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SPEAKERS: PHILIPPE DELORME, Executive Vice
President, Strategy and Innovation,
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GREGG DIXON, Senior Vice President,
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CRAIG A. HUFF, Co-CEO and
Co-Founder, Reservoir Capital Group

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OVERVIEW

Today's cities use 75% of the world's energy and are responsible for 80% of energy-related carbon impact. As a result, looking at cities in the context of energy conservation is essential. Although many technologies can improve energy efficiency, obstacles exist to their implementation. Neither businesses nor consumers have clear visibility into their energy usage and waste; businesses are reluctant to make investments without a rapid payback; and many consumers are resistant to change.

Energy-efficiency measures must be presented in a simple way, with a short payback period. Marketing also can be effective for changing residential consumers' behavior. Given the enormous growth expected in emerging markets, focusing on energy-efficiency efforts there is strongly recommended.

CONTEXT

The panelists discussed how energy efficiency can be promoted in the business world and among residential consumers.

KEY TAKEAWAYS**Urban systems are complex, but opportunities exist to improve energy efficiency.**

Urban areas are very energy intensive. Today's cities use 75% of the world's energy and are responsible for 80% of energy-related carbon impact. One of the challenges associated with energy efficiency is the complexity of city systems.

Energy networks, waste systems, water networks, and security systems all must function effectively. Bringing the right businesses together to develop the right architecture is important. No single company has the answer. Smart cities will be built by an ecosystem of collaborative and agile businesses.

Mr. Delorme sees three key opportunity areas related to energy efficiency in cities:

1. *Renewable technologies.* Renewable energy is essential for reducing cities' carbon footprints.
2. *Electric vehicles.* Removing the roadblocks to electric vehicles should have a major impact on energy consumption in cities.
3. *Energy storage.* Finding energy storage with acceptable costs is a challenge. Unlike water, storing energy on a mass scale affects the way smart cities are architected.

"Energy in smart cities is a huge opportunity. I see the green impact and the P&L coming together. Thanks to technology, change from people, and education, these things are coming together."

– Philippe Delorme

Visibility into energy usage and waste is needed before improvements can be made.

Energy waste is found everywhere and small changes could make a significant difference. For example, motion detectors could turn down heating and lighting when rooms are unoccupied. Building engineers could fill water tanks at off-peak times or shut down HVAC systems for 30 minutes periodically.

For these types of changes to occur, however, transparency on energy usage and price information is needed in both the business and residential sectors. The cost signals that the average consumer gets with regard to energy usage today are unclear. People and businesses don't know how much they spend.

Although large buildings offer the greatest prospect for energy savings, inertia and competing interests often interfere.

Buildings alone consume 40% of the energy used in cities. That is a larger amount of energy than is used by industrial processes or transportation. Buildings also are responsible for 21–22% of the greenhouse gases in the environment.

Technology is available to dramatically improve the energy efficiency of buildings and billions of dollars can be saved. However, action isn't being taken as rapidly as one might expect. One reason is that people are averse to change. A second contributor is competing interests among stakeholders. For example, a building may be operated by one person, owned by another, and occupied by a third. All have different interests.

"Modernizing our industry with energy efficiency in new buildings will probably take 50 to 100 years. We don't have that much time."

– Andreas Schierenbeck

The energy-efficiency value proposition for businesses must be simple.

Very few companies have hired staff to focus on energy efficiency. While many of EnerNOC's large business customers spend millions on energy, they may lack a deep understanding of energy and power. However, they do understand the difference between a \$1 million dollar energy bill and an \$800,000 bill.

EnerNOC strives to make energy savings simple for its business customers to understand. It uses the concept of demand response, paying customers to reduce electricity usage during times of peak demand. EnerNOC installs the necessary technology for free and provides customers with data and recommendations about how to obtain greater energy efficiency. Each customer receives a savings check from the company.

Even though EnerNOC customers have real-time technology to monitor energy consumption at a granular level, they often don't use it. The staff already has a job to do. In addition, the energy expense may only represent 1–3% of revenue. Companies will not actively manage this on their own. The value proposition has to be simple and have a fast payback. EnerNOC has found that businesses are looking for projects with essentially an immediate payback of one year or less.

“The United States is the technological epicenter of the world. There is a great opportunity to combine information technology with energy management, but only if we make the value proposition very simple.”

– Gregg Dixon

Over a period of five years, LEED certification has become accepted and valued in the commercial real estate industry.

Five years ago, LEED (Leadership in Energy and Environmental Design) certification was introduced to the market. Since that time, it has turned the real estate industry around. Last year in the United States, 60–70% of all new construction of more than \$25 million requested partial or complete LEED certification.

A real estate developer who spends \$3 billion per year told Mr. Schierenbeck that he now always goes for LEED construction—not necessarily for environmental reasons, but because it makes financial sense. Buildings with LEED certification have a 5% higher market value, with zero to 3% additional cost. LEED buildings are easier to sell, command 20% higher rent, and have 10% fewer problems. The value of LEED buildings also declines more slowly than comparable non-LEED construction.

The residential building segment is fragmented and hard to address, but marketing holds promise for energy-efficiency measures.

The residential building market represents 20% of energy consumption. While the commercial building industry is concentrated, the market for residential buildings (houses and apartments) is fragmented and therefore more difficult to address. One reason is that no one has marketed the value of energy-efficiency measures to consumers in an easy-to-understand manner. As a result, consumers have been slow to make changes such as using compact fluorescent light bulbs, even though they reduce a household's utility bills by 25%.

OPower has started a marketing campaign that leverages the power of social networks. It takes utility data and tells consumers how their energy usage compares to their neighbors. Consumers understand this type of message.

Government action is critical to improving efficiency.

Most governments avoid building and operating power plants. Instead, they provide incentives to the private sector through vehicles like feed-in tariffs. Southern Europe is using feed-in tariffs to provide fair returns for solar investments and Brazil uses them for wind power. Brazil is also using long-term contracts to encourage small hydroelectric plants.

In Africa, Reservoir Capital has found that politicians support power projects because it gets them re-elected. The most dysfunctional region, however, is Eastern Europe and the former Soviet Union. They haven't figured out how to use incentives to attract capital.

In addition to providing incentives, governments also can create programs that promote energy efficiency. For instance, it would be useful to have an Energy Star-type rating on the sides of homes, showing their energy statistics and efficiency. Mr. Dixon noted, however, that investors value the portion of a clean tech or renewable company's earnings that comes from government subsidies differently from other earnings. This is because government funding is uncertain and may go away when the political winds change.

KEY TAKEAWAYS**Since emerging markets will use significantly more energy in the future, energy efficiency must be improved there.**

Approximately half of the world's energy use today is in developed countries and the other half is in emerging markets. Looking ahead, almost 89% of growth in energy usage will come from less developed countries. This is mostly driven by people moving to cities.

Reservoir Capital has partnered with Coca-Cola in emerging markets where the power is expensive and unreliable. They have built small, efficient power plants at Coke facilities. These plants provide Coke with electricity, and the resulting heat is used to create steam. In addition, chillers generate cold water and the carbon dioxide from the power plants is used to carbonate Coca-Cola beverages. Power plant efficiencies can reach as high as 85%, compared with the usual 35–40%.

Reservoir Capital benefits by making a fair rate of return on these long-term contracts. Coca-Cola avoids having to deal with governments in emerging markets.

“About 85% of global energy consumption today is still fossil fuel and the vast majority of that is quite inefficient. Energy efficiency is definitely the place to focus.”

– Craig Huff

Other Important Points

- *Million-person cities.* Just 200 years ago, London was the only city in the world with one million residents. Today there are more than 400 cities around the world with at least a million people.
- *The Greenprint Foundation.* This foundation is trying to get financial institutions and large portfolio owners to develop an index to measure building performance over time.
- *Energy efficiency and corporate social responsibility.* Some businesses pursue energy-efficiency programs in the interest of reducing their carbon footprints and advancing corporate social responsibility. This is more common among European companies than those in the United States.

FOREST L. REINHARDT (MODERATOR)

Forest L. Reinhardt is the John D. Black Professor of Business Administration at Harvard Business School.

Reinhardt is co-chair of Harvard Business School's Global Energy Seminar, a new executive education course for the leaders of firms that produce oil and gas, generate and distribute electricity, or play other important roles in the delivery of energy services. He also teaches regularly in the HBS Agribusiness Seminar.

In the HBS Owner/President Management Program, Reinhardt teaches a core course on Global Markets. Drawing on microeconomics, macroeconomics, political science, and history, the course helps business leaders understand the economic and political environment in which business is conducted, and the strategic opportunities and risks to which globalization gives rise.

Reinhardt recently served as course head for the required MBA course Strategy, which covers topics in industry analysis, competitive advantage, and corporate strategy.

Reinhardt currently serves as the faculty chair of Harvard Business School's European Research Initiative.

Reinhardt is interested in the relationships between market and nonmarket strategy, the relations between government regulation and corporate strategy, the behavior of private and public organizations that manage natural resources, and the economics of externalities and public goods. He is the author of *Down to Earth: Applying Business Principles to Environmental Management*, published by Harvard Business School Press. Like that book, many of his articles and papers analyze problems of environmental and natural resource management. He has written numerous classroom cases on these and related topics, used at Harvard and many other schools in MBA curricula and executive programs.

Reinhardt received his Ph.D. in business economics from Harvard University in 1990. He also holds an MBA from Harvard Business School, where he was a Baker Scholar, and an AB, cum laude, from Harvard College.

PHILIPPE DELORME

Philippe Delorme joined Schneider Electric in 1996. He is executive vice president, strategy and innovation, and has been a member of the Executive Committee since July 2009.

He has held various positions in operations in the United States and France. He started his career as a business engineer and then took an R&D management position within the Electrical Distribution division in France. He led the Electrical Network Automation business from 2000 to 2004. In August 2004, he moved to the United States to lead the Power Monitoring and Control business. Since January 2008, Delorme has been in charge of the company program One, which is the strategic execution plan.

Delorme graduated from the Centrale Paris engineering school and completed an MBA in International Business at Sciences Po Paris.

GREGG DIXON

Gregg Dixon has led various sales, marketing, and business development efforts at EnerNOC and currently leads worldwide marketing efforts to utility and end-use customers. Dixon is primarily responsible for leading the development of EnerNOC's go-to market strategy, product and service development, and the execution of marketing mechanisms that accelerate profitable sales growth and brand recognition through creative and customer-driven insights.

Prior to joining EnerNOC, Dixon was vice president of marketing and sales for Hess Microgen, the leading provider of commercial on-site co-generation systems and services in the United States. As a highly recognized expert in distributed generation, Dixon pioneered efforts to bring more than 100 co-generation systems to leading grocery, hospitality, commercial property, and manufacturing customers and developed Hess Microgen's Internet-based monitoring system, CONIFER. Dixon was also a partner at Mercer Management Consulting, where he advised global Fortune 1000 technology, consumer products, and energy clients on customer and product strategy, economic choice analysis, and new business model development.

BIOGRAPHIES

Dixon graduated from Boston College with bachelor's degrees in business administration and computer science. He is a Certified Energy Manager, Certified Demand Side Management Professional, and Certified Sustainable Development Professional with the Association of Energy Engineers. Dixon also was voted one of Boston's "40 Under 40" by *Boston Business Journal* as recognition for having established himself as a leader to be watched in the field of energy.

CRAIG A. HUFF

Craig Huff is co-CEO and co-founder of Reservoir Capital Group, a privately held investment firm formed in 1997. Reservoir, based in New York City, employs an opportunistic investment strategy and has over \$4.5 billion under management. Huff was a partner at Ziff Brothers Investments prior to founding Reservoir.

Huff currently serves on the boards of many of Reservoir's portfolio companies, including ContourGlobal, Intrepid Aviation, Amerilife Group, AB Resources, and Aspen Aerogels. Additionally, he has been instrumental in the formation and development of a variety of investment firms, including Ellington Capital, Olympus Capital Partners, Rockport Capital Partners, SAB Capital, Ziff/Sandfer Capital, Clearlake Capital, Standard General, Chambers Energy Capital, and several others.

Huff is president of the board of trustees of St. Bernard's School in New York City. He also serves on the board of trustees of the Princeton Theological Seminary and on the board of advisors of the Center for Regenerative Medicine (Massachusetts General Hospital/Harvard Stem Cell Institute).

Huff graduated magna cum laude from Abilene Christian University with a BS in engineering physics and received an MBA from Harvard Business School with high distinction as a Baker Scholar. Prior to HBS, he served in the U.S. Navy as a nuclear engineer and nuclear submarine officer.

ANDREAS SCHIERENBECK

Andreas Schierenbeck leads the Building Technologies (BT) Division of Siemens Industry. As president, Schierenbeck is responsible for the financial, operational, and competitive success of Siemens Industry Sector's U.S.-based building systems and energy efficiency solutions provider.

Having held executive and leadership positions at major global BT business units and other Siemens companies, Schierenbeck brings to his post nearly 20 years of progressive experience guiding companies to profitability and market success. Most recently he served as global CEO for the Building Automation business unit in Zug, Switzerland. Prior to joining BT in 2005 as senior vice president for Fire Services, Schierenbeck was vice president of the Siemens Power & Distribution Substation Automation business. A graduate of Harvard Business School's Executive MBA Program in 2009, Schierenbeck also served as vice president of eu.bac—the European association of building automation and controls suppliers. He is a member of the World Business Council for Sustainable Development and has lived and worked in Switzerland, Austria, Germany, and Colombia.