Gravity Bulb-The GRAVITY-powered lamp that could bring 1.5 billion people out of the darkness

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ABSTRACT:

The Gravia lamp is powered by the falling motion of weights, also known as gravity lamp. The Gravity Light uses a sand-filled sack to pull a rope through a tiny generator to power an LED light. Its makers claim a single pull can keep the light going for up to 30 minutes.

INTRODUCTION:

A person winds it up or flips it over, and the device has a renewed supply of potential energy with which to operate. Modern inventions like bicycle-powered blenders and kinetic battery chargers draw on energy stored in the human body, too.

Much like these designs, the gravity-powered lamp envisioned by **Clay Moulton**, a graduate student at **Virginia** Tech when his lamp won second place at the 2008 Greener Gadgets Design Competition, relies on people for power. In this case, the people don't wind a gear or pedal a bike; instead, they lift a series of weights back to their starting point. The Gravia lamp is powered by the falling motion of those weights, also known as gravity.

It's an interesting idea, using a (presumably) limitless resource like the pull of gravity to generate power. And while the Gravia lamp requires some advances in technology before it becomes a viable product, the concept is worth checking out. In this article, we'll get into the Gravia lamp and see what makes it glow, and we'll find out why a gravity-powered lamp may be an alternative-energy gadget to keep an eye out for.

The lamp is a standing floor lamp, 58 inches (147 centimeters) tall and cylinder-shaped. Inside the cylinder, there are several basic parts involved in creating light: brass weights, a ball screw, a drive gear, a rotor, generator and a bunch of LEDs. Here's how the process works:

WORKING:

The Gravia lamp relies on a much simpler concept: Gravity pulls objects downward. A person attaches five 10-pound (4.5-kilogram) brass weights to a ball screw near the top of the lamp. The platform immediately starts dropping along the screw, which is aligned along the length of the lamp. As the platform makes its way down the screw, the screw spins. This converts the downward motion of gravity (acting on the weights) into the rotationa motion needed to spin the gear near

the bottom of the lamp. The spinning gear in turn spins a generator -- a rotor/stator assembly that converts the rotational motion into electricity. The electricity powers 10 LED bulbs, which light up and illuminate the acrylic housing of the lamp.

All of this happens over the course of four hours, and the LEDs, which light up a few seconds after the weights start to drop, remain on for that full period. They emit between 600 and 800 lumens, which is comparable to a typical 40-watt bulb. When the weights make it to the bottom of the lamp, the LEDs go out, and the person who started the chain of events has to input more power by moving the weights back up to the top of the screw.

Benefits of Gravity Lamp:

Any way you look at it, gravity as an energy source is hard to beat. It's free, it's in endless supply, and you don't have to import it, mine it, refine it or grow it. The very force that keeps you rooted to the ground could end up powering your house some day.

Since the Gravia lamp wouldn't plug into an outlet at all, it's about as "green" a gadget as you're going to find -- except maybe a solar-powered cell-phone charger or wind-powered tent lighting. The device is entirely self-contained, relying solely on human input to trigger the cycle that creates light. There's no outside energy required beyond that which goes into producing the lamp components in the first place.

And those components, according to the inventor, will never need to be replaced -- or at least not in a human lifetime. He estimates the lamp will work for 200 years. LED technology, on the other hand, is not quite to the point of the 200-year bulb. You'd have to buy new LEDs as they burn out. The state of that technology, in fact, is the reason why you can't actually go buy this lamp for your home.

To generate enough power to light up those bulbs, the brass weights would have to weigh substantially more than a collective 50 pounds. They'd have to weigh about 2 tons (1.8 metric tons) -- a bit much for your typical human being to lift to the top of the lamp. LEDs will have to become significantly more efficient before the Gravia lamp becomes a real possibility.