

# Big ideas for tiny windmills at UTA

energycentral | Posted: 04 Mar 2014, 10:47

 Share: [f](#) [t](#) [g+](#) [e](#) [p](#)


Millions of tiny windmills could one day power wireless sensors that detect cracks in bridges, failures in security systems and dryness in soils -- all thanks to two University of Texas at Arlington research scientists who were inspired by a little girl's pinwheel.

Electrical engineering professor J.C. Chiao and associate researcher Smitha Rao designed the 1.8 millimeter by 2 millimeter micro windmills that are so small 10 would fit on a grain of rice. The aerodynamic windmills are made of a durable and flexible nickel alloy.

"My heart stopped beating," Chiao said of the first time the team's tiny windmills were tested.

Although several media outlets have reported that the tiny windmills could be used to charge smartphones, Chiao said portable electronics is only one area where they could be useful. Because companies already craft all types of charging devices for cellphones, he said he would like to see the tiny windmills used where energy is needed the most, such as powering wireless sensors located in places where making repairs might be problematic.

An example would be the wireless sensors that monitor bridge conditions. Changing out the batteries on the sensors would be costly and labor intensive. But thousands, or even millions, of windmill-powered sensors could do the job.

"We deploy the wireless sensors in those places and continuously monitor that structure's health. That determines if the bridges and highways should be replaced or repaired and saves us quite a bit of money in the future," Chiao said.

The tiny windmills could power remote sensors that monitor soil dryness in fields, saving water, energy and the environment, he said.

The tiny 3-D structures are built from layers of nickel alloy, and include curved blades that can tolerate small to large amounts of wind. So far, they have withstood a leaf blower.

UTA has a patent pending on the devices; therefore Chiao said he cannot yet say how much energy the devices produce.

## Newsletter Subscription

Your email

 News

 Product Alert

## Most Popular in News

- |   |   |
|---|---|
| <a href="#">FirstEnergy selects Eaton for</a>         | 1 |
| <a href="#">Beech Ridge Energy plans battery</a>      | 2 |
| <a href="#">Wind turbines propel learning at WSUV</a> | 3 |
| <a href="#">Study suggests massive offshore wind</a>  | 4 |
| <a href="#">Galpine completes purchase of</a>         | 5 |
| <a href="#">GE wind turbine lab aims for better</a>   | 6 |

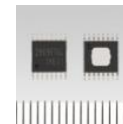
## New Products

### IDT offers WPC 1.1 and PMA 1.1



Integrated Device Technology, Inc. (IDT®) claimed the industry's first dual-mode wireless power receiver compatible with...

### Audio power amplifier ICs for electric



Toshiba Corporation announced the launch of the TB2909FNG an audio power amplifier IC that supports external audible outputs...

### 60V synchronous boost controller



Linear Technology Corporation announced the LTC3784, a high-power two-phase single-output synchronous step-up dc-dc...

### High-power 50-watt zener diodes



The robust 50-Watt devices are engineered to provide voltage regulation protection in a broad array of alternative energy...

## People are Sourcing

"We still need to tweak the design. The first design was based off our intuition, now we need to go back to the drawing board," Rao said.

Chiao's former college classmate, CEO of the Taiwanese foundry company WinMEMS Technologies Co., tracked him down in 2012 after stumbling across the work of fellow researcher Rao. After looking into the devices the company made, Chiao and Rao agreed to partner with them. After watching her 3-year-old daughter Isha play with a pinwheel one day, Rao realized that the origamilike design could work for a tiny windmill.

"Smitha got involved because she has a lot of creative ideas," Chiao said. "She continues to generate creative, crazy ideas, and I love them. She can assemble things in her mind." WinMEMS will work on the commercial aspect of the partnership.

"We still need to evaluate what kind of company we would work with. I hate to rush it. We need to find a good partner," he said. "At the same time we are talking to quite a lot of companies from the U.S., Germany, China, Taiwan and Korea."

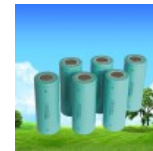
 [Contribute](#)



3600mah Battery C



Dry Test Transfor



Cylindrical Lithi



Cable Gland Reduc



ABB Contactor, AE



Maxell ER3 3.6V

[View All Products >>](#)

## Electric Power



### Substation to help deliver electricity from Belarus nuclear power plant

A substation will help deliver electricity from a Belarusian nuclear power plant to the national power grid.



### Lagerwey Wind: "Humble start with wider ambition"

Lagerwey Wind's first commercial project was the development of a novel 2-MW IEC class IIA direct drive turbine with 82-metre rotor diameter as a license product for an Indian client.



### Dominion line approved to bisect BASF

The State Corporation Commission issued an order Friday giving Dominion Virginia Power permission to cross BASF property with a high-voltage power line.



### Structure Named in Top 14 Smart Grid Company to Watch

Structure™, an industry leader in business advisory and consulting services to the energy and utilities industries, announced that it has been voted to the list of "14 Smart Grid Companies to Watch in 2014" by the readers of Smart Grid News for the third consecutive year.



### Continued positive reliability outlook for Ontario's electricity system

The outlook for Ontario's bulk electricity grid continues to be positive in the near term, the Independent Electricity System Operator (IESO) said in its latest 18-Month Outlook. The report anticipates adequate resources to meet demand throughout the summer of 2014.



### Farooq Abdullah: Free electricity is like cocaine

Abdullah said, "The country has to stop giving electricity for free. It is like giving them cocaine. Once people get addicted to it, you cannot stop it. After every five years (election time), you have to just double the dose of cocaine (to fulfill their desire)."



### BP 'terminating' Cape Vincent Wind Project

BP Wind Energy is pulling out of Cape Vincent after unsuccessful attempts to sell its 285-megawatt industrial wind farm project.



### GE wind turbine lab aims for better way to do job

The lab, the first of its kind for GE, was established here in part to take advantage of the resources GE already has at its Global Research Center in nearby Niskayuna .



### Calpine completes purchase of Guadalupe power plant in Texas for \$625 million

Calpine Corporation has completed the acquisition of a natural gas-fired, combined-cycle power plant located in Guadalupe County, 30 miles northeast of San Antonio, Texas, in ERCOT's south zone.



### Wind turbines propel learning at WSUV

The turbines constitute a new mini wind farm recently installed near the 50th Avenue campus entrance. They are a key component in the 2-year-old renewable energy track in the School of Engineering and Computer Science, a track not offered at any other WSU campus.



### Study suggests massive offshore wind farms could tame hurricane winds

Offshore wind farms with thousands of turbines could lessen hurricane winds and storm surges and possibly prevent billions in damages, a U.S. researcher says.



### FirstEnergy selects Eaton for conversion project to enhance grid reliability

Through this multi-million dollar contract, Eaton's Electrical Services and Systems team will supply turnkey project management and equipment conversions that enhance grid stability and reliability.



### Beech Ridge Energy plans battery storage system at West Virginia wind farm

Beech Ridge Energy LLC applied recently at the West Virginia Public Service Commission for approval to install battery storage systems at its wind farm in Nicholas and Greenbrier counties.



### World Bank changes financing model for 4,800-MW Inga 3 hydropower plant

A report from water resources watchdog group International Rivers said the World Bank has switched development of the 4,800-MW Inga 3 hydropower project from a public sector project to a private one.



### Military wants to zap soldiers' brains with electricity

This lower brain performance often happens when people spend long hours doing dull things like their jobs. The Pentagon, though, believes it has a solution: zap soldiers' brains with small amounts of electricity to keep them alert and focused for longer periods of time.

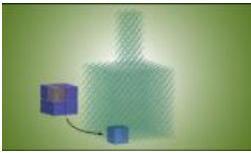
### Electric avenue: car charging stations mushrooming in Marin

According to plugshare.com, there are 44 public charging stations in Marin, and another 27 at private residences that are offered for public use.



### Wind firm pitches proposal to Loup Power

Omaha-based Bluestem Energy Solutions pitched a proposal to the Loup board last week that would allow the local utility to lock in a wind energy rate for 25 years.



### Nanopillars could improve conversion of heat to electricity

Scientists have found a creative way to radically improve thermoelectric materials, a finding that could one day lead to the development of improved solar panels, more energy-efficient cooling equipment and even the creation of new devices.



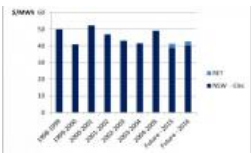
### Project to give farmworkers free electricity

Western Cape farmworkers may benefit from Eskom's free basic electricity grant in the future, provincial premier Helen Zille said in her state of the province speech on Friday.



### Delhi high court stays 50% waiver on pending electricity bills

The Delhi high court on Friday stayed the AAP government's February 12 decision to give a 50% waiver on pending electricity bills of 24,036 consumers.



### Why electricity is not a rip-off

Henry 'The Sky is Falling' Penny is multiplying and out in full song, claiming the demise of Australian manufacturing is down to the, apparently, exorbitant cost of energy in Australia, inflated by the influx of renewables.



### Plant turns Disney food scraps into electricity

The big truck tipped its load, and out gushed a bubbling slop of burger pieces, buns, onions, carrot peels, whole oranges, lettuce bits and much more that smelled as sour as it looked.



### Charge 'sharing' by electric cars could ease strain on power grid

While electric vehicles are good in terms of reduced oil consumption and air pollution they may strain an aging U.S. electrical infrastructure, researchers say.



### Tajikistan's electricity generation in January decreases by 5.2% in annual terms

Total volume of electricity generation in Tajikistan in January amounted to 1.44 billion kWh or an average of 46.5 million per day. Electricity production in January 2014 increased by 1.8% comparing with December 2013 and by 5.2% comparing with January 2013.

### Wind line could blow through Effingham County

A representative of a wind energy company told the Effingham County Board Tuesday that the county could make quite a bit





of money per year if a transmission line passed through the county.



### Duke Energy to sell power plant near Nachusa

Duke Energy announced plans this week to sell all 13 of the power plants in its Midwest generation business, included the Lee Energy Facility near Nachusa.



### Faulty sensors delay troubled Potsdam power plant

Faulty sensors are to blame for the latest delay to the village's troubled West Dam Hydro Plant project. The problematic sensors are responsible for measuring the speed of the turbine.



### Ohio energy-efficiency mandates costly, ineffective, says report

Ohio's energy-efficiency mandates have high costs and negligible benefits, according to a report issued this morning, sponsored by groups that would like to revise or eliminate the rules.



### ABB wins \$20 million order to strengthen Mozambique's power transmission grid

ABB, a global leader in power and automation technology, has won an order worth around \$20 million from Aarsleff - Seth JV to supply engineered equipment packages for two new substations that will extend the transmission network in Mozambique.



### O.C. nuclear cleanup firm triples in size with acquisition

A small nuclear-waste management company that helped clean up the Fukushima power plant in Japan will triple in size to more than 100 employees through an acquisition.

#### Related Products:

power power supply engine generator solar cell socket battery charger batteries power inverter lead acid battery ups charge controller connectors fuse contactor terminal blocks



#### About

About OFweek  
Contact Us  
Article Contribution  
Site Map

#### Buying on OFweek

Browse Categories  
Product Search by Keyword  
Browse by Country  
How to Buy

#### Selling on OFweek

How to Sell  
Premium Membership  
Display Products  
Manage Products

#### Information

News  
New Products  
Press Release  
 中文

#### Service

My OFweek  
Trade Alert  
Help Center