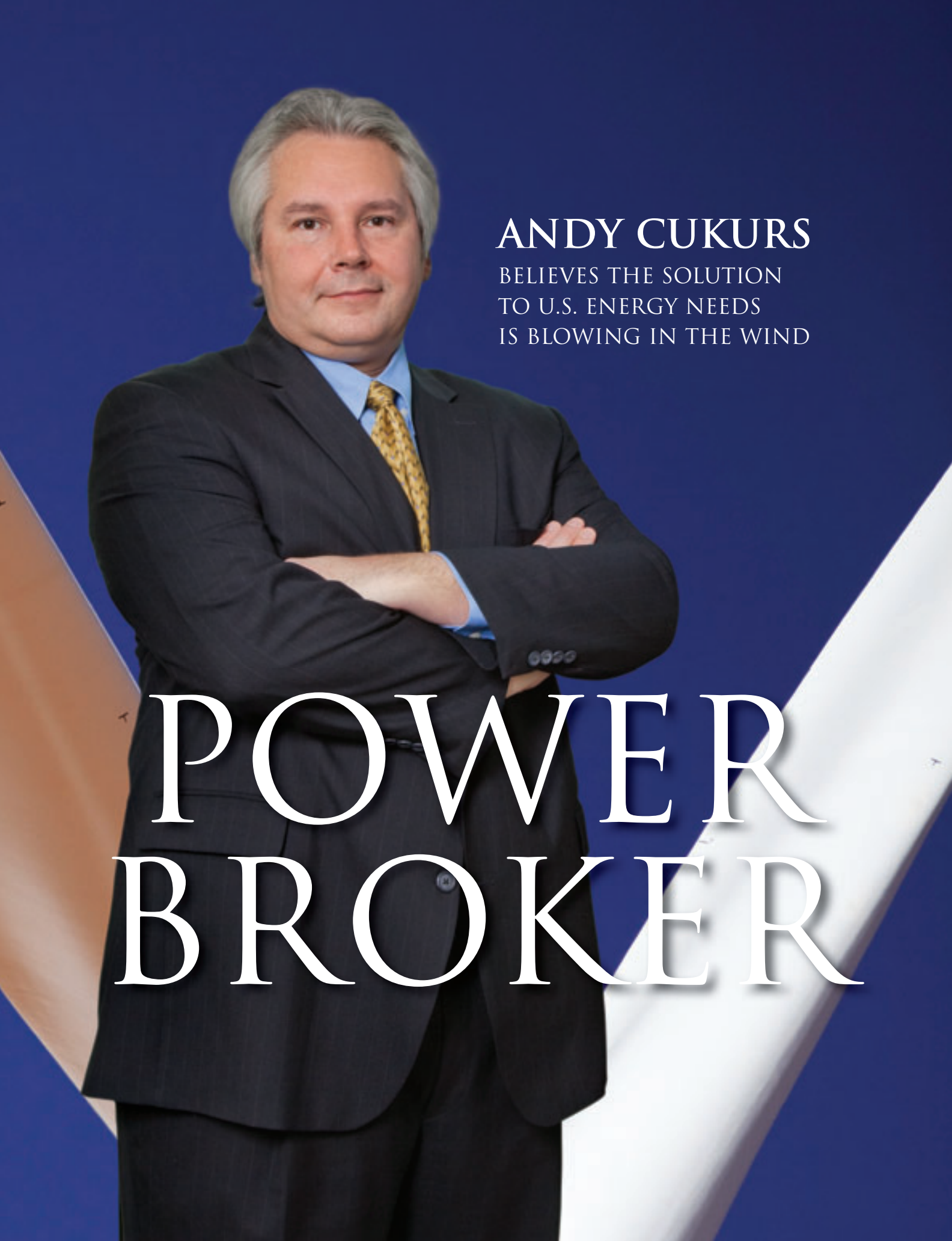


ANDY CUKURS

BELIEVES THE SOLUTION
TO U.S. ENERGY NEEDS
IS BLOWING IN THE WIND

POWER BROKER

BY DEBORAH L. COHEN

It's a late summer day in Princeton, and a breeze has begun to blow. Four wind turbines, each towering more than 20 stories, make a gentle swishing sound as they slice against the open sky. Soon their 140-foot-long blades will reach sufficient speed to power a nearby generator and grid.

Gazing upon the larger array of wind turbines dotting this small farming community stands **Andris "Andy" Cukurs '85** ENG, CEO of the U.S. division of India's Suzlon Energy Ltd. "Look how close the farms are," he observes. "The [turbines] require virtually no land."

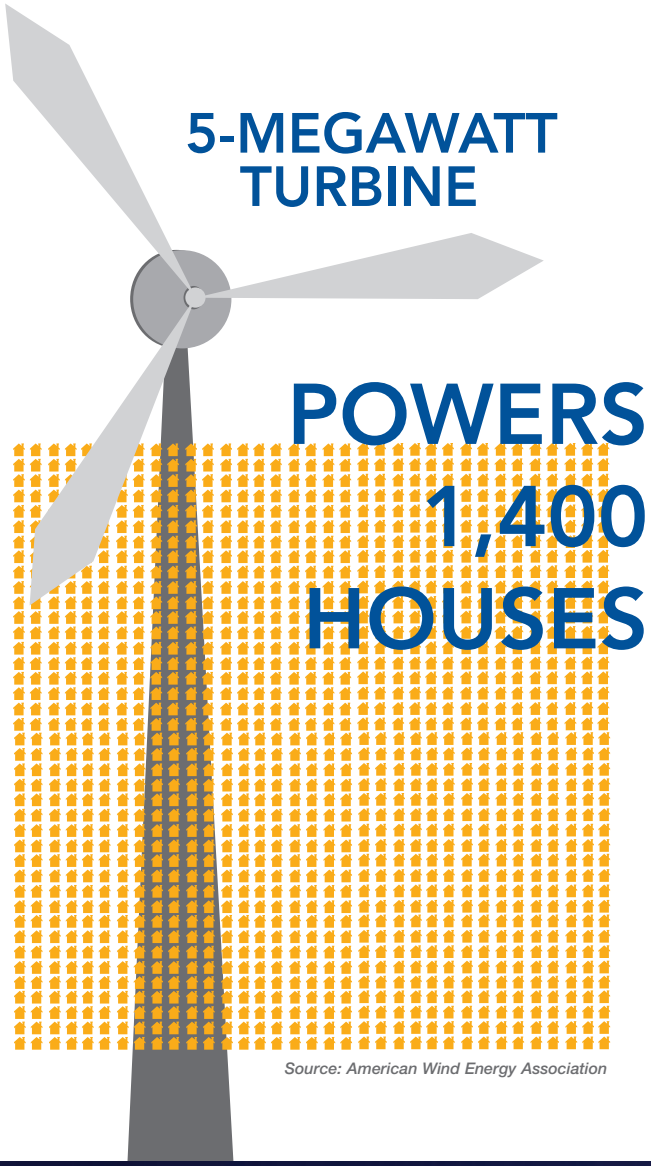
And Cukurs requires no introduction to the green-energy market, having transformed Suzlon's small U.S. startup into a $1 billion up-start in a mere six years. Today, he oversees 22 offices and 450 employees, as well as 48 wind farms in 15 states, including Texas, Iowa and Minnesota, all major markets for wind-powered energy.

Once the turbines are built and installed, the fuel cost is free, says Cukurs. "Operating costs are minimal."

The rewards, meanwhile, are immense, or potentially so. The wind powers not only generators, but new jobs, revenue streams and tax breaks for places like Princeton, all while reducing the nation's dependence on potentially harmful fossil fuels. Or so Cukurs explains.

His command of nearly every aspect of this nascent technology, from standards and statutes to financing and engineering, comes as no surprise to Howard A. Learner, president of Chicago's

Photos courtesy of Suzlon Wind Energy Corp. unless otherwise noted



Source: American Wind Energy Association

Environmental Law and Policy Center. "He's a guy from Chicago," says Learner. "He understands how things work."

And how to work with people. With his booming laugh and relaxed personality, Cukurs is known for his affable, down-to-earth demeanor, whether he's suited up for a day's work at Suzlon's headquarters in Chicago or trading stories in the field with a service technician.

He has put his abilities to good use. Despite flagging economic conditions, he has scored major supply contracts with John Deere and Edison Mission Energy.

A PROJECT GUY

The son of Latvian immigrants, Cukurs seemed destined for big doings since boyhood, which he spent on Chicago's Northwest Side. He recalls that his father, a structural engineer, worked on massive facilities for the likes of Swift & Co., and took great satisfaction in seeing them rise from the Midwestern prairie.

"It was pretty intriguing for a young kid," recalls Cukurs, who remembers his father poring over blueprints, but always willing to stop and explain how something worked. While driving to family vacations in Michigan, he would point out refineries that he had a hand in building.

Upon graduating from UIC, Cukurs embarked on a similar path, working on food plants and other large projects while employed as an engineer with APV Crepaco Inc. To hone his management and financial acumen, he returned to school and earned an MBA at the University of Chicago.

Degrees notwithstanding, he remains a self-described project guy. "I built ice cream plants in Moscow, Gatorade plants in China, breweries in Korea, sake plants here in the United States.

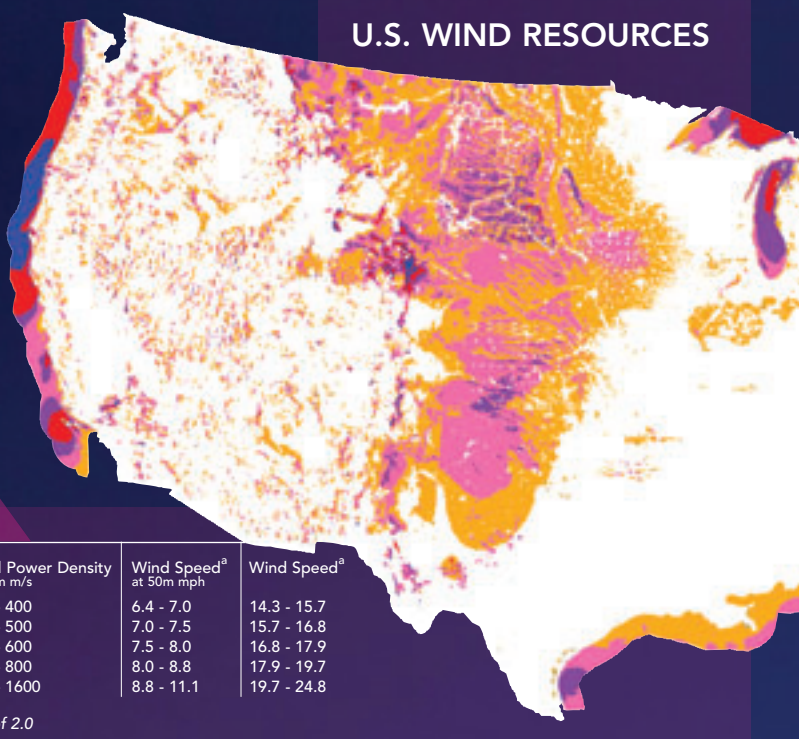
PRAIRIES AND SHORELINES MAKE THE BEST SITES FOR WIND-TURBINE FARMS

Developers don't decide where to locate renewable power plants. Nature does.

Solar power derives from the sun, which is why solar power plants are more likely to spring up in San Jose than Seattle. Similarly, wind turbines flourish in windy environments such as shorelines and prairies.

There are plenty of both in the United States, where wind-power capacity grew at an average annual rate of 32 percent from 2003-08—sufficient to make it the world's largest market for wind-powered energy, according to the American Wind Energy Association.

Steady wind regime is critical to selecting a site, though by no means the only consideration,



WIND POWER CLASSIFICATIONS

Wind Power Class	Resource Potential at 50m W/m²	Wind Power Density at 50m m/s	Wind Speed[a] at 50m mph	Wind Speed[a]
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8

[a] *Wind speeds are based on a weibull k value of 2.0*

Source: American Wind Energy Association

As CEO, Andy Cukurs has helped transform Suzlon Wind Energy Corp. from a start-up into a $1 billion enterprise, with 48 wind farms in 15 states, including Illinois, Texas and Minnesota.

Every process or factory was unique. There was always some new challenge associated with it."

His appetite for variety eventually landed him in the wind-energy market, where he encountered variables as diverse as weather, wind regime and topography, and power lines, population density and policy.

His first foray came by way of a former boss, who recruited him in 1998 to develop U.S. capacity for NEG Micon, a Danish manufacturer of wind turbines. Cukurs oversaw operations and the construction of two plants. In the process, he helped make NEG an attractive takeover target. In 2004, Vestas, another Danish interest, acquired the company.

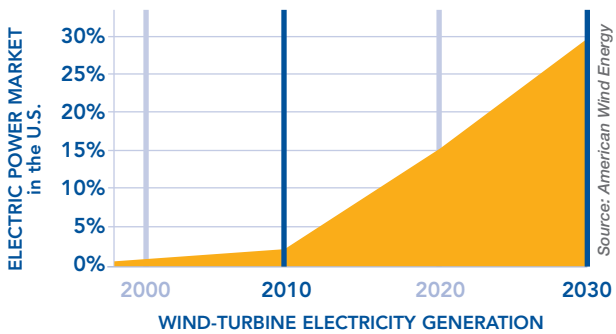
"We built up a credible organization," says Cukurs, who nevertheless found himself out of a job.

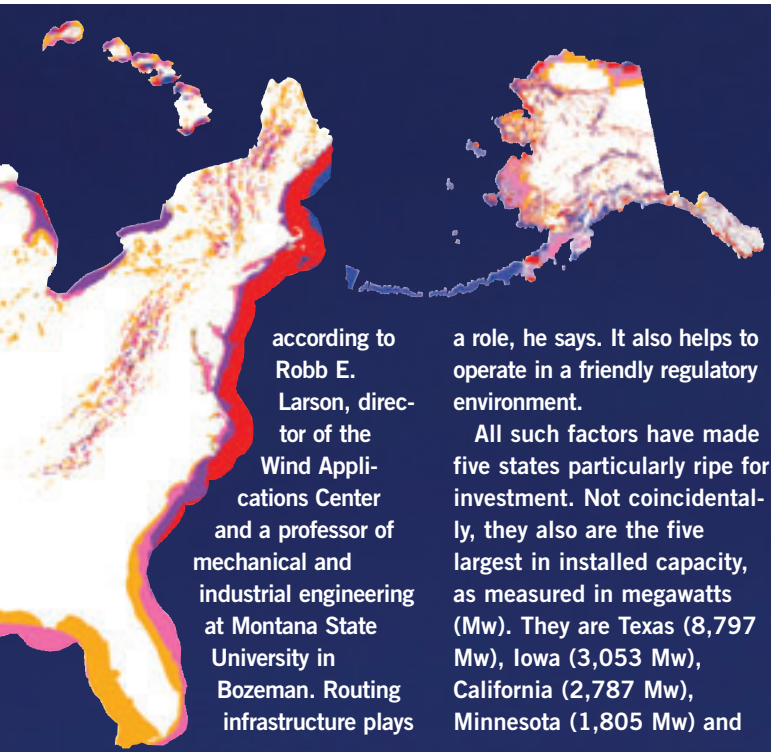
It wasn't his last encounter with adversity. In recent years, market prospects for wind turbines have dimmed as a result of a prolonged recession, declining energy prices and diminishing investment.

Cukurs, however, continues to build consensus among banks, developers, utilities and politicians in places like Princeton. "He understands the linkage between job creation, economic development and environmental issues," says Learner.

"I see him as a visionary," says David G. Loomis, director of the

PROJECTED GROWTH





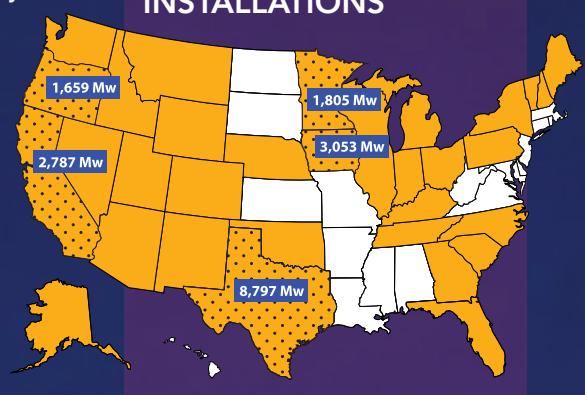
according to Robb E. Larson, director of the Wind Applications Center and a professor of mechanical and industrial engineering at Montana State University in Bozeman. Routing infrastructure plays a role, he says. It also helps to operate in a friendly regulatory environment.

All such factors have made five states particularly ripe for investment. Not coincidentally, they also are the five largest in installed capacity, as measured in megawatts (Mw). They are Texas (8,797 Mw), Iowa (3,053 Mw), California (2,787 Mw), Minnesota (1,805 Mw) and Oregon (1,659 Mw).

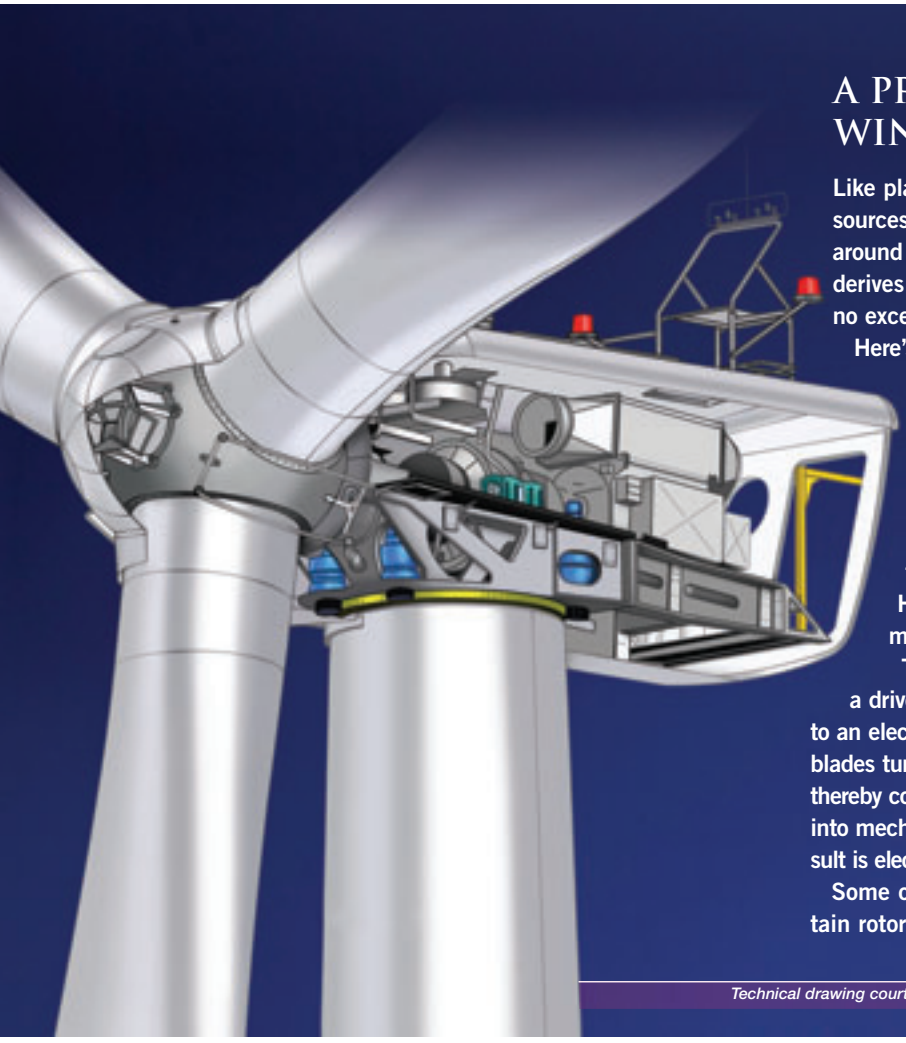
Arizona saw its first utility-scale wind farm erected in 2009, bringing the number of states with similar installations to 36. Illinois, currently ranked ninth in installed capacity, recently joined AWEA's so-called "gigawatt club," following completion of a 201-Mw project.

The U.S. Department of Energy forecasts that the United States is on track to generate one-fifth of its electric power from wind energy by 2030, providing, that is, government policy remains supportive. —D.L.C.

U.S. WIND CAPACITY INSTALLATIONS



Source: American Wind Energy Association



A PRIMER ON WIND-TURBINE TECHNOLOGY

Like planets, seemingly all sources of energy revolve around the sun. Wind, which derives from solar energy, is no exception.

Here's how it works: Windmills, or wind turbines as they have come to be known, employ blades—big blades—to gather the wind that flows over them. How big? Fifty to 90 meters in diameter.

The blades connect to a drive shaft, the drive shaft to an electric generator. As the blades turn, so does the shaft, thereby converting kinetic energy into mechanical energy. The result is electricity. It's that simple.

Some offshore turbines contain rotors as large as 110 meters in diameter. Why that size? Power output is contingent upon it, along with wind regime and geography.

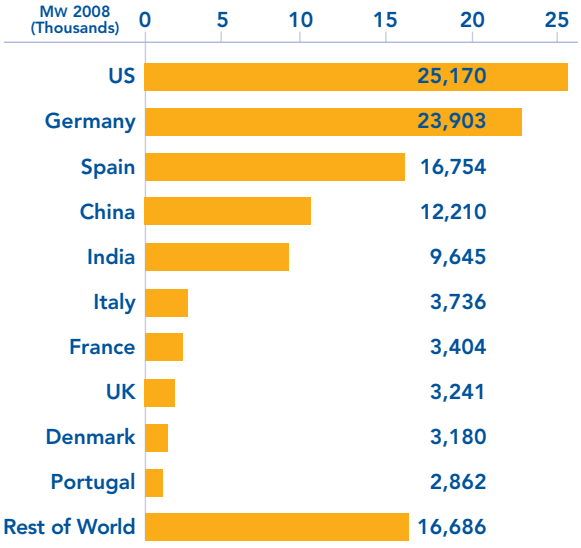
The turbines may be big, but their power output is measured in very small units known as watts. The power industry bundles them into units known as kilowatts, the same as 1,000 watts. Hence, the expression kilowatt-hour, meaning the number of watts produced each hour.

Today's turbines customarily carry power ratings of 250 watts to 5 megawatts. A 5-megawatt wind turbine can generate more than 15 million kilowatts per year, or enough to service 1,400 homes.

Wind farms vary in capacity, from just a few megawatts to hundreds. Either way, it's a lot of power. —D.L.C.

Technical drawing courtesy of Suzlon Wind Energy Corp. Source: American Wind Energy Association

INSTALLED CAPACITY BY NATION



Source: American Wind Energy Association

Center for Renewable Energy and an associate professor of economics at Illinois State University, where Cukurs has served as an advisor and helped develop an undergraduate major in renewable energy.

"He was the first to say the industry is going to boom and we're going to need a huge workforce in place," adds Loomis.

Jesper Michaelsen, a former sales and marketing executive with NEG, recalls that Cukurs joined the fray at a time when wind power was considered an oddity. "The market was completely different, not nearly as developed," says Michaelsen, now a senior project manager with Vestas. "He convinced NEG that it needed to be customer-focused—that it needed to establish that focus from the outset."

Cukurs brings similar conviction to Suzlon, which recently overtook Spanish competitor Gamesa as the nation's fourth-largest supplier of installed wind power, immediately behind German powerhouse Siemens, according to the American Wind Energy Association.

It hasn't been easy. In 2007, Cukurs learned that hundreds of Suzlon blades installed in the United States were cracking, the result of a design flaw. The company immediately embarked on a two-year, $100 million remediation effort that required replacement or repair of 969 blades. "It was quite an undertaking,"

says Cukurs, who notes that Suzlon established three regional "hospitals" in order to expedite repairs.

WINDS OF CHANGE

Cukurs can recite all the projections and statistics, including those that suggest that wind power could account for 30 percent of U.S. electricity by 2030, if U.S. Department of Energy projections are on target. He also knows that wind energy currently accounts for only 2 percent of the electricity generated in the United States.

So he and his colleagues have their work cut out for them, and under conditions that find new competitors—including Germany's Nordex, Japan's Mitsubishi and several new Chinese companies—exerting downward pressure on pricing.

"It's becoming more and more difficult to compete," says Keith Hays, global wind research director with Cambridge, Mass.-based Emerging Energy Research. "There's an oversupply of turbines."

Increasingly, wind turbines have come under attack from some environmental groups, such as Rowe, Mass.-based National Wind Watch. NWW cites objections ranging from the killing of migratory birds to deforestation.

"The main thing is to make sure people know that there are adverse impacts," says Eric Rosenbloom, NWW president. "These are huge machines. They dominate the landscape. They require huge concrete platforms, heavy-duty access roads; they make noise, they require transmission lines."

Even with these challenges, the future for wind-turbine power looks bright. The Obama administration has redoubled efforts to reinvigorate renewable energy. It also has indicated that wind is its alternative energy source of choice.

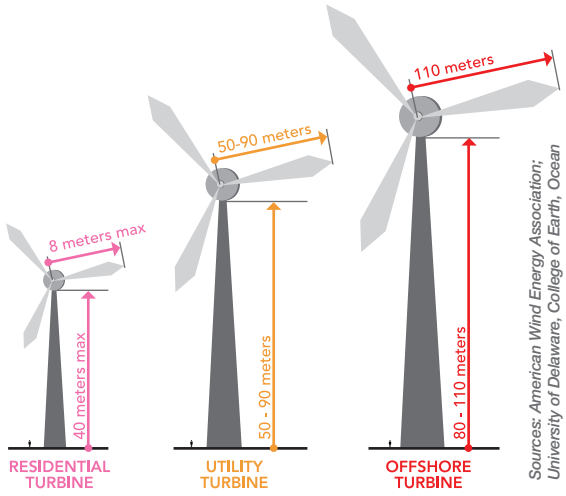
What we need is "a national renewable energy standard," explains Hans Detweiler, director of development for Houston's Clean Line Energy Partners and AWEA's former director of state policy. "It would certainly add teeth to the market."

Cukurs, meanwhile, continues to do what he does best, including recruiting and developing new talent, and allying with local colleges and universities in order to do so.

When time permits, he can be found back in communities such as Princeton where, on this late summer day, he confers with his technician, listening avidly as the young man explains how the creation of wind farms in his home state of Iowa has led to additional jobs and increased funding for local schools.

"It's not a Republican thing or a Democratic thing; people are generally supportive of renewables," says Cukurs. "Communities such as this are going to benefit from it."

When they do, look for Cukurs to be there, standing among turbines on the windswept prairie. **UIC**



Deborah L. Cohen

(Top) Because of their weight and large dimensions, wind-turbine components are frequently transported by rail to staging yards. (Bottom) Cukurs confers with a Suzlon technician at a wind-turbine installation in Princeton.