

# **Team with watch that runs on body heat turns to crowdfunding site**

November 15 2016, by Nancy Owano

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(Tech Xplore)—The makers of something titled the Matrix PowerWatch have a painful reminder for those of us who live our daily digital lives. Oh boy, imagining the scene hurts. Consider the vast numbers of batteries thrown away and ending up in landfills every year. Our environment, not our household budgets, bears the real brunt of damages.

A recent video shows Akram Boukai, who is CEO, Matrix Industries and Caltech PhD. He and team are behind the watch. In a video, he talks about the technology they developed to address the issue of energy.

They have pursued technology to make energy more efficient. Where did they turn? To a problem everyone experiences firsthand. Frustration when your electronic device runs out of power when you need it the most.

"After five years and several prototypes," he said, "we are introducing our first product."

That product is a watch. And it is powered by you. Your body heat is converted to [electric power](#). You never have to charge it. The watch comes alive because it is powered by you. What a way to harness the world's wasted heat

They said they also built micro applications to do more than just tell the time.

You can do some exciting things with this technology, said CTO Douglas Tham in the video, such as measure the amount of calories you burn. Also, the watch has sensors to track activity and sleep quality.

The makers provide a features list. The watch is water resistant to 50 meters, has changeable watch faces and an automatic time zone

adjustment. As for the apps, you can check how much electric power you've produced during the day, weekly trends, all-time records, and, according to the team, will support Apple HealthKit and Google Fit.

As you exercise your skin gets warmer, and the watch generates more power. It has a power meter. The meter shows how much electricity your body has generated.

What happens if you remove the watch? It goes to sleep as does all your data. "PowerWatch goes to sleep and runs off battery power where it draws a tiny amount of current. Put it back on and it turns on with the correct time," said the campaign page.

They said they now have a few dozen prototypes and a ton of data and are aiming to swing it into production, and have turned to Indiegogo for taking pre-orders.

"Join our campaign," said Boukai, so that they can get this watch into your hands. Funds will go to final production tooling to manufacture the watch.

The team discussed funding on the Indiegogo page and stage they reached now. "We have already completed the design for manufacturing and all that remains is the production runs necessary to get the watch into your hands. To reduce risk, we are working with a Hong Kong-based [product development](#) and manufacturing partner who has an excellent track record shipping millions of units of products, including some of the most successful wearable products on the market."

The asking price? It is \$99, their special first-bird price, and estimated delivery is July. The next discount offer is \$139 with estimated delivery in September.



Fundamental to what makes the watch function is the team's use of thermoelectric technology, applied toward a consumer product. The Matrix team includes experts in thermoelectric material science, thermal

engineering, and consumer product development and manufacturing. The core team consist of PhD graduates from Caltech, MIT, Harvard, and UCSD.

"It is based on the Seebeck effect discovered in 1821. In the absence of an applied voltage gradient  $V$ , electric current,  $J$ , can still be generated if there is a temperature gradient,  $T$ : A thermoelectric material must have a low thermal conductivity and high electrical conductivity to function efficiently. NASA has used this technology to power the Voyager spacecraft and Curiosity, the mars rover."

Tekla Perry in *IEEE Spectrum* quoted a Matrix team member on how the company may move forward beyond the [watch](#).

"We see ourselves as a thermal energy harvesting company," Anne Ruminski, Matrix senior [engineer](#)," said, according to Perry. "We would like to see the technology be applied to other wearables, medical devices, and smart sensors."



**More information:** [www.indiegogo.com/projects/sma ... atch-watch-fitness#/](http://www.indiegogo.com/projects/sma...atch-watch-fitness#/)

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