



Energy Efficiency in the U.S. and India: A Study in Contrasts and Possibilities

Large amounts of capital are beginning to flow to the energy efficiency sector, but the breadth of market opportunities is wide. **Patrick McCloskey and Stanley Trybulski** of Evolution Markets Financial Services, bridge the divide with a view from the U.S. and India.

Energy efficiency is widely seen as the “low hanging fruit” for carbon reductions and sustainable development. It’s the triple threat of lower energy consumption, reduced operating costs, and mitigation of climate change.

Not surprisingly, the sector is receiving increased attention from investors of all types. According to the 2009 Global Trends in Sustainable Energy Investment report, from 2007 to 2008 there was a 37% jump in new private investment of companies developing and improving upon new technologies such as energy efficiency. Bets are being placed on technologies, service providers, power generators, and consultants. The opportunities for costs savings and environmental benefits range widely depending where in the world you decide to invest.

To provide a snapshot of the breadth of opportunities, this Executive Brief explores the energy efficiency landscape in two of the world’s largest markets — United States and India. Energy efficiency (EE) measures will play an important role as these nations continue to balance economic growth and environmental protection. However, India and the U.S. face two divergent realities.

On one side, the United States is the largest consumer of energy in the world. Its population enjoys abundant and relatively inexpensive energy. When it comes to efficiency improvements, the spotlight shines on the general population’s over-electrification of homes and buildings.

Across the globe, half of India is reeling in the dust of its economic growth. An approximate 600 million people do not have access to electricity — that’s twice the population of the U.S. In order to address this socially unacceptable circumstance, the Indian government is ramping up fossil fuel-based energy generation while also staying mindful of the environmental impacts of such expansion. As a means to facilitate efficient measures, market-based incentives are being developed in both countries.

Somewhat changing the course forward for both nations was the UN’s climate meeting in Copenhagen in December 2009. The negotiations did not produce the results many hoped would lead to an international climate agreement, but the meeting opened the door for individual national actions to mitigate climate change. Consequently both India and the U.S. have looked inward to develop policies and markets for supporting domestic goals, and energy efficiency will play a key role.

EE in the U.S. Follow the Money

Perhaps not surprisingly, Americans consume more energy than virtually any other country. According to the U.S. Department of Energy’s Energy Information Administration, the U.S. per capita energy consumption is approximately 330 million BTU per year. This compares to less than 150 million BTU for Europe.

Due to its very high per capita energy consumption, the U.S. has enormous potential to implement energy efficiency measures. Studies show that with proper policy incentives and the resulting acceleration in energy efficient investments, the market could grow to \$700 billion in 2030—nearly doubling its current size.¹ A report by the American Council for Energy-Efficient Economy (ACEEE) highlights that the U.S. can cost-effectively reduce energy consumption by at least 25-30% over the course of the next 20-25 years.

Following the regulatory model for improving the efficiency of automobiles, the U.S. is making progress in building efficiency by instituting policy benchmarking. This can only be done if the U.S. first takes the step of actually measuring current energy use. No doubt many people remain oblivious to how efficiently or inefficiently their homes and businesses consume energy.

Enlightening the masses through innovations such as metering devices is essential for the future, but financial markets already see the possibilities. In 2009, the number of financing rounds in the American energy efficiency category — including technology areas such as smart grid and residential and commercial energy management solutions — grew in absolute terms. According to recently released data from Dow Jones VentureSource, energy efficiency claimed 61 out of a total of 193 clean-tech venture funding rounds in all of 2009. This is a year-over-year increase of 11%, making it the number one area of cleantech deal activity.

The energy efficiency category share of total financing activity in 2009 rose to 32% from 24% the previous year. Concurrently, the share of financing rounds directed to the more capital intensive energy generation sector fell from 30% to 18%, and the share of deals focused on biofuels declined from 13% to 8%. *Continued on next page..*

A recently completed KPMG survey found that venture investment is shifting more toward energy efficiency, and slightly away from renewable energy production. Thirty-eight percent of respondents said the energy efficiency sectors would see the most investment, up five points from last year's survey. Only 30% expect renewable energy to lead, a drop of 6 points from the 2009 survey.

The trend to energy efficiency is being led by the venture capital community. According to Ernst & Young, the U.S. energy efficiency sector received the most VC investment in Q4 '09 with \$252.8million and 22 deals, compared to \$133.7million and 14 deals in Q3 '09. The EE sector raised \$593.3million for all of 2009. The largest cleantech VC deal in Q4'09 in EE and across all cleantech segments was the \$105million investment in Silver Springs Networks Inc, a Redwood City, CA-based provider of networking infrastructure and services for smart grids.

By comparison over the same period (Q4 '09), the energy generation sectors (solar, wind, biomass, biofuels) received \$118.5million of investment with 11 deals executed during the quarter, down from the \$316.5million invested in 8 deals in the prior quarter. This trend is expected to continue in 2010 as many private investors shy-away from the significant up-front capital demands of solar, wind and biofuels opportunities. The information technology component of the EE sector will likely attract increased activity from traditional IT-focused VC firms.

Building Sector to Lead the Way

Electricity production used by buildings is responsible for the largest share of U.S. CO2 emissions. Today, the United States' 114 million households and 4.7 million commercial buildings account for nearly 40 percent of total U.S. energy use and are bigger consumers of energy than the transportation or industry sectors.²

Once benchmarking is possible and in use, it will trigger a market-based competition to own and operate the most energy efficient buildings.³ According to the Institute for Market Transformation, several cities and states already use benchmarking and disclosure mandates. Utilities in California must provide data for use in ENERGY STAR benchmarking. Commercial building owners disclose ENERGY STAR benchmark data to prospective tenants, buyers and lenders. On the federal level, the Department of Energy has a new National Building Rating Program to create a label for homes.

LEED (The Leadership in Energy and Environmental Design) is a Green Building rating system developed by the US Green Building Council (USGBC) in 1998 and has been a significant accelerator in the development and adoption of energy efficiency technologies. Today, LEED consists of a suite of nine rating systems for the design, construction and operation of buildings, homes and neighborhoods. These ratings range from "Certified" to "Platinum" and have become symbols of competition amongst building owners and operators to meet popular demand to "Go-Green". LEED is accelerating the adoption of energy efficiency technologies in buildings through promised increased worker efficiency and energy cost-savings, as well as tax incentives offered by certain states. Program incentives include tax credits, tax breaks, density bonuses, reduced fees, priority or expedited permitting, free or reduced-cost technical assistance, grants and low-interest loans.

Rise of an Energy Efficiency Market

On a state-level, Connecticut, Pennsylvania, and Nevada are instituting policies to create a new tradable attribute equal to the value of energy conserved at facilities. These so-called energy efficiency credits (EECs) are created through the implementation of energy conservation projects and state mandates that require utilities within the state to purchase these credits. The markets serve to create minimum demand, guarantee certain buyers, and institute a price floor. The credits may then be traded across states, sold to corporations, or even offered to the federal government to compensate for their energy over-consumption.

The burgeoning EEC market could get a major boost if energy legislation currently under consideration in the U.S. Congress moves ahead. Climate change legislation authored by Congressmen Henry Waxman (D-CA) and

Edward Markey (D-MA) includes provisions for a national renewable energy standard. This provision would mandate 20% of all the power sold in the U.S. come from renewable sources by 2020. If states have difficulty meeting this mandate, however, they may appeal to the Federal government to allow their electricity sellers to use EECs for up to 25% of this obligation. A similar provision in an energy bill crafted by Senator Jeff Bingaman (D-NM) has a renewable energy standard of 15% by 2020, and approximately 26% of this obligation can be met with EECs.

The fates of both programs are tied to that of the larger climate bill, which is currently winding its way through the U.S. Senate.

India a Growth Story

While the energy efficiency opportunities in the U.S. are substantial, India's demand for raw energy creates its own unique set of issues. India is the second fastest growing economy in the world. Aggregate demand for energy within India is expected to more than triple in the next two decades, much of it met by plants powered by low-BTU local coal. Given that approximately 40-50% of the Indian population does not have access to electricity, simply creating energy in the first place is top of mind. If this can be done in an efficient manner, all the better to save costs and help mitigate increasing environmental concerns.

On a per capita basis, India is more efficient than the U.S., consuming just 15.9 million BTU per capita, according to the EIA. Of course this statistic is a bit distorted given the number of Indian citizens who consume little to no energy.

The Indian government estimates it is still possible to save 5-10% of energy by implementing better housekeeping measures, and another 10-15% is possible with small investments such as low cost retrofits, use of energy efficient devices, and demand controls.⁴

However, real savings will have to come from the industrial sector, which consumes about half of the total commercial energy available in India. In fact, 70% of the sector's consumption comes from energy-intensive industries, such as fertilizers, aluminum, textiles, cement, iron and steel. An approximate 15-25% of this energy use is avoidable, and the incentives are in place for a change in behavior to consume energy in a more prudent manner. Indian industries pay some of the highest energy costs in the world. Many use expensive backup diesel generators because the supply of power from the grid is unreliable and of poor quality.

According to data from the Indian Ministry of Power, the investment potential for energy savings amounts to US\$9.8 billion with annual savings of 183.5 billion kWh. Those energy savings would equate to 148.6 million tons of avoided CO2 emissions per year. The quantity of savings is even higher with increased investment (major retrofit, process modifications, etc.)

Investment Struggles to Keep Up

This considerable potential for energy efficiency has led to investor interest in funding the sector, but capital has been slow to catch up.

Energy efficiency technologies proven to be suitable for India include smart-lighting installation, motor control technologies, and co-generation systems, all of which can reduce energy consumption and reduce operating costs. Energy Service Companies (ESCOs) are expected to play a major role in facilitating the roll-out and adoption of EE technologies and services in India.

Venture capital investment in energy efficiency has been slower to catch on in India than in the U.S. However, momentum is expected to increase over the next several years as more and more institutional investors recognize India as a growth market worthy of new investment. According to the Cleantech Group LLC, Indian companies raised \$million190 million in VC investment in 2009, down 13% from \$218 million in 2008million. There were 17 deals total in 2009, the same number as in 2008.

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In contrast to the U.S., the Indian cleantech sector attracting the most capital in 2009 was energy generation -- specifically biofuels. This sector accounted for 55% of the total dollars invested during the year. There was also significant investment interest in the manufacturing/industrial sector, especially in smart production, agriculture, and natural pesticides. The most active VC investors in 2009 were U.S.-based New Enterprise Associates, which invested in energy storage and recycling companies.

ESCOs Play Vital Role

One significant step forward for India was the Energy Conservation Act of 2001. The Act empowered the union government to prescribe energy consumption norms to industries and direct consumers to appoint certified energy managers for efficient use of energy. It also established the Bureau of Energy Efficiency which coordinates consumers and agencies to improve existing infrastructure. The ESCO industry is expected to can play an important role in realizing energy savings and providing financial returns in India. ESCOs provide energy efficiency-related services on a performance contracting basis, and generally, the compensation for the ESCO is directly linked to the amount of energy actually saved by the client over a specified period of time. Often the ESCO assumes the risk that the project will save a guaranteed amount of energy. This mechanism gives ESCOs a strong incentive to maximize energy savings through the implemented measures. Compared to similar industries in U.S., Brazil and China, the Indian ESCO industry is relatively small, but has grown quickly over the past five years. Several ESCOs currently operate in India and include among others, Honeywell, Pranat Engineering, Energetic Consulting, Blue Star, and Asian Electronics.

The growth of the ESCO industry has led to investor interest in funding the energy efficiency sector. For example, Tribi Embedded Technologies, a New Ventures India finalist company, received \$2.5 million in equity funding in 2008 from Sequoia Capital, an international VC firm.

The growth of the global carbon markets has also fueled the growth of the energy efficiency industry within India. Energy-efficiency projects approved under the United Nation's Clean Development Mechanism carbon offsetting scheme already comprise India's second-largest source of carbon credits after renewable energies. These projects include waste heat recovery projects undertaken by iron and steel producers, as well as projects to improve the efficiency of traditional power and industrial plants.

While global carbon markets have proven an effective catalyst for energy efficiency in India, the country's policy makers are turning to a domestic EEC market to drive investment. Similar to programs proposed in the U.S., India intends to create a market for EECs that could reach \$16 billion by 2015, according to Business Week.

India hopes to have specific energy-efficiency targets in place by the end of 2010 for more than 700 industrial units that account for 40% of India's fossil fuel use. The contemplated cap and trade system would allow companies exceeding certain benchmarks to sell credits to companies that don't meet them. Additionally, talks are under way with Indian Energy Exchange Ltd. and Power Exchange India Ltd. to devise trading procedures.

Furthermore, the government program outlines plans for a fund that would provide partial loan guarantees for energy-efficiency projects, while a separate venture capital fund would be created to support companies that manufacture energy-efficient products and provide related services in the sector. Stay tuned; Indian policy is rapidly evolving with numerous favorable programs on the horizon.

Two Nations, One Common Goal

At its core, energy efficiency is about getting more out of less; a common theme amongst homes and businesses in this economically challenging period. In order to truly stimulate the implementation of wide-scale energy efficiency measures, policymakers in both the U.S. and India must craft the appropriate incentives. The domestic realities of each country call for different approaches.

While half of India's population does not enjoy access to electricity, policy must balance the need to reach the masses and curb pollution, while not overly restraining economic growth. India must rely on its recently established benchmark to bring industrial efficiency up to speed and hope the tradable mandates will positively effect markets. On the other hand, the U.S. must rally its people to reduce energy consumption at home and in buildings and respond to market-based incentives.

For more information on investment and market opportunities carbon credits from forestry projects or to explore investment opportunities, please contact Evolution Markets Merchant Bank carbon finance specialists at +1 646.200.7700 or the Evolution Markets Global Carbon Markets Team at +1 914.323.0265 or +44 (0) 20. 7264.4550.

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