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# FROM THE LABS

INFORMATION TECHNOLOGY

## Power Walking

KNEE BRACE COLLECTS ENERGY FROM ITS USER'S STRIDE

**SOURCE:** "BIOMECHANICAL ENERGY HARVESTING: GENERATING ELECTRICITY DURING WALKING WITH MINIMAL USER EFFORT"

Max Donelan et al.  
*Science* 319: 807-810

**Results:** Scientists at Simon Fraser University in British Columbia have designed a knee brace that can harvest

as much as 13 watts of power from the energy of its wearer's strides, enough to charge 30 phones simultaneously.

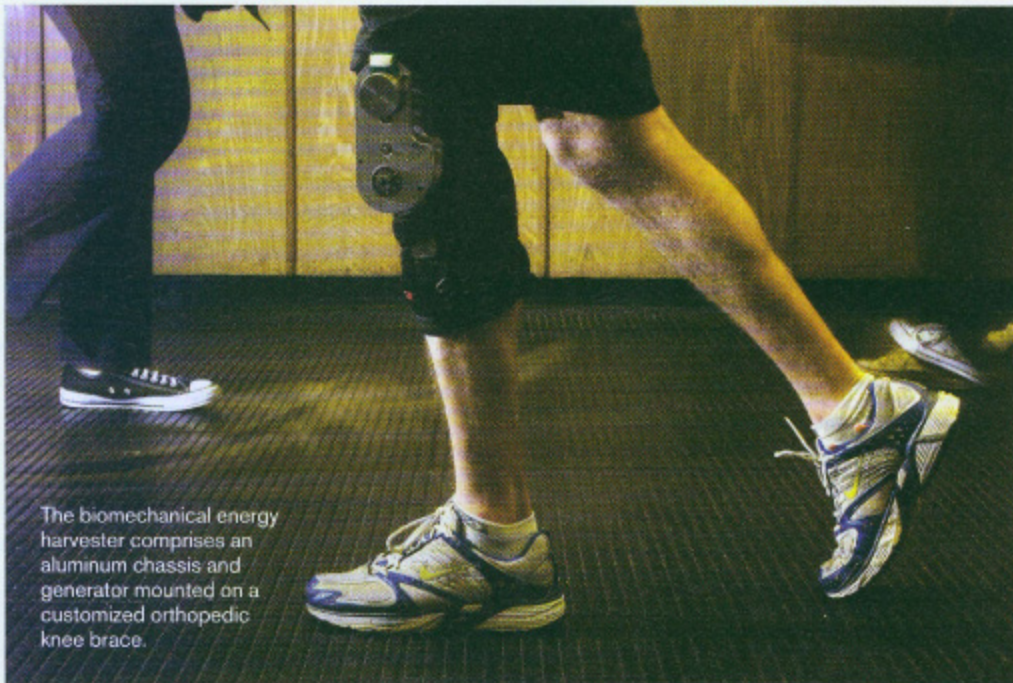
**Why it matters:** With the proliferation of small gadgets that need to be charged, engineers are looking for alternatives to electrical outlets for charging. Researchers had already made shoe-embedded generators that are easy to use, but they don't collect more than a watt of power, making them impractical.

**Methods:** The researchers looked at the biomechanics of

the human gait and saw that at the end of a stride, a person must actually exert energy to slow his or her moving leg. When the brace's generator is engaged, it helps slow the leg for the wearer, capturing energy in much the same way that a hybrid car harvests power from braking.

Rather than forcing the wearer to work harder to produce extra energy, the brace reduces the effort exerted at the end of a stride. A sensor in the device monitors the angle of the knee to turn the generator on and off so that it doesn't impede motion in the early part of a stride, when the knee is accelerating.

**Next steps:** The prototype device weighs just over three pounds; a spinoff company, Bionic Power, is developing a lightweight model.



The biomechanical energy harvester comprises an aluminum chassis and generator mounted on a customized orthopedic knee brace.