



Spotlight:

Biomimicry

Energy-Related Solutions Inspired by Nature



Biomimicry – the study of nature for inspiration for man-made products – is maturing from a design movement into a growth industry with new products based on beehives, whales, and seashells¹. Globally, by 2030, Biomimicry could generate \$1.6 trillion of Gross Domestic Product.²

New York has launched the **first state-sponsored** biomimetic industrial-design program based on the potential for a related startup cluster, which would attract significant interest from industry, and among researchers.





KEY PROGRAMS, PARTNERSHIPS AND RESOURCES

- The New York State Energy Research and Development Authority (NYSERDA) has retained biomimicry experts to coach a defined group of N.Y.-based companies to jump-start biomimetic industrial designs, and is supporting a two-year program that allows New York State manufacturers to apply to participate in free workshops and consulting on biomimicry.
- Terrapin Bright Green, a leading environmental consultancy, and Biomimicry 3.8 (formerly The Biomimicry Guild), which specializes in bringing biologists into industrial design processes, are spearheading a biomimicry program for NYSERDA. With outreach partners throughout New York State, the project team will identify pressing energy-related challenges, and will use workshops to identify individual consulting opportunities to guide companies toward innovative biomimetic solutions.
- Mid-term strategies with Terrapin Bright Green include coordinating interactive meetings between grantees of NYSERDA support and biomimicry experts, raising biomimicry awareness, and providing targeted support for product deployment.

FEATURED STATS

- Sales of biomimicry-based products and architectural projects have generated over \$1.5 billion in revenues in the span from 2005-2008. Source: *Washington Post* www.washingtonpost.com/wp-dyn/content/article/2008/12/28/AR2008122801436.html
- By 2030, the emerging field of biomimicry could represent \$425 billion annually of U.S. gross domestic product (GDP) in 2013 dollars, and add another \$65 billion to GDP by mitigating the depletion of natural resources and reducing CO₂ pollution. Source: Fermanian Business Institute, www.pointloma.edu/sites/default/files/filemanager/Fermanian_Business_Economic_Institute/Economic_Reports/BioReport13.FINAL.sm.pdf

INNOVATION IN ACTION

- Ecovative (www.ecovatedesign.com), in Green Island, NY, is a material science company that adapts living systems to create environmentally responsible materials and products. The Company is developing a new class of home-compostable bioplastics based on mycelium, a living organism. Mushroom Materials are high-performance, environmentally responsible alternatives to traditional plastic foam packaging, insulation, and other synthetic materials. "Nature provides the most inspiring, extensive, and functional set of molecular machines imaginable. From grass that converts photons to fibers, to cuttle fish displaying

shifting patterns on their backs, the most impressive technology is not found in our labs, factories, or companies, but in our woods, oceans, and fields." -Eben Bayer, Ecovative CEO. www.ecovatedesign.com/news/index.cfm?guid=544F74015E72C82DE7AB17F112ECB14113F107DE51D5BC5A10A9073D94CCD5A96F61F068EF909C178F18C0188BBAF66E

- Biomimetic Efforts in New York:
 - Panelite (www.panelite.us) designs wall panels based on the honeycomb's ability to manage heat from sunlight. The honeycombed glass glaze was installed in the new JetBlue terminal at JFK International Airport to minimize solar heat gain in the large glazed spaces and reduce terminal HVAC costs (being among the highest ongoing operating costs for airlines). Source: www.panelite.us/projects/case-studies/jet-blue-terminal-t5-jfk-airport/
 - More than 30 related academic research efforts are underway in New York. Success stories include Cornell, which is ranked in the top 10 best "cleantech" universities in the country and has become a natural spawning ground for cleantech. Novomer, which makes plastics and resins by using CO₂ like a plant, is an example of a clean technology business that incubated and developed at Cornell.
 - Based in Brooklyn, sustainable design startup SMIT (Sustainably Minded Interactive Technology) is taking orders for the first commercially available version of Solar Ivy, a solar energy product that looks and behaves like natural ivy on buildings. In June 2011, co-founder Samuel Cochran presented SMIT and Solar Ivy to the chairperson of the White House Council on Environmental Quality.

LEARN MORE

- New York State Energy Research and Development Authority (NYSERDA) www.nyserdan.gov
- New York Biomimicry Innovators Group www.ny-big.org
- Terrapin Bright Green Biomimicry Technical Assistance www.terrapinbrightgreen.com
- Biomimicry 3.8 www.biomimicry.net
- Solar One and NYC ACRE (Biomimicry in the Big City) www.greentechmedia.com/articles/read/biomimicry-in-the-big-city
- Ask Nature (a project of the Biomimicry Institute) www.asknature.org

¹ AskNature.org

² Fermanian Business Institute

About NYSERDA

NYSERDA offers objective information and analysis, innovative programs, technical expertise, and support to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce reliance on fossil fuels. NYSERDA professionals work to protect the environment and create clean energy jobs. A public benefit corporation, NYSERDA has been advancing innovative energy solutions since 1975.

