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FUELING AROUND

A DESIRE TO HELP OTHERS IS THE POWER BEHIND THIS YOUNG INVENTOR'S SUCCESS.

By Tim Lougheed

Some parents have to deal with teenagers who stay out late or play the stereo too loud. Not Asha Suppiah's parents. They have to stop their daughter from bringing fuel tanks of hydrogen into the house.

Actually, what Asha really wanted to do was experiment with **[1] fuel cells**. But like everyone else investigating this promising technology, she had to deal with the challenges of the fuel source. Hydrogen is a troublesome and volatile substance—highly explosive, hard to store, and even harder to find.

That's why Asha designed a system that produces hydrogen in small, manageable amounts, as part of a two-step process. The process begins with a solar power array that uses electrolysis to extract hydrogen from water, then uses that hydrogen to run the fuel cell. And to improve fuel-cell efficiency, she also developed special electrode coatings to enhance the output of the fuel cell. "It's a very interesting way to do it," she says. "And it's very effective, as well as environmentally friendly."

Asha's work earned her a senior gold medal at last year's Youth Science Foundation (YSF) Canada Wide Science Fair in St. John's, Newfoundland and Labrador. But it wasn't her first distinction at such a competition. Asha, now 18 and on the verge of graduating from Mackenzie High School in Deep River, Ontario, has been winning medals and special awards in science fairs since she was in Grade Six.

"I get really passionate about something when I've found that it's going to make an impact on the world," she says. "You know how when people play in a big tournament they get an adrenalin rush? That's what I get when I present my projects."

In fact, the first of those projects had a highly personal incentive. While visiting family in India, she encountered an ongoing shortage of fresh water. In a moment of irony, she was struck by the abundance of water in the nearby ocean. After some investigation, she subsequently learned about the high cost of desalination—removing salt from water—and understood why efforts to convert salt water to fresh drinking water had been stymied. And so she began thinking about the abundance of sunlight in the sky.

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"Why not use these two things we have so freely to produce fresh water?" she asks. That's when she examined how solar power could be applied to desalination. She eventually refined the technique and discovered that by soaking woven cotton with salt water and heating it, she had conducted her own crude form of desalination. This initial idea won her a silver medal at her first YSF Canada Wide Science Fair in London in 2000. Further developments won her a gold medal the following year in Kingston, and she has even applied for a patent for the concept.

Asha is eager to show people the full range of technological possibilities for improving their lives. Her pursuits and activities in the world of science and innovation have enriched her own life. Among the highlights, she has participated in activities such as the Deep River Science Academy, a distinguished summer science camp that brings together outstanding high school students from across Canada to spend six weeks engaged in work at some of the country's leading research facilities.

Such experience has shaped Asha's outlook as she prepares to attend university next year. At this point, her interests revolve around the medical sciences, although she's not sure if she would prefer helping patients one at a time, or perhaps usher in a technical innovation that could come to the aid of entire populations at a time.

Regardless of the specific direction her career might take, her higher calling will undoubtedly carry her through.

[1] Fuel cells

An electrochemical device that can continuously convert the chemical energy of a fuel (e.g. hydrogen) and an oxidant to electrical energy. The fuel and oxidant are typically stored outside of the cell and transferred into the cell as the reactants are consumed. Hydrogen (H2) is needed in a fuel cell to produce power from its combination with oxygen and the conversion of the chemical energy generated by the production of water to electrical energy via an electrochemical process. Although it would be ideal to use hydrogen directly, it cannot be found as such in the environment and must be extracted from other fuel sources such as water, natural gas, methanol, petroleum products, and other fuels.