

Building Energy Efficiency – Today & Tomorrow

Report from TiE Bangalore Clean Tech SIG Event

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November 2010

The market for energy efficiency innovations is all set to be tapped as governments and various other stakeholders have turned their focus towards energy performance and conservative measures. Energy Efficiency in commercial buildings will be a major focus area considering the real-estate growth and the fact that buildings account for an estimated 30 percent of the total energy consumption in India.

TiE Cleantech SIG hosted an event on opportunities in Energy Efficiency in Commercial Buildings on November 18, 2010 at Electronic City campus of Infosys, the host and sponsor for this event. This event focused on the current state of Energy Efficiency in Commercial Buildings and discussed the innovations and future opportunities in this sector. Speaker included Dr. Vihsla Garg, Head, Centre for IT in Building Science at [IIIT Hyderabad](#), Manish Pant, Director of Strategy & Alliances at [Schneider Electric India](#), A. Vaidyanathan, Founder & MD of [HMX Systems](#), and Rohan Parikh, Head of [Green Initiatives at Infosys](#). The event was attended by 40+ enthusiastic entrepreneurs and professionals interested in or working in this energy efficiency sector, and provided a very stimulating Q/A session with the speakers. Several business ideas were highlighted during the discussions and the audience went away with a good sense about the opportunities and future of energy efficiency in commercial buildings. Here are some of the highlights and summary of the discussion.

Some facts:

1. Excellent growth in green building sector – number of certified building increased from 1 in 2003 to 120 in 2010, while the number of registered building grew from 1 in 2003 to 727 in 2010. More CXOs and senior management now involved, and thousand-fold growth in number of certified LEED consultants over the same period of time.
2. 70% of buildings of 2030 haven't yet been built, the top 20 software companies will build out/occupy 200 million sqft of office space in the next 3 years – where's the power going to come for this expansion?
3. Energy demand will grow 4-fold by 2050, whereas CO₂ emissions must be reduced by half to avoid dramatic climate change.
4. BEE star-rating in place. ECBC to soon become mandatory – how soon is being debated.
5. The catalysts for energy efficiency are many-fold – National Mission for Enhanced Energy Efficiency (NMEEE to unlock INR73000 Cr market by 2015), CO₂ Emission reduction targets (98.55 million tons annually), promotion of

- Green Building construction, increasing energy price, increased use of electric cars, 1 billion participants in Earth Hour (BTW, TiE Bangalore SIG has contributed significantly to it for last two years:-), shorter payback on investments, tax incentives, and increased awareness.
6. Expanding EE domains – EE services, Smart grids, Demand response, Performance contracting, and carbon services.
 7. Carbon foot print of IT companies: (1) Electricity (75%) with HVAC (45%), Lighting (10%), Computers and Data centers (40%), Misc equipment (5%) and (2) Mobility (25%) with Business travel (68%), Employee commute (32%).
 8. Infosys goals: 10X Improvement target in EE over 2007 levels, Sourcing energy from Green Utilities to become Carbon Neutral, Be water and waste neutral (RWH, Recycling, Onsite organic waste processing), plant one native tree for every new employee to increase bio-diversity.
 9. Infosys is well on its way to achieving its goal of reducing power consumption by 90%. Extensive data collection with meters at various system and sub-system levels. To understand and monitor energy consumption pattern, and used to design new buildings. ROI for such expenditures is only a few days, not months or years! Data is also used to drive AMCs and achieved savings much higher compared to metering cost.
 10. Infosys has used several 'out of the box' concepts and basic 6th grader physics to achieve some the feats – such as smart power-strip design embedded with sensors, wi-fi, sms, etc. to monitor and control power consumptions, radiative cooling to reduce heat loads, passive designs, daylighting, and use of simulation for lighting and cooling designs.
 11. HMX Systems has developed an ambiator – an energy efficient alternative to air conditioning, achieving about 90% of air conditioning effectiveness at 1/3 rd energy cost! HMX essentially found a way to 'connect-the-dots' – the relationship between Thermal comfort, Energy, and Environment and converting it to the other three dots – Product, Market and Solution.

Some of the Challenges, Potential and Opportunities:

1. A conservative market opportunity worth INR 10,000 Cr per year.
2. There is a lack of rating institutions – we need to build more such institutes – start-ups face this challenge even more as they don't have resources to build these on their own.
3. There is lack of financing. But there are several attempts in process to address this. Also, Schneider has created 'SE venture fund' and 'Access to Energy' fund for EE start-ups and end consumers.

4. Measurement and verification services – the country is severely short on these facilities and services. There is a barrage of consultants for energy audits and service providers, but scarcity of service provider to measure and verify post installation.
5. Certification services – support customers to receive official certification on energy and emission performance.
6. Products & Weather data – material testing labs, weather data.
7. Performance contracting – provide approach and financing for energy efficiency improvement on customers' behalf with guaranteed/non-guaranteed saving commitment
8. Demand response – consulting, measurement and verification analytics, energy aggregation, NOC management
9. Product energy optimization – deliver production data used in energy forecast modeling, generate energy forecasts and track against production execution.
10. Technological opportunities – simulation software development, interface development for energy simulation software, software for integration of workflow
11. Integrated solutions – interoperability and openness to third party systems – building management, HVAC & lighting control, energy monitoring, motor control, electrical distribution, critical power and renewable energy.
12. Training services – provide trainings on energy and emission management to support sustainable implementation of energy efficiency. This also addresses the start-up challenge of unavailability and inability to attract quality manpower.
13. And the major challenge as summarized by Vaidy through a Haitian proverb – 'Beyond the mountains, there are mountains again...!'
14. Behavior change is a must in order to achieve EE. EE and RE are not mutually exclusive – you must use EE whether or not you opt for RE. EE is savings, and we are today spending more than what we have – therefore, EE, RE, and all green initiatives are key to our future.

Best wishes for a great opportunity in energy efficiency!!