

Burke, standing above the East Bay near Oakland, Calif., believes his nano-silicon crystals will light up the future



CONRAD BURKE
INNOVALIGHT
SANTA CLARA, CALIF.

Let There Be Nano

EINSTEIN EXPLAINED IT A CENTURY AGO AND won a Nobel Prize. Now we make use of it every day—inefficiently. It's called the photoelectric effect: light can produce electricity. Electricity produces light. But solar energy still costs more than the fossil-fuel variety. And our lightbulbs and fluorescent tubes waste half their energy.

InnovaLight Inc. wants to help. The company's process for reducing silicon to nanosize, light-sensitive crystal dots could revolutionize solar energy and lighting. The start-up, which just moved to Santa Clara from St. Paul, Minn., claims it will be the first to market with a silicon nanoparticle solvent—"ink"—that would mean lower-cost printing of silicon nanoparticles on polymer sheets. That, in turn, would

mean lower-cost solar energy because nanosize silicon is a more efficient converter of solar energy to electricity than previously used materials. It could also mean a nanoparticle light "bulb" that would outlive you. What's more, silicon (as in sand) is abundant and harmless. "It's brand-new technology," says InnovaLight ceo Conrad Burke, 39. "We're in a leading position. We're going to do something that has an impact on people's lives."

Any lighting technology on a silicon platform could "drive volume economics and mass market," says Mario Paniccia, director of Intel Corp.'s photonics technology lab. Researchers in business and academia are scrambling to create such flexible solar cells because existing solid silicon solar panels are heavy and unwieldy. Flexible, or conformal, solar cells could wrap around surfaces and pack easily for transport. A solar-cell liquid could even be painted on.

InnovaLight is exploiting the work of Brian Korgel at the University of Texas in Austin, a board member, to create nanoparticles of uniform size. The firm already tunes its fluid-stored silicon nanoparticle mix to capture everything from infrared to

ultraviolet and the visible spectrum in between. Conversely, it can infuse the fluid into thin, flexible panels that emit a controlled range of light—2-nanometer particles for blue, 10 nanometers for orange. Blending particle sizes produces white light.

InnovaLight ceo Burke, whose roots are in sales, marketing and physics, was a fast riser at AT&T and its Lucent spin-off. In 2000 he joined an optics firm called OMM Inc. that tanked with the telecom sector in 2003. Stints with a venture-capital firm and optical-component maker Bookham Inc. followed. Burke's former boss Phil Chapman, now cfo with Peregrine Semiconductor Corp. in San Diego, calls him "fearless." Fearlessness will serve Burke well now. "You don't want to be partnering with a customer who expects this to be simple," says another of Burke's former bosses, John Hughes.

Burke wants product samples ready in a year and a product launch in two years. Should he succeed, the result could be revolutionary. Don't think about longer-lasting lightbulbs; think about the price of oil coming down \$20 a barrel. It won't be easy, but what breakthrough is? —By Marc Hequet/
St. Paul