PARE GreenTimes

July 2011
ISSUE 21

Green Lingo: Organic Farming

Farmers and gardeners plan to grow their crops without the aid of artificial fertilizers and harmful chemical pesticides. Organic ranchers and dairymen raise their livestock free of drugs and animal hormones.

The definition of organic varies from place to place but may include things such as a minimum time period that a field is free of chemical use before being used for organic farming. Organic farming and organic food production have some other basic rules:

- no use of chemical fertilizers or synthetic drugs
- no use of genetically modified organisms
- prevention from soil loss and erosion
- promotion of 'bio diversity' – support a range of crops

For more information go to: http://www.living-organic.net/organic-farming.html

Organic Foods

Green Product of the Month: Carbon Negative Cement

Production of cement, a component of concrete, is anticipated to double by 2030. Creating cement however is among the most polluting and energy-consuming industrial processes; for every ton of cement produced, nearly one ton of carbon dioxide is released. Because of this, a new process for producing cement is being studied by Stanford University whereby producing the cement actually captures carbon dioxide rather than releasing it into the air. The Calera Process sends carbon dioxide emitted from existing power plants through seawater, effectively converting it into carbonate minerals, which can be used to manufacture cement replacement materials or aggregates.

Information taken from, National Design Triennial – Why Design Now? Smithsonian, Cooper-Hewitt National Design Museum.

Green at PARE: Massachusetts Model School Program

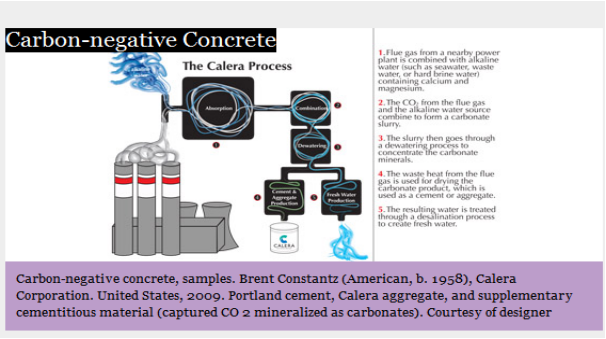
The Massachusetts School Building Authority's Model School Program uses design elements from recently constructed schools to make design and construction of new schools more efficient and less costly. Each of the schools constructed under this program incorporate sustainable design elements, and many achieve LEED certification through the United States Green Building Council.

PARE has worked on several of these school projects as a subconsultant to Ai3 Architects of Wayland, MA. Schools in Plymouth, Natick, and Norwood are under construction, while the design of schools in East Bridgewater, Quincy, and Hingham is currently underway. And soon PARE will begin work on two new school projects in Somerset and Marshfield.

Andrew, Cari, Tom or Devon can provide more information on PARE's involvement on these projects, or visit the following link for the Model School Program:

http://massschoolbuildings.org/programs/model_school

Massachusetts School Building Authority
Funding Affordable, Sustainable, and Efficient Schools in Partnership with Local Communities



Carbon-negative concrete, samples. Brent Constantz (American, b. 1958), Calera Corporation. United States, 2009. Portland cement, Calera aggregate, and supplementary cementitious material (captured CO 2 mineralized as carbonates). Courtesy of designer

Caltech's Experimental VAWT farm

Rendering of Sauer's residential VAWT design

Green Current Events: Vertical Axis Wind Turbines

A smaller, cheaper and more efficient type of wind turbine has been making a name in the news. Vertical Axis Wind Turbines (VAWTs) are an innovative type of turbine where the main rotor shaft is set vertically and the main components are located at the base of the turbine. While wind energy is clean, a farm of 3-blade Horizontal Axis Wind Turbines (HAWTs) requires a large land area and oftentimes controversial environmental disturbances. These traditional turbines average about 40 meters tall, and must be spaced widely in order to avoid creating wakes that will disturb surrounding turbines.

A recent study by the California Institute of Technology used an array of VAWTs measuring about 10m tall and 1.2 m wide spaced in a tight array. Blades of each turbine spin in opposite directions from those adjacent to it, creating currents that benefit the neighboring turbines - a design inspired by the hydrodynamic patterns observed within schools of fish. The density of power created by Caltech's experimental VAWT wind farm was found to be 6-9 times higher than a modern wind farm with standard horizontal-axis turbines. In addition to producing more energy per land area, these smaller turbines are lower to the ground and therefore cause less of an eyesore, and are less likely to harm flying wildlife.

Several companies such as Sauer Energy and Helix have been developing small and affordable models of VAWTs that are designed to provide energy for a single home or office building. Sauer expects that in a typical home, the VAWT would pay for its installation cost (6,000-15,000 dollars) within about 2 years.