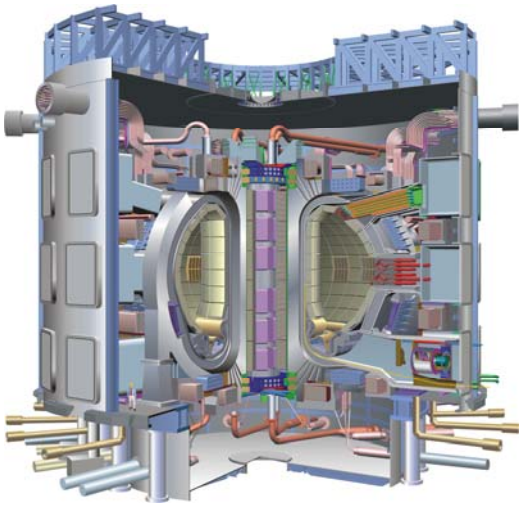
IBM Global CEO Study

The Utility of the Future
Product Lifecycle Management Leads the Way



Abstract

Never has energy and the role of utilities been such a strategic concern as it is today. Diminishing sources, increased demand and aging infrastructure is driving utilities to totally rethink how they will become more productive and meet the growing demand. For some companies, this means increasing efficiency or extending the life of existing facilities. For others, it means totally new plants, some with totally new technologies.

The 2008 IBM Global CEO Study is based on interviews with CEOs and organization leaders and in-depth analysis of the resulting data. The CEO Study focuses on the effects of three developments on organizations:

- *New and changing customers – changes at the end of the value chain*
- *Global integration – changes within the value chain*
- *Business model innovation – the business response to these changes*

This booklet highlights the findings of the CEO Study and provides examples of how utility customers use Product Lifecycle Management (PLM) technology to solve problems identified by the study. We hope you find this report informative from a business issue perspective as well as the potential contribution PLM can make to your company.

Contents

Scope

Company CEOs or major company division leaders (78%) and senior public sector leaders (22%) with a representative sample across geographies and sectors which included:

- 31% in Americas, 36% in EMEA, and 33% in Asia
- 80% in Major Market countries and 20% in Growth Market countries

Organization Size:

- Companies with annual revenue of over $500Mn in Major Markets and over $250Mn in Growth Markets
- Public sector organizations with over 1,000 employees

Approach

Interviews were conducted with 1,130 CEOs and leaders worldwide:

- One hour interviews using a structured questionnaire
- Includes 29 interviews of E&U company CEOs (electric, gas, and combined)
- Analyzed the results from both a quantitative and qualitative perspective

IBM PLM

IBM is a leading provider of software, services, and hardware to the utility sector. Product Lifecycle Management solutions are built on Dassault Systemes brands CATIA®, ENOVIA®, DELMIA® and 3DVIA® as well as IBM components from Tivoli® Maximo® Asset Management, PLM Lab Services and Collaborative Product Innovation consultancies. IBM research, high performance computing and financial services provide additional customer support.

IBM PLM solutions deliver business value to energy customers in four critical areas:

- *Capital Project Collaboration*
- *Construction and Maintenance Planning and Optimization*
- *Engineering Asset Management for Maintenance*
- *Plant Design, Equipment and Systems*

IBM Global Business Services

The Characteristics of The Utility of the Future

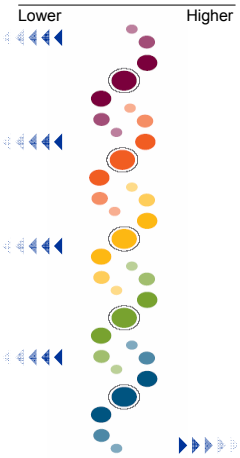
Innovate Beyond Customers' Imagination

"Keeping up with the real-time needs and expectations of consumers will grow exponentially in the electric business over the next 3 years."

- North American utility executive

Utilities CEOs recognize that disruptive innovation is required, but they are concerned about their ability to manage change

Focus: Utilities versus All Global*



- **Hungry for Change**: Almost 70% of utility CEOs see substantial change as inevitable over the next three years, dominated by environmental and regulatory issues; there appears to be decreasing confidence in their ability to manage the changes
- **Innovative Beyond Customer Imagination**: About two in three utility executives see more informed and collaborative customers bringing positive changes to their business, and spending on customer relations and programs is ramping up in advance, especially in new products and services and new business relationships
- **Globally Integrated**: Utility companies see the world much more locally than CEOs in most other industries, but the globalization of the supply chain is an underleveraged strategic dimension
- **Disruptive by nature**: Business model innovation is less applied by utilities than any other large industry; while this has a reasonable historic basis, customer and technology forces will force an intense focus on this in the very near future
- **Genuine, not just generous**: Utilities are well ahead of most other industries on investment related to environmental initiatives; communicating corporate social responsibility actions is an effort that is now receiving more attention and focus

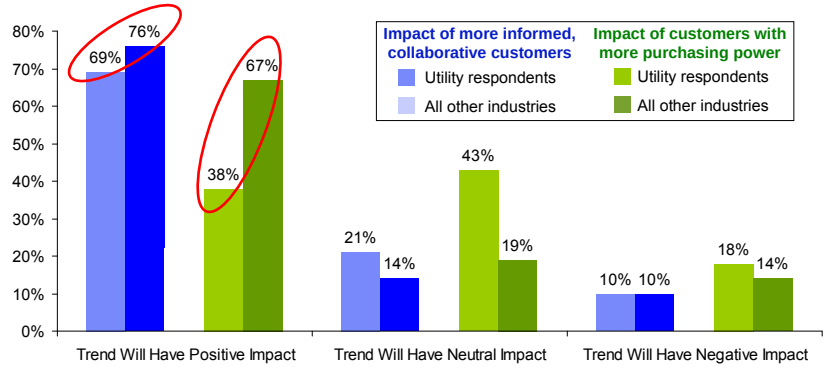
Source: IBM Global CEO Study 2008

* Arrows to the left (right) indicate utility focus is less than (greater than) global, all-industry sample

INNOVATIVE BEYOND CUSTOMER IMAGINATION

Customers are becoming more informed, and utility executives view this nearly as positively as their peers across all industries

CEO expectations of the impact of changing customers on their business



But they are much less certain about being able to benefit from the impact of consumers' increased spending power

Source: IBM Global CEO Study 2008

INNOVATIVE BEYOND CUSTOMER IMAGINATION

Customers' imaginations about what they want from energy providers will be shaped by control and options available in other parts of their lives…

Decision-Making Initiative Taken: Low (Traditional Consumer) → High (Active Consumer)

Media Consumers	Energy Consumers
Passive receipt of content, with limited sources of content generated by major media companies	Passive receipt of power, with limited sources of generation controlled by incumbent utilities
Consumer interest drives new and more targeted choices in content, and broader choice of providers drives more active role in provider selection	Consumer interest drives new and more targeted choices in power supply (e.g., green energy) and broader choice of providers drives more active role in provider selection
Dynamic, value-based pricing of content; provider-customer relationship dynamic is customized to specific entertainment and information interests, with consumer analytics a key driver	Dynamic, value-based pricing of power (e.g., time-of-use); provider-customer relationship dynamic is increasingly customized to specific energy management goals, with consumer analytics a key driver

Time – Industry Evolution

"We do expect revolutionary change around customer centricity issues."
- CEO, large electric retailer

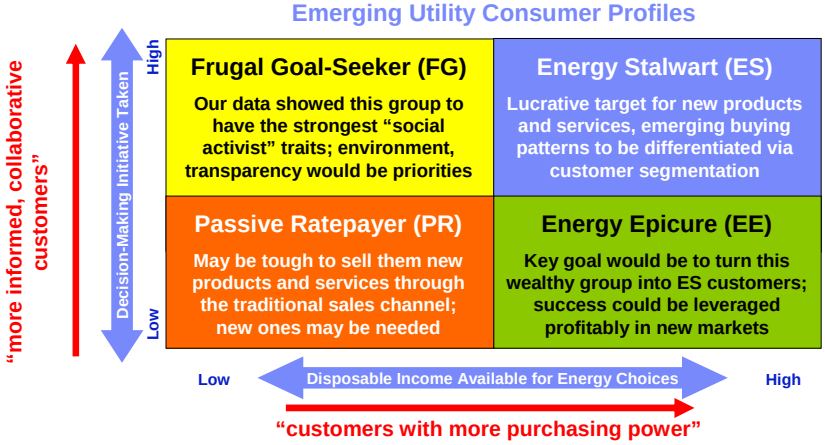
This will drive a shift from the traditional utility-controlled relationship with ratepayers to a more customer-driven experience

Source: "Plugging in the consumer: Innovating utility business models for the future," IBM Institute for Business Value, 2007; IBM Global CEO Study 2008.

INNOVATIVE BEYOND CUSTOMER IMAGINATION

... which, in combination with technology that enables more control over energy decisions, will lead to new and more profitable customer segments

Emerging Utility Consumer Profiles



More details on these profiles can be found in the 2007 IBM Institute for Business Value paper Plugging in the consumer: Innovating utility business models for the future

Source: "Plugging in the consumer: Innovating utility business models for the future," IBM Institute for Business Value, 2007; IBM Institute for Business Value analysis..

INNOVATIVE BEYOND CUSTOMER IMAGINATION

Innovating for Customers by the Utility of the Future

How do customer demands drive innovation by the Utility of the Future?

- Utilities are relatively confident that the engaged, collaborative customer will bring positive benefits to the business
- Those CEOs most optimistic about this trend believe that introducing new products and services, forming new business relationships, and leveraging new consumer segments will be the keys to higher revenues from customers with more purchasing power
- Energy consumers are stratifying into groups based on their willingness to engage with the utility and their purchasing power; understanding these emerging segments and meeting their needs will depend heavily on analysis of new information flowing from the intelligent utility network
- Customers' views on what they expect from their utility providers will be shaped by the increasing levels of control and choice provided by other industries such as television

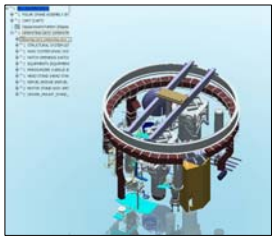
What actions will the Utility of the Future take to meet these challenges?

- Understand customer wants and needs – and how the expectations of various customer segments differ
- Provide customer segments with education and targeted programs that allow them to assume a level of control over energy decisions with which they are comfortable
- Develop the technologies and analytical capabilities needed to obtain customer intelligence and develop new products and services by leveraging information from the intelligent utility network

PLM Example: Entergy Corp.

The Company

Entergy Nuclear and its EquaGen LLC unit, own and operate the second largest nuclear fleet in North America with 11,022 megawatts of nuclear generating capacity, enough power for nearly 10 million homes. Entergy Corp. is the second largest nuclear power operator in the U.S. managing 10 commercial sites with a total of 12 reactors



The Challenge

Validate project schedule for reactor coolant pump (RCP) replacement at Waterford3 plant. Ensure Health and Safety of workers and plan removal and installation path of equipment in areas with tight clearance.

The Solution

Entergy implemented a combination of Dassault Systèmes technologies to model and simulate nuclear plant maintenance for these upcoming tasks, including CATIA for modeling the plant and DELMIA to simulate the actual project work. To ensure the team had accurate dimensions of the plant, Entergy used scanning and digital photogrammetry from Dassault Systèmes' partner Areva NP. BCP Engineers & Consultants served as the prime contractor for the projects.

The Benefits

Identify savings of 3-4 days of outage time and elimination of expensive physical mockup: ~$4.5M. Interference and potential clash detected during equipment removal in virtual environment. Created a safe, reliable and competitive plant operation.

The Characteristics of The Utility of the Future

Genuine, Not Just Generous

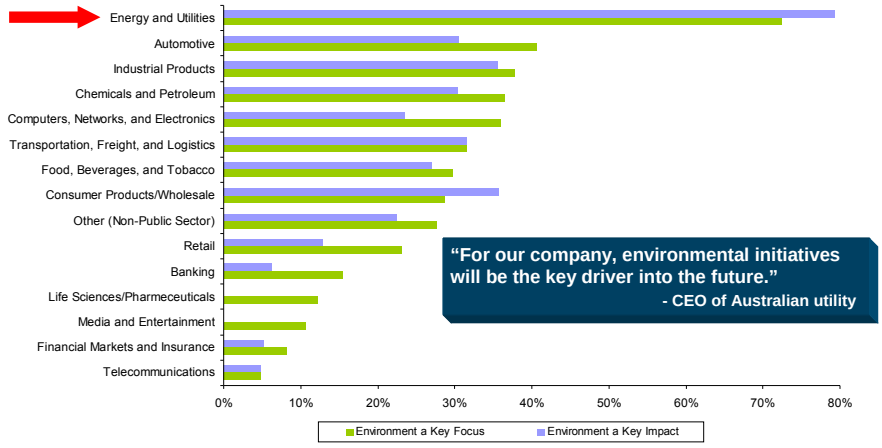
"That is critical - the whole issue of integrity, that we have the customer in mind."

- Executive of North American utility

GENUINE, NOT JUST GENEROUS

For utilities, the environment is the key to reputation on corporate social responsibility (CSR) to a far greater degree than for other industries

Comparative analysis by industry: Impact of environmental issues and focus on environmental programs, 2008-2011

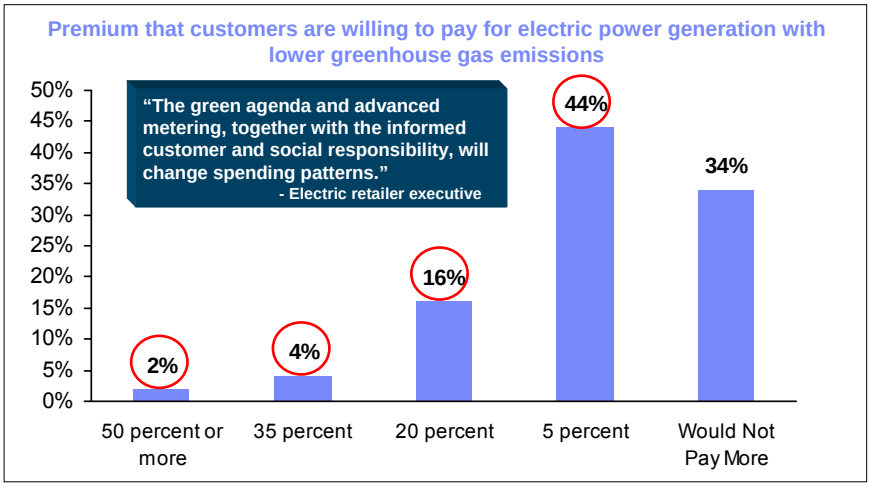


Source: IBM Global CEO Study 2008

GENUINE, NOT JUST GENEROUS

Despite increased costs, 76% of utility CEOs view CSR expectations as an opportunity for growth – primarily through new products and services

Premium that customers are willing to pay for electric power generation with lower greenhouse gas emissions



Source: 2007 IBM Institute for Business Value Consumer Survey

GENUINE, NOT JUST GENEROUS

Meeting minimum requirements has historically been sufficient – but more will be required as elevated attention is paid to corporate social responsibility

- Meet basic customer expectations for reliability, cost, and service
- Meet basic regulatory and legal requirements for compliance and transparency

- Understand customer/ stakeholder viewpoint on CSR issues, and raise the performance bar to try to meet those expectations
- Involve customers directly in business decision-making that directly impacts community

- Develop innovative products and services that meet specific CSR goals of customers, or partner with those who have these in place
- Assemble optimally profitable portfolio of CSR-focused products and services, ceding less profitable ones to other providers

- Work with stakeholders ahead of expected regulatory requirements on CSR solutions that benefit the community and the company's bottom line
- Secure leadership position across industry boundaries in proactively developing solutions addressing CSR concerns "ahead of need"

Source: IBM Institute for Business Value analysis

GENUINE, NOT JUST GENEROUS

Corporate Social Responsibility and the Utility of the Future

How does CSR impact the Utility of the Future?

- Corporate Social Responsibility is already important to a large majority of customers, and that focus will increase in coming years
- The climate change challenge has caught customers' attention and put utilities in the spotlight – but the industry's response has given the companies leadership status
- Customer focus on CSR presents new business opportunities for utilities…but also carries high expectations and new responsibilities
- Effective communication with stakeholders on actions that impact the community or the utility decisions and actions will be as important as the actions themselves

What actions will the Utility of the Future take to meet these challenges?

- Learn, understand, and proactively address the specific CSR expectations of customers and stakeholders, act to effectively and visibly meet those expectations, and clearly communicate both the actions and successes
- Give customers a more direct role in corporate decision-making, especially when decisions have a direct impact on the community
- **Develop innovative new products and services to meet the dual goals of good corporate citizenship and profitable growth**
- Develop solutions ahead of anticipated regulation to help bolster reputation and to find opportunities to shape final regulatory outcomes

PLM Example: Lawrence Livermore National Laboratory

"ENOVIA Engineering Central is at the core of our Enterprise Configuration Management System."

Bernie Merritt
NIF Configuration Management and Integrations Manager, Lawrence Livermore National Laboratory

The Laboratory

Lawrence Livermore National Laboratory (LLNL). a US Department of Energy R&D facility, pursues research projects ranging from energy independence and environmental protection to national and nuclear security. Backed by a wide variety of support disciplines, teams of scientists pursue technical innovations and scientific breakthroughs and help apply those discoveries to pressing, real-world challenges.

The Challenge

Manage the configuration of hundreds of thousands of documents and critical processes for multiple complex projects that can span decades; demonstrate responsible management of taxpayer resources.

The Solution

Dassault Systèmes developed an ENOVIA solution that provides LLNL's 1,600 users complete configuration management capabilities for all engineering, design safety, and compliance data and processes.

The Benefits

Throughput in handling engineering records increased six-fold; engineering changes processed five times faster; BOMs created automatically in ERP; bids and quotes that took a week to assemble are compiled in less than a day.

PLM Example: Pelamis Wave Power

The Company

Pelamis Wave Power Ltd. (PWP) is an Edinburgh-based company founded in 1998 to develop a novel offshore wave-energy converter called Pelamis. The Pelamis is a semi-submerged, articulated structure composed of cylindrical sections linked by hinged joints.

The Challenge

Pelamis Wave Power needed to extend its design analysis capabilities and be able to analyze "what-if" scenarios

The Solution

Dassault Systèmes supported Pelamis' adoption of SIMULIA for its finite element and non-linear analysis needs.

The Benefits

Thanks to SIMULA's sub-modeling and non-linear analysis capabilities, Pelamis Wave Power has increased the precision and reliability of its data and made the Pelamis wave energy converter safer and more environmentally sound.

IBM Global Business Services

The Characteristics of The Utility of the Future

Globally Integrated

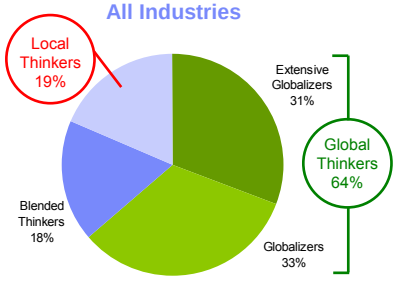
"Global integration has slowed due to slower regulatory change diminishing opportunity. The issue is whether to wait for opportunities to open up again, or target other opportunities now."

- Utility CEO, Asia

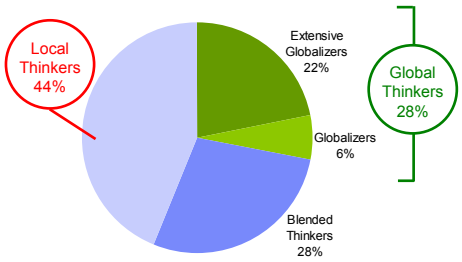
GLOBALLY INTEGRATED

Utility CEOs see their companies as primarily locally-focused, which differs from the view other industry CEOs have of their businesses

All Industries



Utilities



Extensive Globalizers
- Highly networked business, adopting a global approach to all elements of integration across multiple cultures

Globalizers
- Business which optimize globally, but already have the capabilities, knowledge and assets they need, and focus on a single culture

Blended Thinkers
- Trying to optimize through a mix of global and local approaches, with multiple cultures

Localizers
- Insulated business with a blended growth approach

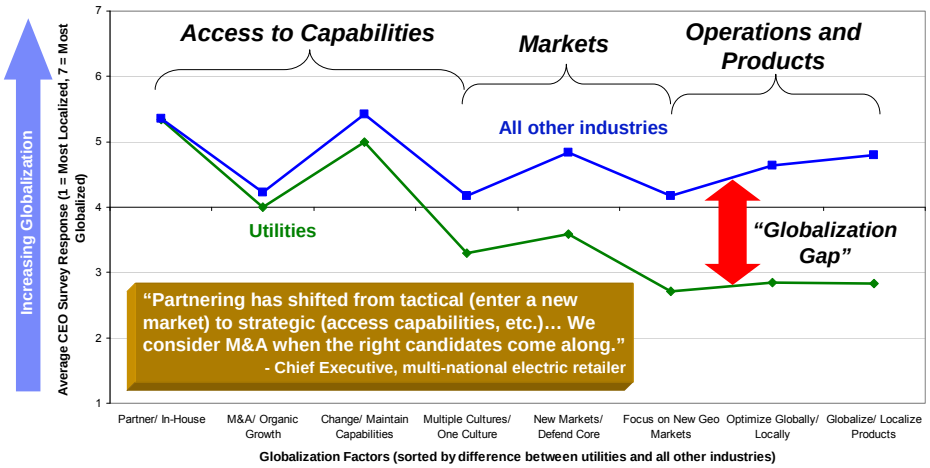
Only 3% of utilities said globalization was a key factor impacting their business vs. 35% across all industries

Source: IBM Global CEO Study 2008

GLOBALLY INTEGRATED

Utilities are similar to other industries in how they partner and collaborate globally, but much less so in how they operate and market products

Tendency toward globalization, utilities vs. all other industries



Source: IBM Global CEO Study 2008; IBM Institute for Business Value analysis

GLOBALLY INTEGRATED

Since globalization has broad implications for all business touchpoints, a more global view is beneficial even if the core business is localized

DOES IT IMPACT CUSTOMERS? ✓ YES

- Most industrial and commercial customers have a global focus, as evidenced by the 35% of non-utility CEOs that see globalization as a key impact

DOES IT IMPACT SUPPLIERS? ✓ YES

- The global nature of the fuels market is perhaps the most obvious, but competition for parts, equipment, financing, services, and talent is becoming fiercely global

DOES IT IMPACT COMPETITION? ✓ YES

- Within the industry, a growing number of emerging globally integrated utilities are setting roots in Europe, North America, and the Asia-Pacific region; this will create opportunities for new market entrants, uncover untapped potential for reducing costs, drive more aggressive M&A activity, and propagate new business approaches and models worldwide

DOES IT IMPACT REGULATION? ✓ YES

- In parts of the industry (e.g., nuclear power), effective regulatory actions have propagated rapidly across the globe; climate change may in time become the ultimate globalizer

DOES IT IMPACT INNOVATION? ✓ YES

- Best practices are already shared worldwide through industry and technical associations, the traditional trade press, and Internet resources; consortia and partnerships will play an increasing role in new technology and process deployment across generation, transmission, energy efficiency, and environmental impact

Source: IBM Institute for Business Value analysis.

GLOBALLY INTEGRATED

Globalization and the Utility of the Future

How does globalization affect the Utility of the Future?

- Most utilities are currently locally-focused because their value chain and core operations are generally not globalized, but this is changing
- Utilities already participate in global markets for supply chain items such as fuel, parts, equipment, financing, skilled workers, and professional services
- Regulatory, engineering, and technological best practices are more easily and rapidly shared than ever
- Multinational efforts to address climate change may increase the globalization of utilities as carbon constraints, taxes, or agreements cross national borders

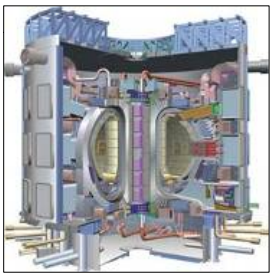
What actions will the Utility of the Future take to meet these challenges?

- **Recognize that key components of the supply chain are already globalized, looking beyond fuel to other key areas such as major capital equipment, expertise, financing, and professional services for opportunities to leverage global opportunities**
- Continue to focus on more localized value chain issues where appropriate, but begin developing a more global perspective in preparation for increasing competitive pressures from emerging globally-integrated utilities and the impact they will have on the industry
- **Understand the impact of globalization on key customers, and look for ways to use industry-specific expertise (e.g., environment, energy management) to create new opportunities with them**

PLM Example: International Thermonuclear Experimental Reactor

The Experiment

ITER is an international project to design and build an experimental fusion reactor based on the "tokamak" concept. It will be the world's largest fusion experiment and first to generate a sustained burning plasma. ITER will demonstrate the feasibility of nuclear fusion as an energy source. Complete plant construction on time and to budget.

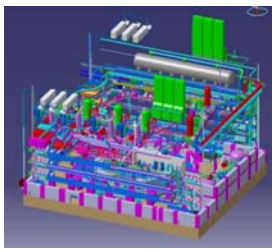


The Challenge

Orchestrate a pioneering international scientific research project via a small central team. There are more than 10 million+ parts with very complex interfaces in the reactor. High level of component integration required between mechanical design, plant design, construction, and maintenance. All design data needs to be easily accessible (40 years)

The Solution

Dassault Systèmes supported ITER's implementation of CATIA, ENOVIA VPLM and DELMIA solutions to engineer the reactor and plant, structure its design methodology, and ensure long-term data interoperability across the organization.



The Benefits

Deployed global design solution, single source database, and process simulation to 8 international organizations. Insure engineering quality and time savings, support concurrent design and international collaboration with global visibility.

IBM Global Business Services

The Characteristics of The Utility of the Future

Disruptive By Nature

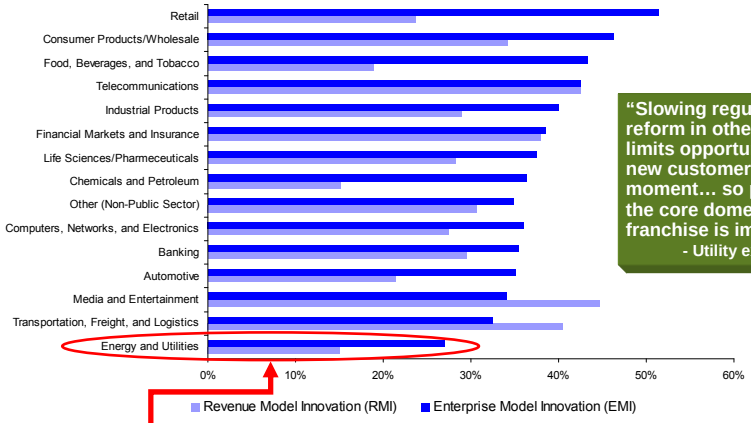
"There are profound opportunities to benefit from changes in the industry and how business models will be challenged."

- Electric utility CEO

DISRUPTIVE BY NATURE

Utilities' relatively low focus in business model innovation is consistent with the current state of most of the industry, dominated by traditional structures

Percent of CEOs reporting a strong focus on specific BMI areas



"Slowing regulatory reform in other markets limits opportunities for new customers at the moment… so protecting the core domestic franchise is important."

- Utility executive, Asia

Utilities least focused on both RMI and EMI vs. other industries

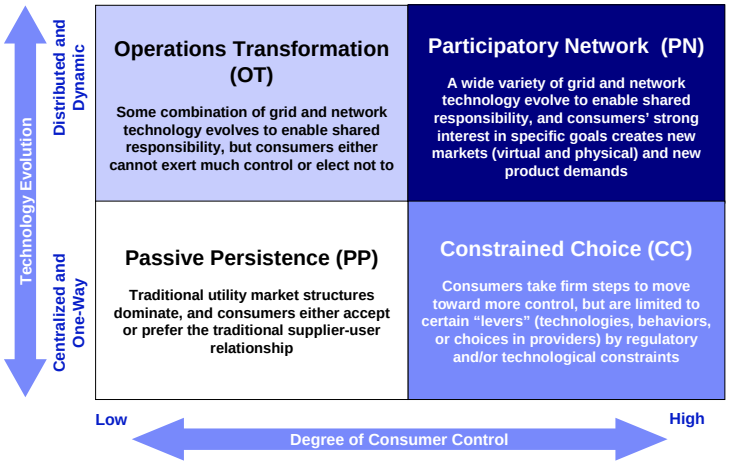
Utilities also ranked second-to-last in strong Industry Model Innovation (IMI) focus (11.5%)

Source: IBM Global CEO Study 2008

DISRUPTIVE BY NATURE

Four utility industry models will evolve over the next decade, determined by transfers of decision-making and deployment of advanced technologies

Utility Industry Models 2008-2018



Source: "Plugging in the consumer: Innovating utility business models for the future," IBM Institute for Business Value, 2007.

DISRUPTIVE BY NATURE

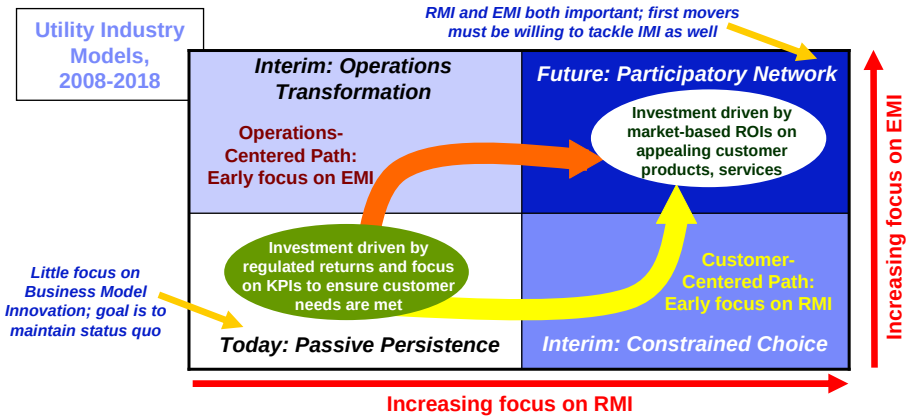
Three types of Business Model Innovation are highlighted in the 2008 CEO Study

- **Enterprise Model Innovation (EMI):** This approach involves innovation in the structure of the enterprise and the role it plays in new or existing value chains. This approach focuses strongly on leveraging enterprise assets, technology, and core competencies – often through collaboration or partnerships.
- **Revenue Model Innovation (RMI):** This approach involves innovations in how companies generate revenues by reconfiguring offerings (product/service/value mix) and/or by introducing new pricing models. This is a dimension that leverages customer experience, choices, and preferences.
- **Industry Model Innovation (IMI):** This approach involves innovation in the industry value chain through redefining an existing industry, moving into a new industry, or creating an entirely new one.

Source: "Paths to success: Three ways to innovate your business model," IBM Institute for Business Value, 2007.

DISRUPTIVE BY NATURE

As the Participatory Network develops and evolves, most utilities will move through interim business model innovations on the path toward it



Excellence will come from finding the right mix between renewing the business model and the operations processes."
- Utility CEO, Western Europe

Source: "Plugging in the consumer: Innovating utility business models for the future," IBM Institute for Business Value, 2007; "Paths to success: Three ways to innovate your business model," IBM Institute for Business Value, 2007; IBM Institute for Business Value Analysis.

DISRUPTIVE BY NATURE

BMI and the Utility of the Future

What needs for Business Model Innovation does the Utility of the Future have?

- The utility industry is likely to face substantial disruption across the entire value chain within a decade, but business model innovation is slow to take root
- Utility industry model transitions will require a much stronger focus on business model innovation in the future
- Multiple transition pathways will be relevant, but which ones fit the business will depend on the pace of changes in customer demands and the deployment of advanced technologies

What actions will the Utility of the Future take to meet these challenges?

- **Leverage Enterprise Model Innovation to reduce costs and improve operational performance when customer interest in control is low or the regulatory structures to support customer control are weak**
- Leverage Revenue Model Innovation to develop new products, services, and pricing options when customers demand more control but technology deployment is blocked or delayed
- Leverage both EMI and RMI as interim steps towards Industry Model Innovation while the full Participatory Network gradually develops and evolves

PLM Example: Hydro-Quebec

The Company

Hydro-Quebec is an integrated electrical company that generates, transports and distributes almost all the electricity consumed in Quebec. With more than 23,000 employees and a single shareholder (the Quebec government), its generating fleet comprises 56 hydroelectric generating stations, a nuclear generating station, four conventional thermal generating stations and a wind farm, representing a total installed capacity of 35.5GW.

The Challenge

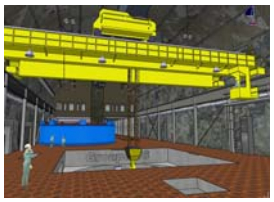
Plan and validate project schedule for refurbishment of Manic-3 generating station. Reduce cost and manpower associated with the project.

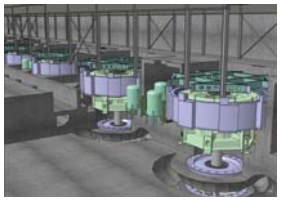
The Solution

IBM and Dassault Systèmes supported Hydro-Quebec used CATIA and DELMIA to virtually represent the plant and equipment, and to simulate the dismantling, moving and reassembly of equipment inside the plant.

The Benefits

Project time savings of 200 man-weeks and cost savings of $50M
Validate feasibility of complex activities of cranes





PLM Example: San Onofre Nuclear Generation Station

The Company

San Onofre Nuclear Generation Station (SONGS) is the largest generator of electricity in Southern California, serving 2.75 million homes. Growing demand for electricity and the lack of replacement capacity prompted SONGS to upgrade its plant equipment, paving the way for Edison officials to apply for a license extension that would allow the plant to produce power through 2042.

The Challenge

Thimble Replacement and Maintenance Outage (3 month outage at cost of $90M for repair & refueling in 2006). For the first time Divers (UCC) were used to enter into the reactor pool via custom scaffolds and robotic chairs to service the thimble rods..

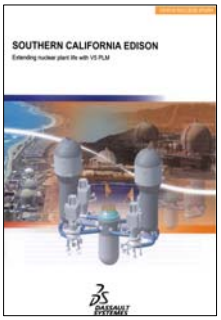
The Solution

Dassault Systèmes supported SONGS V5 PLM implementation of CATIA, DELMIA and ENOVIA (ENOVIA VPLM and ENOVIA SmarTeam). These solutions were used to create digital models of SONG's facilities. These models were used to simulate the activities involved in replacing the thimble rods and to the concept of using virtual simulations in future SONGS projects.

The Benefits

Validated design of special robotics chairs that providing divers with access to the thimble rods themselves. Virtual diver training minimized the risk of overexposure and accidents.

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company
San Onofre Nuclear Generating Station



IBM Global Business Services

The Characteristics of The Utility of the Future

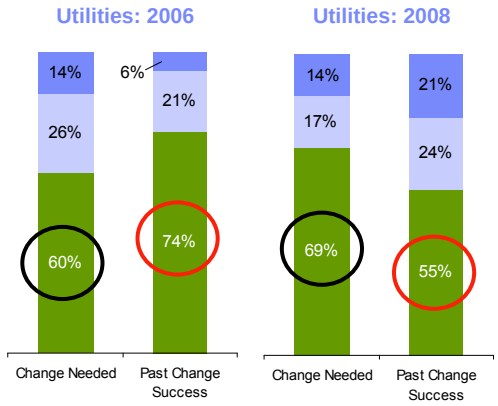
Hungry for Change

"We are OK at change on some big ticket items like asset sales, but we have less success in drive success around changing customers and developing new value propositions."
- Utility executive, Australia

HUNGRY FOR CHANGE

The confidence of utility CEOs in their ability to manage change has dropped since 2006, even as they believe the need for change has grown

CEO perceptions of change needed vs. past success in managing change, '06-'08



Change Need: UP 9 percentage points

Change Success: DOWN 19 percentage points

Change Needed	Past Change Success
No/limited Change	No/limited Success
Moderate Change	Moderate Success
Substantial Change	Substantial Success

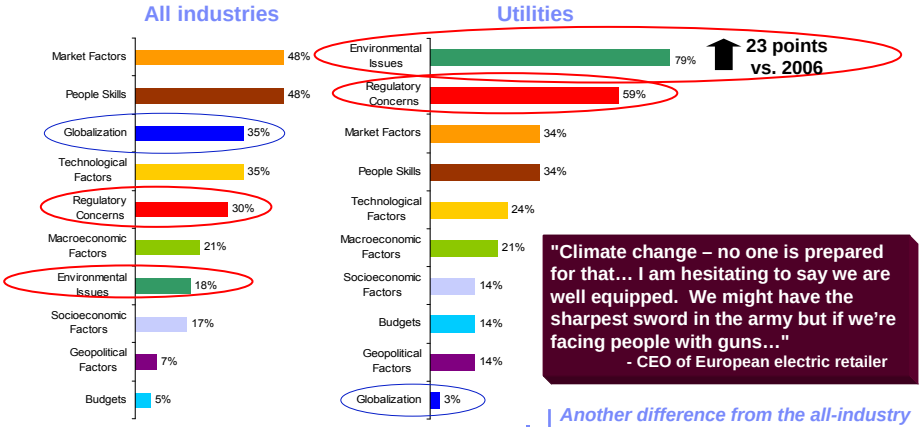
One North American utility stated that past changes have been met with a "sense of disbelief", and that changes have more recently been kept modest to avoid "fatigue" associated with change.

Source: IBM Global CEO Study 2008, IBM Global CEO Study 2006

HUNGRY FOR CHANGE

The need for utility change is driven by many of the same challenges as other industries, but environmental and regulatory issues are much more important

External forces impacting the organization



"Climate change – no one is prepared for that… I am hesitating to say we are well equipped. We might have the sharpest sword in the army but if we're facing people with guns…"
- CEO of European electric retailer

Another difference from the all-industry results: Utilities see far less impact from globalization in the near future

Source: IBM Global CEO Study 2008, IBM Global CEO Study 2006

HUNGRY FOR CHANGE

The change that utility CEOs increasingly expect is already hitting the industry, and leading companies and industry organizations are responding

	INNOVATIVE BEYOND CUSTOMER IMAGINATION	GENUINE, NOT JUST GENEROUS	GLOBALLY INTEGRATED	DISRUPTIVE BY NATURE	HUNGRY FOR CHANGE
Pacific Northwest National Laboratory (US)	●	●			●
DONG Energy (Denmark)	●			●	●
EnBW (Germany)	●	●		●	●
Oxxio (Netherlands)	●	●		●	●
ARPEL (Uruguay)		●	●		●
Meridian (New Zealand)		●		●	●

HUNGRY FOR CHANGE

Change within the Utility of the Future

How are views on change shaping the Utility of the Future?

- The level of expected utility change is increasing, while there is a growing uneasiness among utilities about their ability to manage change
- Utility change is expected to focus on environment and regulatory issues, with significantly less focus on globalization than in other industries
- Innovative work with regulators has helped to proactively address change and to spur valuable customer innovations, but many CEOs remain unclear on what regulators will impose or allow

What actions will the Utility of the Future take to meet these challenges?

- Take an analytical view of the changes that will affect the company, evaluate a range of change scenarios, balance costs and opportunities, and make firm decisions on how to shape change
- Groom leaders and build capabilities that will most effectively drive and manage change within the company
- Develop the skills and tools needed to analyze the options for addressing environmental issues and implementing optimized solutions
- Partner with regulators to jointly anticipate change and set expectations, demonstrate understanding and a willingness for constructive change, and build programs with incentives for changes that benefit all stakeholders

PLM Example: Xcel Energy

The Company

Xcel Energy operates two Minnesota commercial nuclear sites, Prairie Island and Monticello, which together provide approximately 1,700 megawatts of electricity.

The Challenge

Simulate critical mechanical system upgrades in support of an extended upgrade to the plant's power generation rate. Reduce plant downtime by optimizing the scheduling, planning, and installation of equipment.

The Solution

The Monticello Nuclear Generating Plant used DELMIA DPM Assembly, Human Builder, and Human Task. BCP Engineers & Consultants and Dassault Systèmes are working with Xcel to plan and schedule its General Electric Zinc Injection Process (GEZIP) mechanical system-installation project. A key challenge for the commercial nuclear industry is the installation of new systems or modification to existing systems. Additionally, with very tight outage schedules, it is critical that the transfer, movement, installation, and connections such as the GEZIP system occur within committed work plans and schedules.

The Benefits

DELMIA simulations determined the most optimal work schedule and task sequence. Plant downtime was minimized by optimizing the scheduling, planning, and installation of equipment.

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The Characteristics of The Utility of the Future

Summary

As Enterprises of the Future, utilities across the globe need to prepare for changes on several fronts

- More informed and collaborative customers will have a profound impact on the shape of the industry as they demand more control over their energy sources and consumption
- The utility industry's response to environmental issues has given the industry valuable experience and a leadership position in that area; increasing focus will now be placed on understanding, acting upon, and communicating the full spectrum of corporate social responsibility concerns with a view toward future expectations, not just compliance with present ones
- Most utilities are not Globally Integrated Enterprises, but understanding "globalization gaps" seen with other industries can help energy and utility companies think effectively about leveraging elements of globalization that are already present (e.g., supply chain and services) and finding new benefits
- These changes will cause major shifts in business models as "passive persistence" gives way to transformational innovation in enterprise and revenue models
- The sum and pace of these changes is something to which few CEOs have been exposed, which is fostering a lower confidence of success; taking an analytic view of the changes, watching developments around the world, and then acting in advance of change will restore confidence

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The Industry Solution Center @ IBM Forum La Gaude

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Are some of the IBM solutions contributing to support safe reliable and efficiency power generation, transmission & distribution by energy companies

Engergy & Utilities

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The IBM Global Solution Center (GSC) - Dallas

Industry Solution Leadership

Leading Edge Technology

Exhibits and customer hands-on demonstrations

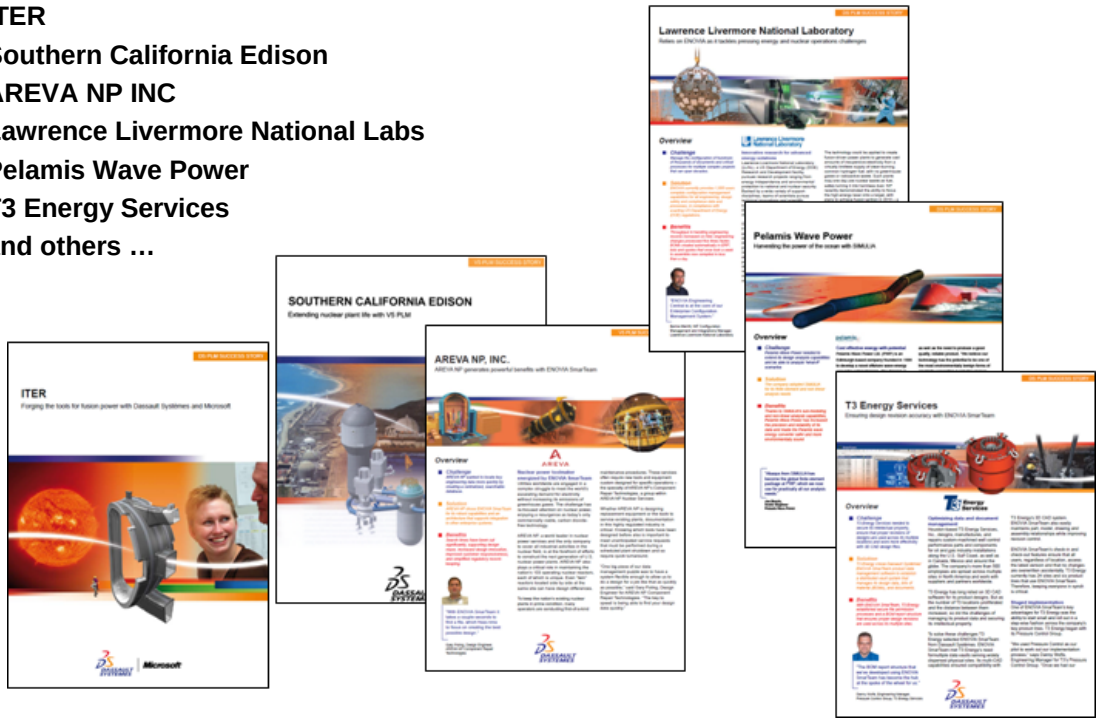
Live prototypes around
RFID
Security
Biometrics
Energy

Learning More and References

Customer stories available from Dassault Systèmes can be found at:

www.3ds.com/company/customer-stories

- **ITER**
- **Southern California Edison**
- **AREVA NP INC**
- **Lawrence Livermore National Labs**
- **Pelamis Wave Power**
- **T3 Energy Services**
- **and others …**



You can find the full CEO Study Highlights: *The Utility of the Future* at:
www-03.ibm.com/industries/utilities/us/detail/resource/V971365W76359X69.html

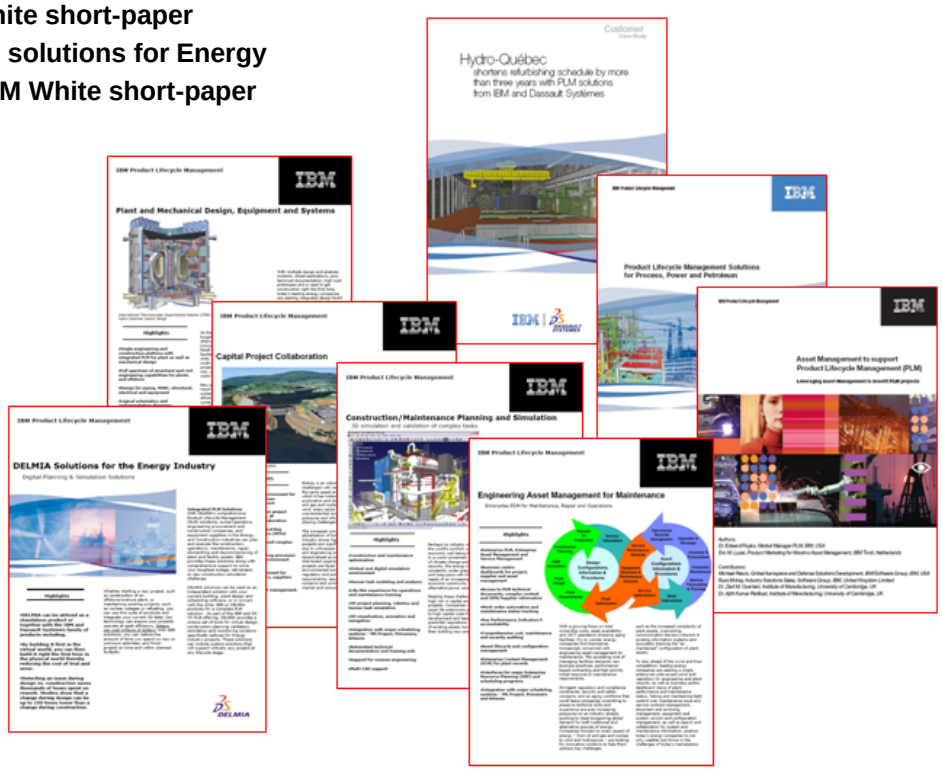
IBM has created an **Energy Assessment** to assist utility clients identify process and technology improvements. If your company is interesting in perusing an assessment, contact your IBM Product Lifecycle Management local sales representative or Bradford Cabibi, PLM Methods and Diagnostics, at **cabibi@us.ibm.com**

PLM is focused on its customer's success and the role information technology plays in their business results. If you would like to participate in PLM's **Energy Trends in Information Technology survey**, you can access it at:
www.ibm.com/services/forms/signup.do?source=swgplmenergy
For your participation, you can download several special energy and technology reports.

IBM PLM solution and customer information is available at:

www-01.ibm.com/software/plm/industries/energy_and_process.html

- **Hydro Quebec detailed reference**
- **PLM Energy Solutions Overviews**
- **EAM White short-paper**
- **DELMIA solutions for Energy**
- **PLM EAM White short-paper**



For more information contact your IBM Representative,
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ibm.com/software/plm