

Build a Better Bulb for a \$10 Million Prize

By ERIC A. TAUB and LEORA BROYDO VESTEL

The ubiquitous but highly inefficient 60-watt light bulb badly needs a makeover. And it could be worth millions in government prize money — and more in government contracts — to the first company that figures out how to do it.

Right now, that company could be Philips, the Dutch electronics giant. The company announced on Thursday that it had submitted the first entry for the L Prize, an Energy Department contest that will award up to \$10 million to the first person or group to create a new energy-sipping version of the most popular type of light bulb used in America.

As the first entrant, Philips will win the prize if its claims hold up. Testing of the Philips lamp will take close to a year to complete as the department independently evaluates the company's claims.

"Philips is confident that the product submitted meets or exceeds all of the criteria for the L Prize," Rudy Provoost, chief of Philips Lighting, said in a statement.

The \$10 million is almost beside the point. More important, the contest winner will receive consideration for potentially lucrative federal purchasing agreements, not to mention a head start at cracking a vast consumer marketplace.

The L Prize has garnered significant attention in the lighting industry because 60-watt incandescent lamps represent 50 percent of all the lighting in the United States, with 425 million sold each year. The Energy Department says that if all those lamps were LED equivalents, enough power would be saved to light 17.4 million American households and cut carbon emissions by 5.6 million metric tons annually.

For decades, incandescent light bulbs continued to bear a strong resemblance to Thomas Edison's creations, but new energy standards that go into effect in 2012 — and would effectively outlaw today's incandescent bulb — have brought about a period of fertile innovation in the lighting industry.

One of the first attempts at greater efficiency was the now-maligned compact fluorescent bulb, but there have also been efforts to modify incandescent technology to conform to the new standard. LED bulbs are now available in stores, but those models have limited output and high prices. A faithful reproduction of an incandescent bulb's light from an inexpensive and efficient source has been the industry's ultimate goal.

Philips has delivered 2,000 prototypes of its bulb to the Energy Department for testing. The company says the bulbs meet all the criteria of the contest, which specifies a bulb that reproduces the same amount and color of light made by a 60-watt incandescent bulb, but uses only 10 watts of power. The bulb must also last for more than 25,000 hours — about 25 times longer than a standard light bulb. In a nod to economic concerns, at least 75 percent of the bulb must be made or assembled in the United States.

If the new bulb passes the department's testing regimen, it will be an even more efficient, longer-lasting lighting

device than today's compact fluorescent bulbs. The department considers the introduction of compact fluorescents, today's alternative to standard bulbs, to have been a debacle.

At first, the department set no standards for compact fluorescent bulbs and inferior products flooded the market. Consumers rebelled against the bulbs' shortcomings: the light output from compact fluorescent bulbs was cold and unpleasant, their life was much shorter than claimed, many were large and undimmable, they would not work in cold environments and they contained polluting mercury.

By setting rigorous criteria for the L Prize, the department hopes LED bulbs can avoid a similar fate. That also means rejecting current LED bulbs that can claim some technical similarities, but fall far short of the L Prize's goals.

"We've probably eliminated almost 25 products that were horrible," said James R. Brodrick, manager of the Solid State Lighting Program of the Energy Department. "We test LED bulbs today that claim on the package that they're equivalent to 40 watts, but are really like 20-watt bulbs."

"This will be the most publicly tested bulb ever," Mr. Brodrick said.

The Philips LED lamp represents "a significant energy savings," said Nadarajah Narendran, the director of research at the Lighting Research Center at Rensselaer Polytechnic Institute. "This has now leapfrogged what C.F.L.'s can do."

The Energy Department will also award \$5 million to the creator of an LED reflector lamp (no entries have yet been made) and a new, "21st-century lamp," the specifications of which are yet to be defined.

General Electric — along with Philips and Osram Sylvania, one of the world's biggest lighting suppliers — said that it would introduce a new LED module next month that would make it easier to replace traditional light sources with LEDs. Osram had no comment about its plans.

The first certified products, due in about a year, will not be cheap. Today's LED-based bulbs cost up to \$100 each, and while there is plenty of optimistic talk about reducing that price, a clear path to affordability remains elusive.

To lower the cost, Mr. Brodrick has enlisted 27 utility companies around the country as L Prize partners, with the hope that utility subsidies, along with mass production, will help cut the cost. One such utility, Southern California Edison, will both test the bulbs and offer rebates to consumers, according to Gregg Ander, the company's chief architect.

"There's a potential for LED lamps to be much more acceptable to the consumer than compact fluorescents," Mr. Ander said. He said he expected that eventually, an LED substitute for a 60-watt bulb would cost the same as its compact fluorescent equivalent, factoring in its longer life.

Kevin Dowling, vice president for innovation at Philips Solid State Lighting Solutions, is confident that the LED light bulb can become an affordable option. "Over the long term, we can absolutely get the cost down to the \$20 to \$25 range," he said.