

Innovation making waves pulling water from air

April 25 2016



Professor Majid Bahrami of Simon Fraser University's School of Mechatronics Systems Engineering is developing a sustainable solution to the global water shortage by more efficiently generating drinkable water from the atmosphere. Credit: Marianne Meadahl/SFU University Communications

Researchers in Simon Fraser University's School of Mechatronics Systems Engineering are tackling the world's water crisis by pulling water out of the air.

Professor Majid Bahrami, the recipient of a 2016 Canada Clean50 Award, has spent the past three years working with his PhD student, Farshid Bagheri, to find a sustainable answer to the world's growing [water](#) needs.

Their result is the patent-pending Hybrid Atmospheric Water Generator (HAWgen), which generates [clean drinking water](#) from the atmosphere through the integration of sorption, refrigeration and water filtration systems.

The system provides water generation even in hot and dry conditions and uses both waste heat and renewable energy sources.

Developed in Bahrami's Laboratory for Alternative Energy Conservation at SFU's Surrey campus, the atmospheric water generation [technology](#) will be marketed through their company, WATERGENICS Inc.

The company was recently shortlisted for a BC Technology Industry Association (BCTIA) 2016 Technology Impact Award in the most-promising pre-commercial technology category. Winners will be announced on June 7.

The company is cited for "being positioned to introduce the next generation of atmospheric water generation technology, and products in both custom-engineered systems and proprietary standard off-the-shelf solutions."

The HAWgen is the latest venture for Bahrami, whose research focuses on improving the efficiency of heating and cooling systems for use in

vehicles, electronics and buildings. He plans to target the product for applications in various resource industries, such as mining, oil and gas and even disaster relief, as well as consumer use, by the end of 2017.

"Our vision is for this technology to not only make a difference as we face the ongoing issue of global water shortage, but to do so sustainably for future generations," says Bahrami.

The technology will also play a role in the City of Surrey's newly unveiled BioPod Initiative, a regional hub for agri-tech innovation, where researchers can test high tech solutions to improve the efficiency of year round food production. The HAWgen will be central to providing a sustainable source of water for plant growth in the facility.

"Majid has earned more than \$10 million from funding agencies for his alternative energy research," said Uwe Glässer, dean of SFU's Faculty of Applied Sciences. "He is creative and clearly a leader in this important area. As a faculty member, he has provided an opportunity for many undergraduate and graduate students to challenge themselves and push the boundaries of their knowledge in sustainable energy."

Fast Facts:

- The HAWgen system is environmentally friendly. Bahrami says the water is sustainable because whatever is extracted from the atmosphere's nearly 13 trillion cubic meters of renewable fresh water is replenished naturally, thanks to ocean evaporation.
- The HAWgen is able to generate water in nearly all climates, unlike more conventional atmospheric water generators—those rely on hot and humid environments and can fail when humidity drops. The HAWgen can handle dry climates and can be powered by sustainable energy sources.
- It works by pre-conditioning the incoming air stream using an

adsorption system, then channeling it into a refrigeration unit for condensation. The generated water is then filtered.

- The researchers' pre-market prototype can generate up to five times the amount of water per day than conventional atmospheric water generation systems.

Provided by Simon Fraser University

Citation: Innovation making waves pulling water from air (2016, April 25) retrieved 26 April 2024 from <https://phys.org/news/2016-04-air.html>

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