




IBM and water management



OC WATER SUMMIT
May 15th 2009

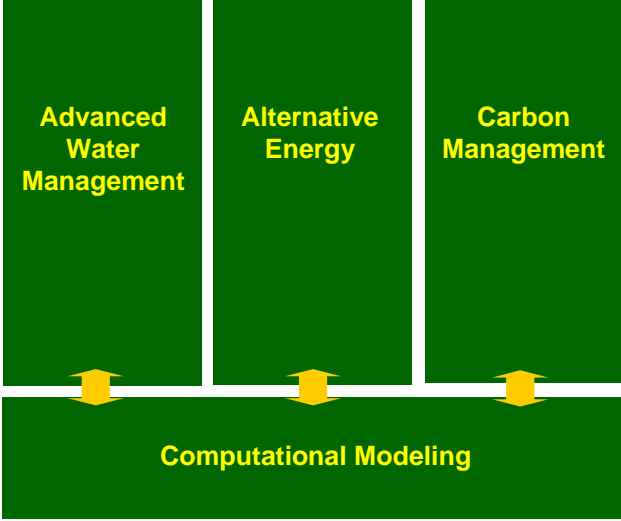


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Big Green Innovations 2

Big Green Innovations' portfolio has four core areas




Advanced Water Management

Alternative Energy

Carbon Management

Computational Modeling




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Big Green Innovations 3

For water, we work at three “scales”

Natural scale

- Water resource mapping and availability
- Water quality monitoring and management (surface and subsurface)
- Land use analysis
- Extraction monitoring (surface and subsurface)
- Flood control






Utility scale

- Water quality and usage
- Discharge, combined sewer overflow
- Asset management
- Energy management
- “Smart levees” and monitoring systems
- Weather event assimilation
- Flood control

Enterprise Scale

- Water usage tracking
- Water quality control (into and within plants, discharges)
- Supply chain optimization
- Energy management
- Business process improvements
- Metrics and management



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Enterprise level - water is a source of risk

(Source: synthesized from World Resources Institute, quoted in JP Morgan, “Watching Water”, April 14 2008)


Risk	Impact
Physical	<ul style="list-style-type: none"> ▪ Disruption from non availability ▪ Temporary suspension of supply - disruption to operations ▪ Scarcity drives up prices ▪ Increased need for capital spend on extraction, treatment ▪ Competition for scarce resources limits growth
Regulation	<ul style="list-style-type: none"> ▪ Suspension of own supplier’s license or discharge permit disrupts supply or manufacturing ▪ Reallocation to more urgent needs during drought disrupts operations
Reputation	<ul style="list-style-type: none"> ▪ Competition with household demand limits growth, or damages reputation ▪ Increased need for capital spend on wastewater treatment ▪ Brand damage directly, or by association with suppliers’ pollution or water use

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IBM Burlington, VT, by the numbers

- Energy: 65MW peak (> the city of Burlington)
- Ultra Pure Water: 3.24 MGD Capacity
- Potable Water: 6.0 MGD Capacity
- Waste Treatment: 3,200,000 Gallons per Day
 - Primary/secondary treatment, special industrial waste treatment - directly discharges to river
- Cooling: 35,000 hp, >50,000 gpm cooling water
- Environmental Protection Magazine Award
 - Outstanding IWTP Facility of the Year Award
- Green Mountain Water Environment Association
 - Outstanding Industrial Waste Treatment Facility Award
 - Outstanding Industrial Waste Operator Award
- VT Governor's Award 2009
 - Environmental Excellence in Environmental Stewardship/Resource Protection



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Big Green Innovations 6

Water measurement & control systems

- Sensors for key water parameters
 - Flow, temperature, pressure, organics, metals, particles, dissolved gasses etc
- Laboratory analysis if sensors not available or impractical
- Data collection
 - SCADA system
 - 5000 discrete & analog points
 - PLCs, data networks, archiving
 - Scan rates – 600 msec, 400m data packets/day
- Monitoring and control -
 - PLCs for real time process control and monitoring
 - SCADA nodes, alarming
- Data Analysis
 - Trending, correlation
 - Statistical process control – 80 points

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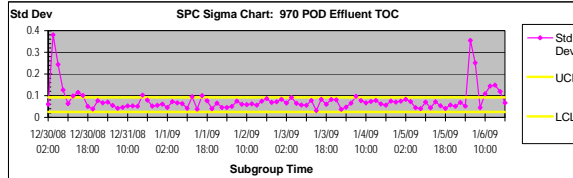
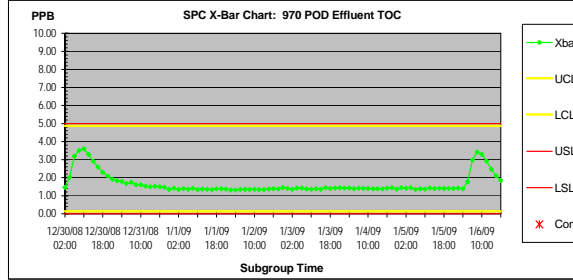
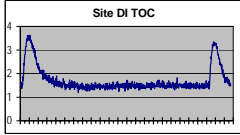
Water measurement & control systems (cont'd)

970 POD Effluent TOC

X-Bar S Chart, 8 Day

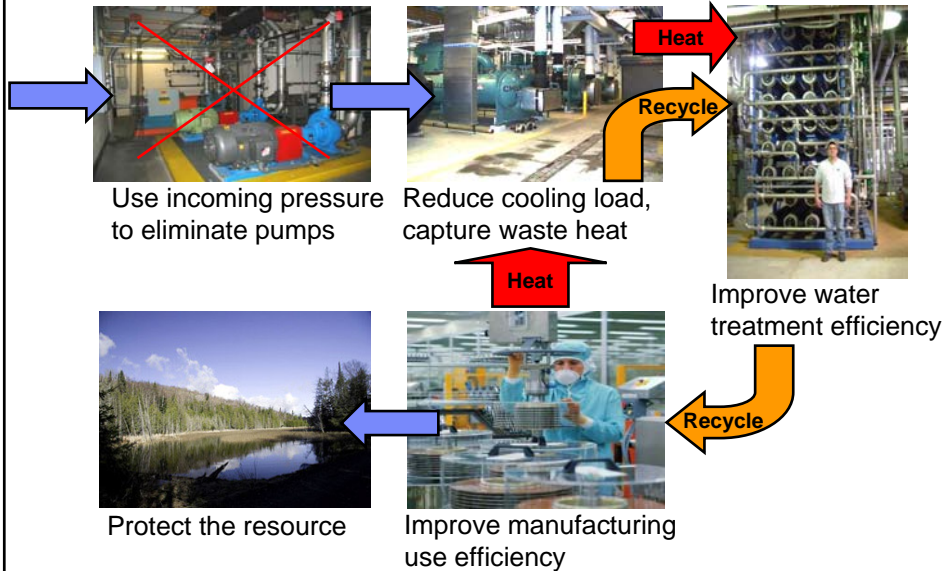
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End Date: 1/7/2009
Method: Modified Control Limits
Data: 96 subgroups of 15 samples, 8 min. rate
Status: Operations

970 POD

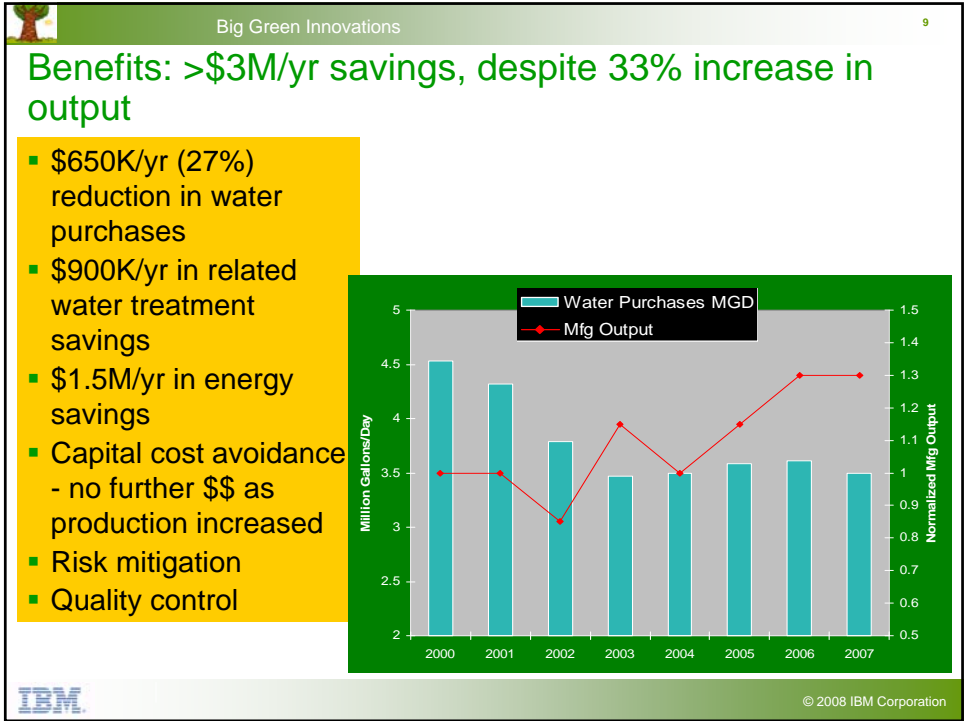


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Energy & water management



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Big Green Innovations 10

Proposal for Water Innovations Alliance - to educate the water industry on the value, and effective use of, advanced IT

- **Articulate a vision** of how advanced IT will benefit water management
- **Create supporting collateral** - reference architectures, ROI tools, data and modeling standards, etc and work for adoption
- **Sponsor & stimulate pilots** for:
 - Wide-scale sensing, advanced analytics and visualization
 - Data and model integration on the scale of the water resource being managed
 - Multi-agency collaboration
 - (Supported with Federal funding)
 - Sustained collaborative change
- Educational focus

- Federal, state and local agencies
- Water industry associations
- Universities
- Water users
- Water industry vendors - engineering, IT, equipment, other

Interested? Contact peter.r.williams@us.ibm.com

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Thank you!

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