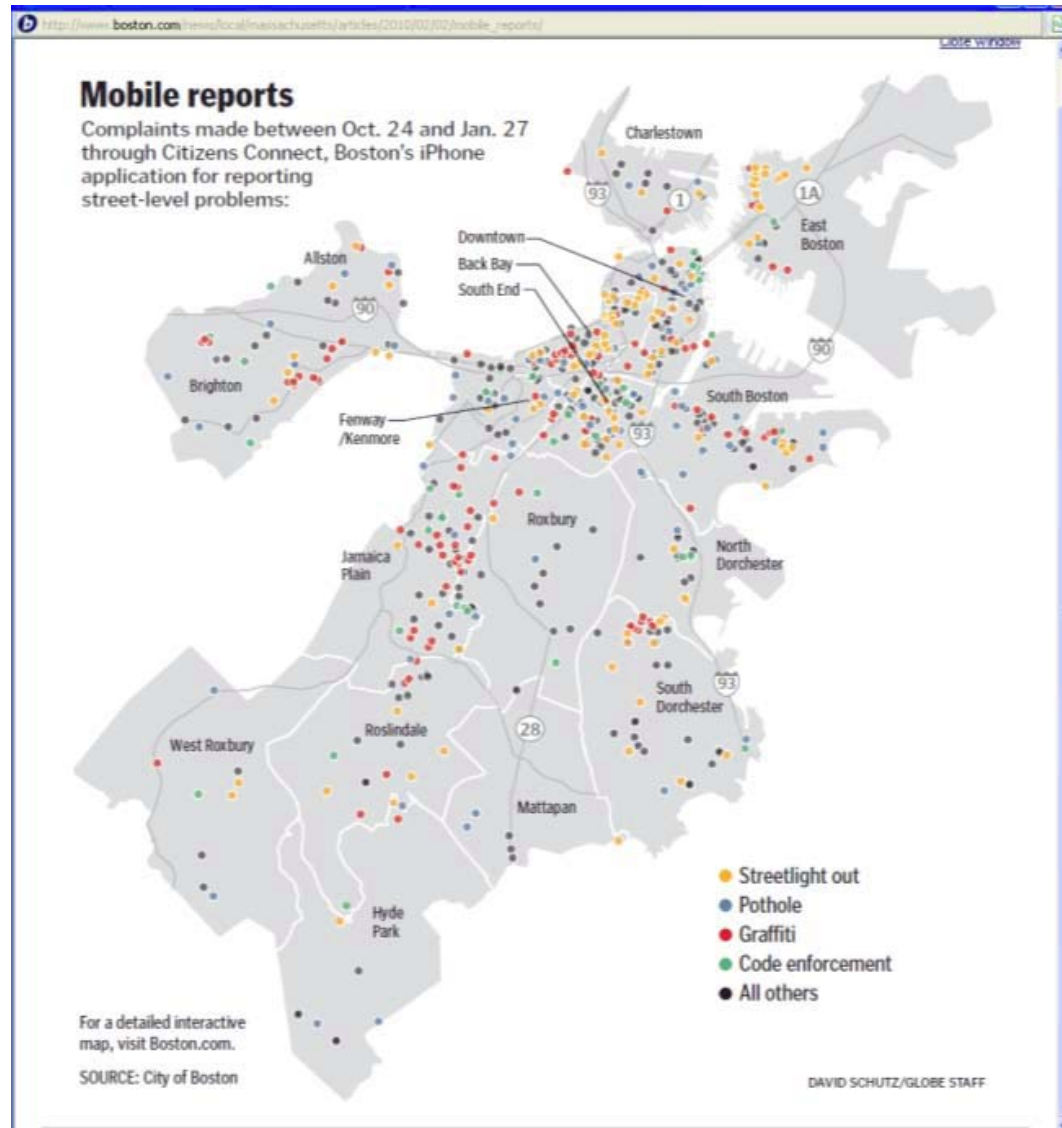
#### HFC SLA Status:

	30m	> 6h	> 8h
HOTV	0	0	0
LOTV	0	0	1
QLD	0	0	4
PIEH	0	0	0
FLNH	0	0	1

#### BigPond Cable Customers Offline:



# IBM data analysis and GIS portals



# Consolidated Edison of New York

- Key Business Requirements
  - Manage and maintain their electrical transmission and distribution network buried under the streets of New York City
  - Manage the interactions with the city to obtain permits to obtain access to their assets and close streets as required
- Approach
  - Create a “Mobile Office” to supply their field workers with information
  - Cooperatively build processes to obtain emergency permits from the city



## Challenges

- **ConEd inspectors didn't have access to all the information they needed to manage work being performed in the field**
- **The permit process wasn't organized resulting in fines from the city for alleged violations**

## Solution

- **Empower inspectors with all the tools they needed to capture information and access needed documents**
- **Create a process to obtain permits and embargos for work to be performed**
- **Management processes to track job status against permits**

## Results

- **Inspectors spend more time in the field and less time in the office doing paperwork**
- **Fines have been substantially reduced**
- **Eliminate delays in work due to lack of information**
- **As Built configurations captured**

# IBM Smart Grid Solutions



Making data the latest tool for the technician