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THE INNOVATION ECONOMY -- MANAGING FOR INNOVATION

Reaping The Wind

GE's energy initiative is a case study in innovation without borders

Even before Aeolus controlled the tempestuous winds in Greek mythology, humans have dreamed of harnessing such power for themselves. But as a source of energy, the wind business is in its youth, populated mostly with niche players trying to build markets in a world where policies, cost, and technology still favor traditional forms of energy. General Electric Co. (**GE**) is setting out to change that equation by applying its considerable financial and technological muscle to the field. It launched GE Wind Energy in May, 2002, when it bought Enron's wind businesses after the company's collapse.

What makes GE such a force for innovation in this nascent industry is its ability to harness a vast array of global talent to develop new products and new technology. The \$134 billion giant already has people developing sophisticated composites that allow for lighter, stronger blades in jet engines. It has experts in the rail business who know how to make gearing systems operate at peak efficiency, and others who have vastly improved the efficiency of power turbines. And it can bring that talent together at major research centers in Shanghai, Munich, Bangalore, and upstate New York that serve all GE businesses.

While many companies boast a global workforce, few are as skilled at mobilizing experts from diverse disciplines and locales in pursuit of a common goal. The difference stems from culture more than from technology. At GE, executives are encouraged to think beyond the boundaries of their particular business. They come together frequently for training or joint projects. Executives are apt to move among units several times in their careers, letting them build up a rich network of internal contacts. There's also a tradition of plucking people from their day jobs for other projects. At any given time, thousands of GE employees are on so-called bubble assignments -- lending their skills to another function or business that pays their salaries for the duration of the project.

Moreover, GE doesn't treat its global outposts as farm teams for U.S. operations. Yes, there's cheaper labor in places like Bangalore and Shanghai. But foreign researchers also handle high-level autonomous research projects that match anything being done at home. GE has set up state-of-the-art training centers to school foreign employees and customers in the GE way. The GE China Learning Center in Shanghai, for example, boasts many of the features of GE's famed training facilities in Crotonville, N.Y. -- including classrooms for up to 178 people.

That backdrop has been critical to building up GE's market share in wind energy. It's now a \$9 billion global industry that's expected to grow 10% to 15% a year, says Steven Zwolinski, who heads up the wind business, now a part of GE Energy. The unit sold \$1.3 billion of energy-generating equipment last year to major utilities and developers. As technical innovations bring the cost of producing wind energy down and governments become more eager to develop renewable resources, growth could accelerate.

Certainly, that's the expectation of James Lyons, a chief engineer at the GE Global Research Center in the leafy residential town of Niskayuna in upstate New York, who is charged with handling the advanced technologies for wind.

MULTILINGUAL MIND MELD

Lyons is the fulcrum for the project, charged with marshalling talent from around the world. The 30-year veteran has brought in engineers from other units and navigated cultural hurdles worldwide. Through his extensive internal network, he knew the people and skills he wanted. He has recruited materials experts from down the hall who developed the composites for the fan blades of the GE90 aircraft engine; design teams in Greenville, S.C., and Salzbergen, Germany; engineers from Peterborough, Ont., who are tackling the generators; Bangalore researchers who are crafting analytical models and turbine system design tools; and Shanghai engineers who conduct high-end simulations. Lyons keeps his team focused with e-mails, teleconferences, and clear deadlines.

Still, trying to nurture world-class research outside the U.S. also creates a host of challenges. First was the nervousness of the talent in Niskayuna. They know all too well that their counterparts in Shanghai and Bangalore are making a fraction of their U. S. salaries, although Sanjay M. Correa, the global technology leader for energy and propulsion at GE Research insists such tensions dissipate once they realize that the new colleagues are additions rather than replacements. With younger employees at the new centers, there are more questions and less familiarity with the GE way. Still, Bansil Phansalkar, a technology leader at the Bangalore center, says "we all speak the same language of technology."

One way to build team spirit is to foster familiarity. In addition to regular teleconferences, engineers take stints working in other parts of the operation. That has meant trading engineers from Bangalore and Salzbergen, for example, for a week or two at a time. Along with learning about the core design tools being created in Bangalore or the actual products being made in Salzbergen, they establish better lines of communication.

The far-flung team is getting results. Among the innovations so far: a new generation of land-based wind turbines with capacities of more than 2.5 megawatts (at a typical price of \$1 million per megawatt) with new blade and advanced control technologies -- a boon for customers who want to generate energy on sites where space is limited. GE's 3.6 megawatt unit, which produces enough electricity to power 1,400 average American homes a year, is designed for offshore locations. Its turbine -- with blades each longer than a football field -- sits 30 stories above the ocean. Current projects range from a wind farm in Inner Mongolia to working on smaller turbines that could help provide clean water to villages in developing countries. "There are a lot of wild and crazy ideas in the wind industry," Lyons says with a laugh. "But there is an incredible amount of pent-up demand as well." And GE staffers around the world are determined to capture as much of that demand as possible.

By Diane Brady

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