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TECHNOLOGYREPORT By Tom Schuler, President and CEO, Solidia Technologies®.

Driving Sustainable Innovation to Market: It can't just be green, it has to be better

Attracting investors for green technology is not easy. Persuading industries to change is even harder. Trying to do both as a start-up can be daunting.

Solidia Technologies® is a cement and concrete technology company. We are bringing sustainable innovation to a market that is 2000 years old. The last time this industry embraced a major product innovation was about 200 years ago with the invention of Portland cement. To say we are targeting an industry resistant to change is an understatement.

Our job at Solidia isn't only to develop sustainable technologies; it's to make it possible for industry to adopt them. To drive innovation to market you need the right people, a compelling vision, collaborators who give you market insight and credibility, and enough time. To remain competitive, the business itself must be sustainable.

The start-up must prove the technology is commercially viable. Make it a good business, then make it green. Target the largest market possible and demonstrate broad applications within it. Focusing too much attention on exit opportunities diverts energy from increasing the value of the company. Focus on the input, and the output will come.

Concrete is the most widely used material in the world after water. Cement is used to bind concrete together, giving it the strength needed to have the durability required for a wide variety of applications around the world. Cement production, however, is the second largest emitter of carbon dioxide (CO₂) in the world. The industry knows this is a challenge they must address, and they have set goals to dramatically reduce their carbon footprint.

Changing the industry requires a change with minimum cost, maximum impact, and added value. Ordinary Portland cement (OPC) uses water to cure and releases about 800kg of CO₂ for each ton produced. It also takes 28 days to reach maximum strength. By contrast, Solidia Cement™ recycles 60 to 100 percent of water used and cures with CO₂, reducing carbon emissions by up to 70 percent. CO₂-cured Solidia Concrete™ is also more durable, costs less to produce than traditional concrete applications, and can reach maximum strength in less than 24 hours. It can be adapted to any concrete formulation, production method and product specification.

Targeting the estimated US \$1 trillion concrete and US \$300 billion cement markets, Solidia has overcome two of the biggest obstacles to disruptive innovation: ease of implementation and cost of adoption. Our technology addresses an urgent, global business

and societal need while profitably supporting an industry seeking to improve production methods. The Cement Sustainability Initiative of the World Business Council for Sustainable Development set 2050 CO₂ reduction targets for the global cement industry. If the industry were to adopt Solidia's technologies today, it would achieve those 2050 goals in three years.

Collaboration is key. I have had the unique perspective of experiencing this from two distinct vantage points: from the giant global leader (I led global businesses for DuPont in building materials) and now at a start-up. These players have a symbiotic relationship: Start-ups often manage risk better than large industry players, while established sector leaders provide real-world, practical market intelligence, research and development (R&D) support, and access.

Solidia's R&D collaborators, who come from industry, government, and academia, include Lafarge, a world leader in building materials, on research in concrete applications, The Linde Group, a global leader in the international gases market, on CO₂ supply and delivery, and CDS Group, the world's leading curing and drying specialists, on the design and manufacture of curing chambers to accommodate the CO₂-curing process. The U.S. Federal Highway Administration supports Solidia with a Cooperative Research and Development Agreement (CRADA) to examine transportation infrastructure applications, and the National Energy Technology Laboratory has co-funded a four-year R&D project as part of its CO₂ Storage Program. Ongoing testing continues in laboratories at Rutgers University, where the original generation of the technology was developed, as well as Purdue University, Ohio University and the University of South Florida.

We have also attracted investors, including Bill Joy, Kleiner Perkins Caufield & Byers (KPCB), Bright Capital, BASF, BP, LaFarge, and Total Energy Ventures, who have elevated sustainability to a core purpose and value social impact as well as profits.

At Solidia we have taken a complex technology and made it simple and applicable anywhere in the world. Combined with an innate



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sense of urgency, our team quickly combines market insight from our market and technology partners with leading-edge technology to produce a credible solution to a problem that the industry has long sought to fix. This collaborative approach, along with a focused effort to target individual markets that need a better solution, is resulting in unusually rapid acceptance from an industry that values performance. The fact that it is sustainable is readily embraced, but it has to work first. It can't just be green, it has to be better. □

