

## **For Immediate Release**

December 10<sup>th</sup>, 2013

### **SAFCell to Generate Power for Caltech Solar Toilet**

The California Institute of Technology (Caltech) will incorporate a fuel cell stack made by SAFCell, Inc. (Pasadena, CA) into its award-winning solar toilet to enhance the lavatory's energy-efficiency.

The solar-powered prototype toilet, winner of the Reinventing the Toilet Challenge issued by the Bill and Melinda Gates Foundation in August of 2012, uses a chlorine reactor to rapidly disinfect wastewater. The hydrogen resulting from that solar driven electrochemical reaction will be diverted to a fuel cell, which will generate additional electricity for powering the lavatory at night or as needed for other lavatory components.

"Along with hydrogen, our chlorine reactor produces other by-products, or fuel impurities, which is why we chose the impurity tolerant SAFCell stack over other technologies," said Dr. Michael Hoffmann, the James Irvine Professor of Environmental Science at Caltech and lead researcher on the solar toilet project.

All fuel cells have at their core an electrolyte layer that converts hydrogen into electricity, but pure hydrogen is not always available or practical. SAFCell's patented solid acid electrolyte has unique properties that translate into high tolerances to fuel impurities that would poison other fuel cell technologies. This equates to the ability to operate on even very dirty fuel gases, like those generated by the solar toilet.

"Incorporating a SAFCell fuel cell into our prototype will make our toilet even more self-sustaining, which is essential for meeting not only the challenge from the Gates Foundation, but moreover, the challenges of the real world," said Dr. Hoffmann.

"We are very proud to work with Dr. Hoffman and Caltech on this project, and that our fuel-flexible technology can be applied to such a noble cause" said SAFCell CEO Dr. Calum Chisholm.

According to the World Health Organization, 2.5 billion people around the globe are without access to sanitary toilets, which results in the spread of deadly diseases. The Reinventing the Toilet Challenge is part of a \$40 million program initiated by the Gates Foundation to tackle this problem. In 2011 Professor Hoffmann and his team were awarded a grant to create a toilet that can safely dispose of human waste for just five cents per user per day. The lavatory cannot use a septic system or an outside water source, or produce pollutants.

SAFCCell, Inc. develops scalable solid acid fuel cell stacks for applications requiring tens of watts to tens of kilowatts. Operating at mid-range temperatures around 250°C, SAFCCell's stacks are built around a simple and rugged design, and can operate easily on commercially available fuels (e.g., propane, natural gas, or diesel), resulting in very durable power systems for portable and stationary applications.

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