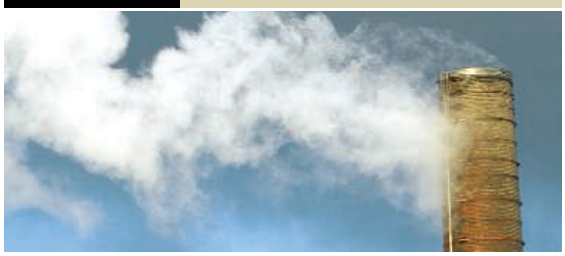
From Greener Production to Carbon Trading: Sustainable Energy Careers

Field >> Environmental Conservation



WEST JERUSALEM, ISRAEL—The corporate world has been slow to recognize the threat of climate change, says Noam Gressel, CEO of Assif Strategies, an Israeli environmental consulting firm. But the prospect of global warming, together with the recent jolt in fuel costs, is bringing industry round to the idea that "we cannot continue current levels of dependence on fossil fuels." As companies have become more environmentally aware, Gressel says, job opportunities have "mushroomed" in a field that was "for many years on the wayside of academic research and business": strategic environmental management. The aim of the new discipline, Gressel says, is to guide companies to environmentally sustainable practices—from reducing pollution to switching to renewable energies. And that, in a nutshell, is Elisheva White's career objective.

The 32-year-old American-Israeli engineer joined Assif last year after a 10-year stint in U.S. industry that increasingly focused on environmental issues. Her long-term goal, she says, is to make "the biggest difference I can by changing people's awareness of the environment."

From Detroit to the Holy Land

White admits with a smile that she's wearing hemp trousers and an organic cotton shirt. Still, for most of her life, "I didn't consider myself an environmentalist at all," she says. From age 12, she was dead set on becoming a biomedical engineer. After suffering chronic knee pain while growing up on the outskirts of Detroit, Michigan, "I decided that I had to build myself a new pair of knees." That secret plan, along with her gifts in science and mathematics, propelled her into an undergraduate engineering program at the University of Michigan, Ann Arbor. Her plans hit a roadblock when she realized that "I could never bring myself to experiment on animals." The switch to mechanical engineering was inspired by her involvement with the university's solar race-car team—her team's car won the U.S. Sunrayce championship in 1993. "I just liked the challenge of it," she says, but it proved to be the perfect start for a career linking engineering and environmental issues.

After earning her B.S. magna cum laude in 1997, White worked for 10 years on semiconductor testing equipment at Hewlett-Packard in Colorado. Within months, she started tinkering with ways to make the company's operations more sustainable environmentally. Her motivation "stemmed from idealism," she says, but her reasoning was based on business principles. Some of her ideas were simple, such as allowing employees to take old cardboard boxes home for personal use, saving the company the expense of processing them as waste. Others were more complex, such as borrowing concepts from biological circulatory systems to make the layout of pipes and wires in a semiconductor assembly room more energy-efficient. Eventually, the proportion of White's time devoted to environmental sustainability increased from 10% to 50%. She persuaded the management of the facility—which became the spinoff Agilent Technologies in 1999—to require all its hardware engineers to take a standard course in environmental design. She also ran its product-stewardship program for 3 years, studying the life cycle of products and finding ways to reduce their environmental impact. It turned out to be easy to get the management behind her on environmental issues. "I just had to ask," she says.

The environmental aspects of her work proved to be the most satisfying, so White decided last year that it was time to move further in that direction. In order to be able to "interact on a higher level" in the business world, she decided to join a part-time MBA program run jointly between Northwestern University in Evanston, Illinois, and Tel Aviv University here in Israel. "I had visited Israel when I was 15 and fell in love with the place and the people. When I saw this option, I jumped on it."

The program, which she expects to finish in 2008, allows plenty of time for work. Assif scooped her up within 3 months of her arrival in Jerusalem. "She is one of those few who have a strong technical background alongside strategic environmental management experience in a large international company," says Gressel. "Her enthusiasm for the subject and forthcoming personality could not be ignored."

Closing carbon loops

Assif works with industry to help make the same sort of environmental improvements that White tested at Agilent. But currently one of the company's main activities is helping Israel implement greenhouse-gas trading under the Kyoto Protocol, and this has become White's focus. Part of her job is talking with Israelis in industry about their energy needs and understanding how the culture shapes energy consumption. "There's this culture of security here that says, 'We're just trying to survive today,' " says White, "and that makes people discount the environment. It's a real obstacle."

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CREDITS (TOP TO BOTTOM): EFRAT CAMPAGNANO; PHOTOS.COM

Her main task is to identify potential carbon-trading projects. One of the areas she's researching—pig farming—seems like a strange choice until she explains that the largest Israeli pig farm produces an estimated 1000 tons of methane—a greenhouse gas 21 times more potent than CO_2—every year. If all those pig feces were collected in lined ponds to let anaerobic bacteria thrive, they could become a renewable source of 1600 tons of biogas, which can be used to generate heat and electricity on site while simultaneously reducing Israel's greenhouse-gas emissions. Another area White is likely to engage in is wind farming. Israel has powerful gusts in the southern deserts and the northern highlands that could be tapped for power generation.

The aim is to help the Israeli Environmental Ministry register a project with the U.N. Framework Convention on Climate Change board that would allow Israel's greenhouse-gas reductions to be traded with developed countries that need credits to meet their emission caps. Israel counts as a developing country for the purposes of the Kyoto Protocol, which came into effect in 2005. That qualifies it for the clean-development mechanism (CDM) specified by the protocol. "If an alternative-energy project is too expensive for a country, funding through CDM covers the difference," says White, who would continue to be involved with a project's implementation.

In the years to come, "sustainability will increasingly become part of the corporate fabric," predicts Joel Makower, executive editor of Greenbiz.com, one of the leading advertising Web sites for jobs related to environmental sustainability in business. As it does, opportunities for people with White's industrial background and ambitions should increase. White is just settling in, but already she feels secure in a career related to climate change. "I'd love to be out of a job because the problem is solved. But unfortunately, I don't see that happening in my lifetime."

–JOHN BOHANNON

Covering the Planet With Solar Panels

Commuting 2 hours and burning 4 gallons of gas every day can make a Silicon Valley scientist seriously consider his carbon emissions. In 2005, Steffen Jensen, now 36, left Silicon Valley behind to take a new job closer to his Santa Cruz, California, home. But when an opportunity arose last year to join Palo Alto, California–based solar start-up SolFocus, he was forced to reconsider. The new job meant another long commute, but it also meant an opportunity to make a real difference in the sustainable-energy field—far more than he could ever achieve by pedaling.

Founded in November 2005, SolFocus is working to make solar energy cheaper by using thin-film materials that are more expensive—but also more efficient—than silicon. The key to making the company's triple-junction solar cells affordable is concentrator technology, which focuses sunlight on a small area so that a little of the expensive thin-film solar material goes a long way. Since joining SolFocus, Jensen has been working on the transition from the company's current model system to full-scale production.

Jensen, who received his Ph.D. in physics from the California Institute of Technology (Caltech) in 2000, is catching up on materials science and other areas in which he has no formal training. He and his team are currently working to improve the optics of their system, which focuses a two-mirrored, cassegrain-type telescope on a highly efficient solar cell. "Today, I focus on getting the photons that come from the sun in the right spot," he says. As the company's needs change, he expects to follow the energy, working more on getting the electricity produced by those photons onto the power grid. "I'm probably going to evolve as I move along the path of that photon."

Early on, Jensen thought he'd follow in his father's footsteps and become an engineer. He enrolled at California Polytechnic State University, but soon he realized that he preferred the broader, deeper curriculum physics offered to the more applied engineering course. He got his degree and then pursued a Ph.D. in high-energy physics at Caltech, where he helped build an optical pumping system for a target used at an electron accelerator at the Thomas Jefferson National Accelerator Facility in Virginia. But by the time he was done with his doctoral work, high-energy physics was starting to feel a little too confining.

He considered working on medical applications of high-energy physics, but he soon realized that the path to real-world applications was too long. Seeking a faster pace, he followed the dot-com boom to Silicon Valley in 2000, not long before the crash. He joined the telecommunications company SDL, where he worked for a year developing optical amplifiers.

Jensen's physics had taught him how to approach and analyze technical problems, but his work in industry taught him a new set of skills. "There's a whole level of relationships that you have to learn how to develop [in industry]: There's people that you buy and sell things from … [and] people in different kinds of disciplines," he says. Jensen brings to the table the ability to recognize and understand problems on a fundamental level, says Jim Sulhoff, his former supervisor at optical-networking company Onetta, where Jensen worked from 2001 to 2005. Sulhoff is now director of engineering at the Naperville, Illinois, office of Scientific-Atlanta, a Cisco company.

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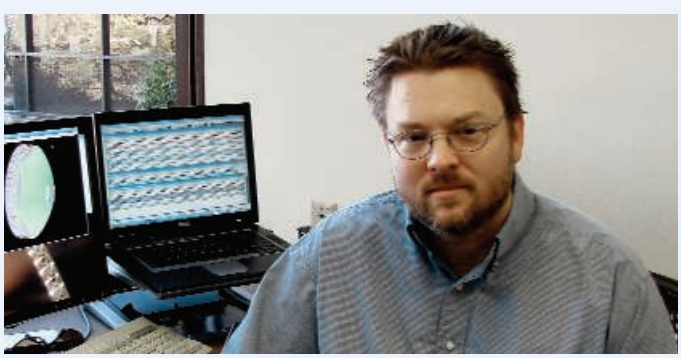

Field >> Solar Energy

Working on solar energy means rising before dawn to catch every ray possible, and working for a start-up takes him well into the evening on most days. But despite the long hours and the long commute, Jensen is confident that he has found his niche. He regrets giving up his bicycle, but he knows it was worth it. "When the SolFocus opportunity came up, it was just so compelling, it was worth the trade-off to go try to cover the world with solar panels—worth burning 4 gallons of gas again per day."

–SARAH WEBB

Sarah Webb is a writer in Brooklyn, New York.

CREDITS: SOLFOCUS INC.