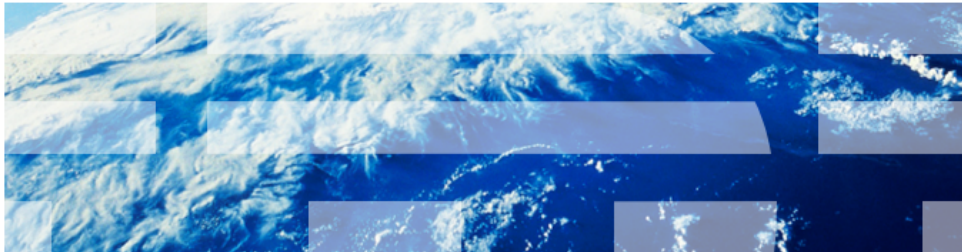


Let's Build a Smarter Planet: Energy and Utilities



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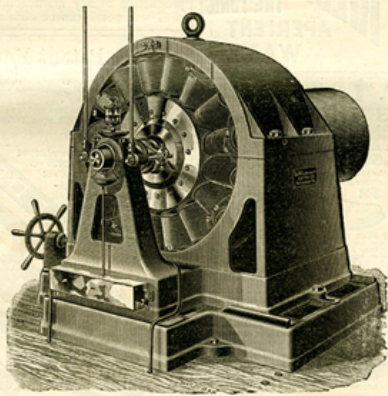
LET'S BUILD SMARTER PLANET: ENERGY AND UTILITIES

Welcome and thank you for joining us today to discuss the future of the energy and utilities industry in the context of the dynamic and increasingly demanding world around us. This new reality was discussed by Sam Palmisano in his recent speech introducing characteristics of a Smarter Planet and their role in enabling industry systems to become “smarter”:

“The world is becoming not just smaller and flatter, but also *smarter*. What this all means is that for the first time in history almost anything can become digitally aware and interconnected. We will all begin to transform our systems, operations, enterprises and personal lives to take advantage of a smart planet isn't just because we can. It's because we must.”

Current and emerging capabilities can enable energy and utility organizations to “think and act in new ways” - from sensors, smart meters and digital controls to new tools that allow consumers to proactively manage their energy usage.

Today we will share our point of view for “smarter energy” and invite you to explore opportunities for a smarter utility with us.




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ALTERNATING
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WILBUR'S DEAFNESS



The origin of the electric grid

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In the 1880s, Nikola Tesla invented the 3-phase 60 Hz technology still used in the North American electrical grid, which was then commercialized by George Westinghouse, who was competing with Thomas Edison.

One hundred and twenty five years later, the Smart Grid aims to solve this 19th century problem using 21st century systems.



The need for progress is clear

The facts on the next two pages are startling and speak for themselves. Even in a globally connected and globally dependent world, we still see these staggering realities occurring:

Projected growth in worldwide energy demand by 2030 is 36.8%.

170 billion KWHrs are wasted each year by consumers due to insufficient power usage information.

One quarter of the world's greenhouse gas emissions are created by power generation.

The need is indeed clear and the opportunity is within our reach.


Global market forces are impacting us all... and with this impact, the need for progress is clear. To make the world smarter, it helps to understand the way it works—the basic patterns, principles, and flows that help shape the interactions between man-made systems and nature's systems, between technology and organizations, between individuals and communities. The need for progress can be seen through these statistics... which we have some level of knowledge but may not realize the 'significance'.

Sources:

¹ International Energy Outlook 2008

² Ontario Smart Price Pilot report:
<http://www.oeb.gov.on.ca/OEB/Industry+Relations/OEB+Key+Initiatives/Regulated+Price+Plan/Regulated+Price+Plan+-+Ontario+Smart+Price+Pilot>

³ The Climate Group and McKinsey & Co., "Smart 2020 Report"

Let's build a smarter planet: Energy and Utilities 

The opportunity for progress is clear.

10% reduction in electricity bills	\$70 billion	14% lower emissions
In the Pacific Northwest National Laboratory Smart Grid project, consumers decreased their overall peak load on the grid by 15% when offered the opportunity to save an average of 10% on their electricity bills.	North America could save \$70 billion in infrastructure spending over the next 20 years through better management of existing assets.	Smart grid technology has the potential to reduce the power sector's CO ₂ emissions 14% by 2020.

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The opportunity for progress is clear

How can we proceed on the path to a smarter planet? With so much technology and networking capabilities abundantly available, what *wouldn't* you put smart technology into? What service *wouldn't* you provide? What *wouldn't* you connect? What information *wouldn't* you mine for insight?

In the Pacific Northwest National Laboratory Smart Grid project, consumers decreased their overall peak load on the grid by 15% when offered the opportunity to save an average of 10% on their electricity bills. Forward thinking utilities are doing such things. Utilities around the world will continue to do some level of transformation to address the need for change... they will do what they *CAN*. But the even more compelling reason we must all begin to transform our systems, operations, enterprises and personal lives to take advantage of a smarter world isn't just because we can. It's because we *MUST*.

Sources:

⁴ IBM Pacific Northwest National Laboratory case study

Pacific Northwest National Laboratory reference: <http://w3-01.ibm.com/sales/ssi/cgi-bin/ssialias?infotype=CR&subtype=NA&htmlfid=0GLOS-72NV6X&appname=crmd>

⁵ The Climate Group and McKinsey & Co., "Smart 2020 Report"

A mandate for change is a mandate for smart.



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So, yes, the world continues to get flatter. And yes, it continues to get smaller and more interconnected.

But something is happening that holds even greater potential.

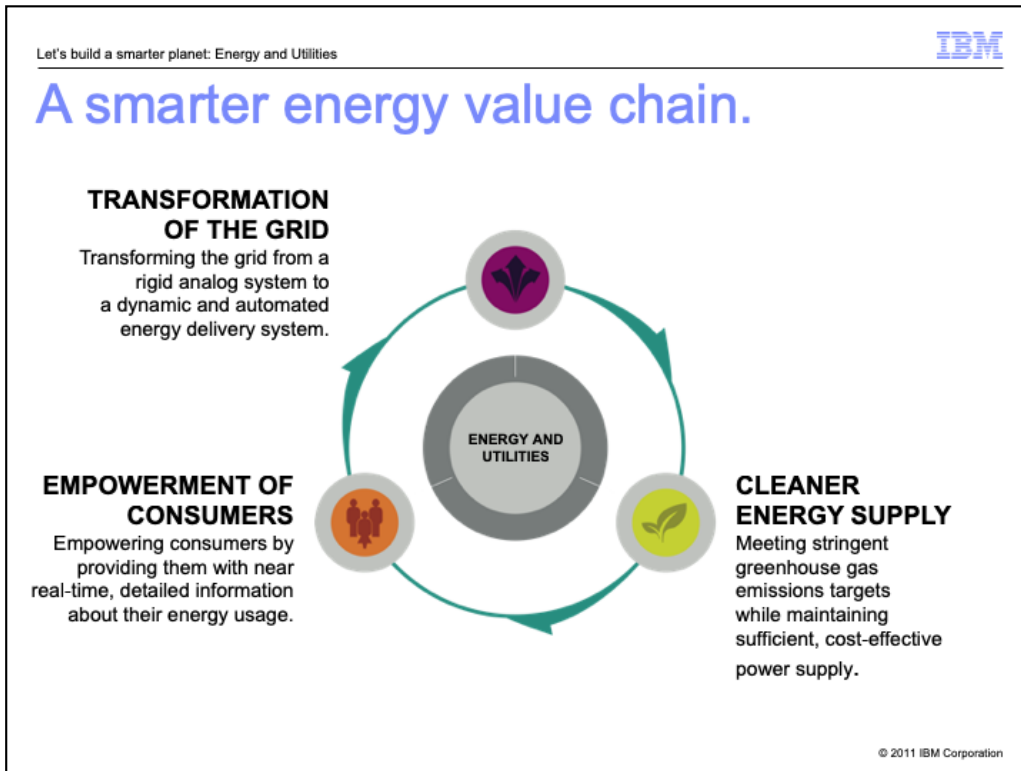
In a word, our planet is becoming smarter.

This isn't just a metaphor.

And I'm not talking about the Knowledge Economy—or even the fact that hundreds of millions of people from developing nations are gaining the education and skills to enter the global workforce.

I mean the infusion of intelligence into the way the world literally works—the systems and processes that enable physical goods to be developed, manufactured, bought and sold... services to be delivered... everything from people and money to oil, water and electrons to move... and billions of people to work and live.

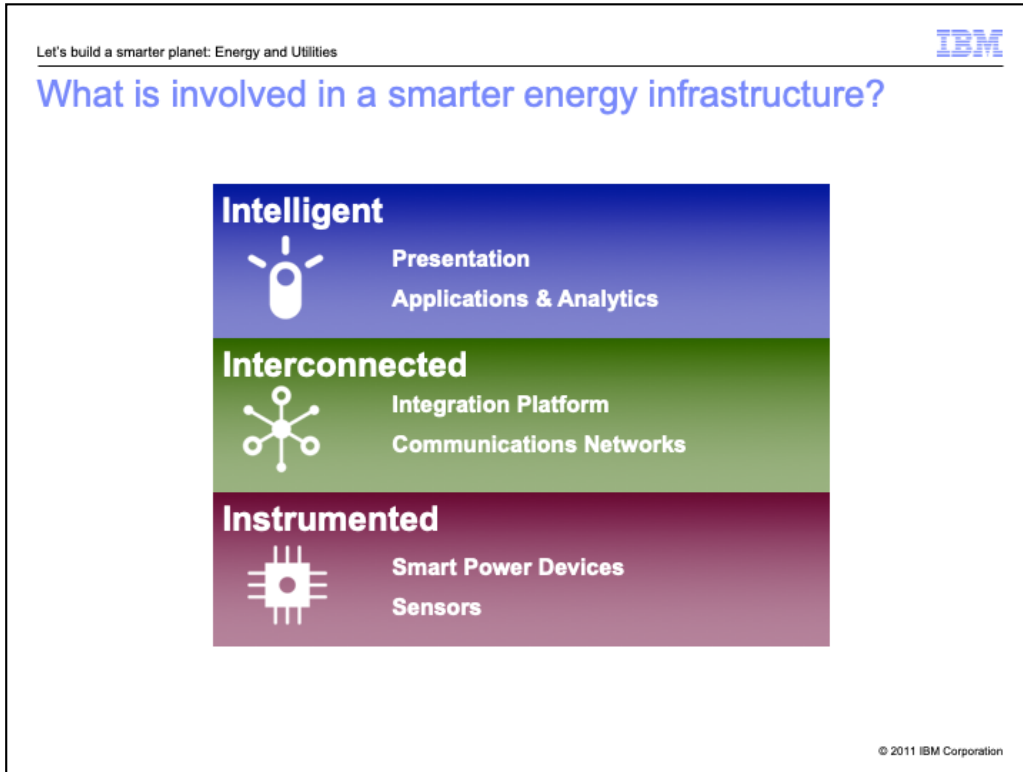
The mandate for change and sustainability of the planet is a mandate for smart.



To deliver power more responsibly and more efficiently, smart energy and utilities organizations are working toward a smarter energy value chain.

The good news is that Utilities are now able to transform the way power is sourced, distributed, and consumed. "Smart grids" use sensors, smart meters, digital controls and analytic tools to automatically monitor and control two-way energy flow and that allow consumers to manage energy usage right down to the individual networked appliance. With information about their consumption and automated energy management tools, consumers can proactively manage their energy use and choose sources of power. With smart grids, energy companies will be able to detect a power outage instantly, know the exact location and cause, re-route power, and tell users when power will be restored.

Smart grids also allow energy and utility companies to better understand power demand in near real time, so they can improve delivery and dynamically incorporate energy from different sources. These capabilities support greater use of more sustainable energy sources, such as wind and solar generation, and will help meet rapidly growing energy demand around the world such as enabling widespread charging of new devices like "plug-in" electric vehicles.



INSTRUMENTED

Imagine, a billion transistors for every human being. Sensors are being embedded everywhere: in cars, appliances, security cameras, roads, pipelines...even in medicine and livestock.

While select systems are becoming smarter, the vast majority of the world's IT infrastructure—mobile devices, PCs, servers, data centers, software and the processes that make it all work—remain slow, inefficient and incapable of the work ahead. But there are new computing capabilities that can literally "reinvent" existing IT properties, making them leaner, flexible, resilient and smarter. The intelligent utility network we'll need to power the 21st century looks more like the Internet than the traditional grid. It's widely instrumented, linking many thousands -- even millions -- of power sources -- including wind and solar -- and embedded with information technology. And there are projects around the world where utilities are installing millions of intelligent meters and sensors.

INTERCONNECTED

Communication and collaboration are at the heart of Interconnected. With smart grids linked to smart meters in the home, people will decide how much energy they want to use and when they want to use it. Every home, business and factory can become a sensor enabling the network to learn, predict and even help shape supply and demand behavior.

Virtual marketplaces between consumers and providers allow consumers to trade flexibility in usage for lower costs.

And then think about the amount of information produced by the interaction of all those things.

INTELLIGENT

Being connected and instrumented are not sufficient. We also have to infuse intelligence into our systems and ways of working. You can depend on new computing models to manage the massive amounts of data generated by the proliferation of end-user devices, sensors, and actuators. Combined with advanced analytics, these technologies are making us smarter. Smart utilities share information from multiple sources to assess situations, make intelligent decisions and react quickly.

Power grids use sensors, smart meters, digital controls and analytic tools to automatically monitor and control two-way energy flow.

Smart energy and utilities: What is smart?

Cleaner energy supply.

Transformed grid.

Empowered consumer.



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Cleaner energy supply

Smoothing power demand in order to take advantage of off-peak supply such as wind.

Maintaining a sufficient, cost-effective power supply while managing stringent greenhouse gas emissions targets.

Integrating distributed renewable energy sources

Transformed grid

Knowing exactly where a power outage occurs and instantly dispatching a crew to fix the problem.

Preventing outages before they occur by sensing potential equipment failures.

Extending asset life by sensing and managing the stress placed on aging equipment.

Reducing peak load by communicating with energy consumers and having them turn off non-essential machinery or appliances.

Empowered consumer

Analyzing customer energy usage and providing customized energy products and services to meet their needs.

Helping customers conserve energy by providing them with tools to proactively manage their energy usage.

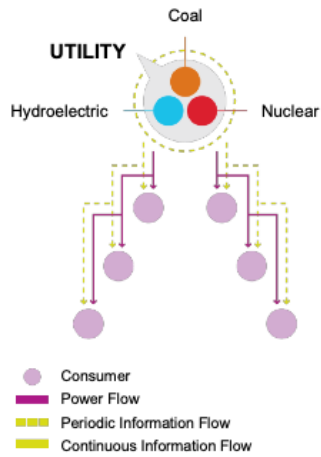
Ensuring that customers are billed accurately and on time.

Helping customers establish a "smart home" that turns appliances on and off to reduce energy costs.

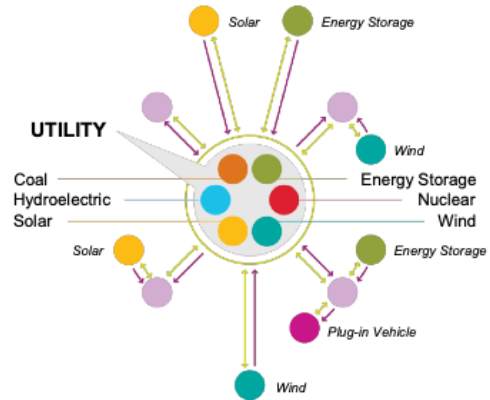
The result?

Empowered consumers and energy for a sustainable future.

TRADITIONAL GRID



SMART GRID





We've only just begun
to uncover what is possible
on a smarter planet.

- The world will continue to become smaller, flatter and smarter. We are moving into the age of the globally integrated and intelligent economy, society and planet.
- There's no better time to start building smarter energy and utilities organizations—focused on providing energy responsibly to empowered consumers. And there's no better time to invest in creating the kind of society we all desire.

Let's work together to drive real
progress in our world.

We've only just begun to uncover what is possible on a smarter planet.

The reality is that the Internet has been instrumental in creating a globally integrated world and it is up to us to take advantage of it. We are moving into the age of the globally integrated and intelligent economy, society and planet.

IBM scientists and industry experts are working on smart energy solutions like these around the world. We're helping build seven of the world's ten largest automated meter management projects. And we're partnering with utility companies representing nearly 50 million consumers in the Global Intelligent Utility Network Coalition to accelerate the adoption of smart grid technologies and business solutions.

We won't have this opportunity forever. I think one thing is clear: we agreed earlier that the world will continue to become smaller, flatter and smarter. We are moving into the age of the globally integrated and intelligent economy, society and planet. IBM invites you to work with us to drive real progress for our endearing planet. We welcome your ideas and look forward to the opportunity to co-create solutions for smart utilities and a smarter planet. Thank you for your attention and your input!

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