

National Sustainable Design Expo

SEE THE FUTURE TODAY!

April 18 - 20, 2009

featuring EPA's

P³award

people,
prosperity
and the planet

*a student design competition
for sustainability*

The National Sustainable Design Expo featuring the U.S. Environmental Protection Agency's (EPA) P³ Award brings together students, nonprofit organizations, and government agencies working to create a sustainable future. This is a unique opportunity to discover innovative, cutting-edge technologies, learn what nonprofit organizations and government agencies are doing to advance sustainability, and meet students studying engineering, sciences, law, economics, and architecture. The Expo takes place each spring on the National Mall in Washington, DC, and is open to the public.

Targeting Sustainability

In a world where water and energy resources are finite and our consumption of goods is increasing, we need more creative ways to integrate social, economic, and environmental goals. The task ahead is to design a sustainable future where the environment is protected, people are prosperous, and the quality of life improves through innovative science, technology, and policy.

P³ (People, Prosperity and the Planet) National Student Design Competition

In 2004, EPA launched P³, a competitive grant program aimed at fostering future generations of scientists, engineers, and decision makers to meet the challenges of sustainability through innovative solutions. Unique in the federal government, this program awards grants to universities for teams of undergraduate and graduate students, along with their faculty advisors, to design and develop solutions to sustainability challenges. The P³ Competition consists of two phases. In Phase I, student teams compete for grants of \$10,000 to research and develop their projects during the academic year. In Phase II, the P³ grantees come to Washington, DC, to compete for the P³ Awards at the National Sustainable Design Expo. The awards provide an opportunity for funding to further develop and implement the award-winning technologies.

Join us as we explore the future today!

This year's Expo is cosponsored by:



Exhibits and P3 Team Projects Open to the Public

Saturday, April 18, 2009 12:00 p.m. – 5:00 p.m.

Sunday, April 19, 2009 9:00 a.m. – 5:00 p.m.

Monday, April 20, 2009 9:00 a.m. – 3:00 p.m.



2009 National Sustainable Design Expo Co-Sponsors



Established in 1970, EPA's mission is to protect human health and the environment. After nearly 40 years, EPA can be proud of its achievements: Americans breathe cleaner air, drink safer water, swim and fish in healthier lakes and streams, and generally have healthier lives.

Now, with an eye toward the future, EPA has increased its emphasis on sustainability. We, as Americans, want our legacy to be a world that is healthier to live in, with natural resources that have not been depleted or destroyed. We all need to understand the environmental, economic, and social consequences of the choices we make as individuals and as a nation. We must forge sustainable approaches that optimize beneficial impacts to the environment, economy, and society. Sustainability requires grass-roots efforts to achieve global solutions and these solutions must be forged in partnership with our families, schools, communities, industries, and the nations of the world.

EPA has dozens of programs, policy tools, and incentives to implement and encourage sustainability. The Agency is working in many ways to help individuals and organizations blend these programs, improve industrial practices, and assist states and local governments to manage their resources effectively. To learn more, visit: www.epa.gov/sustainability.



Beyond Benign is a nonprofit taskforce focused on promoting sustainability and green chemistry in the interdependent arenas of community, K-12 education and industry. We believe that for a society to find environmentally benign solutions to the hazardous materials and products in the marketplace today, everyone must be involved in their communities as informed advocates for safer,

environmentally conscious alternatives. Beyond Benign's mission is to promote environmentally sound science, through the principles of green chemistry, to create an environmentally, socially and economically prosperous world.

Our approach to educating communities on green chemistry and increasing science and environmental literacy is centered on K-12 education and outreach because the K-12 educational experience can significantly affect life-long attitudes, actions and pursuit of careers in science. We recognize that the goal of a sustainable future requires a greater investment in and many more scientists trained in the sciences to help design alternatives to today's technologies.

Beyond Benign is proud to be presenting some of its classroom and outreach activities, designed to demonstrate the importance of sustainable science in a memorable manner that emphasizes "everyone can be a scientist."
www.beyondbenign.org

2009 P³ Teams – Phase I alphabetically by college/university

Project Title

Exhibit Location Challenge Areas

Description

Fuel Production from Coffee Wastes

B-22  

Appalachian State University students are designing and developing a coffee wastewater treatment system to improve the sustainability of coffee production. The project is incorporating the capturing of ethanol and bio-gas from the waste stream for use in the remediation process.

Closing the Carbon Loop: Growing Algae Using CO₂ from Bio-waste

B-13 


Appalachian State University students are designing and building a sustainable algaculture facility for producing biofuels. They are building an algae photobioreactor, growing algae in a solar greenhouse, using a digester for diverting bio-waste from the landfill to produce methane, and recovering the CO₂ to divert it to the algae.

Use of Microorganisms for Biofuel Production and CO₂ Mitigation

C-15   

Austin Peay State University students are converting solar energy and waste CO₂ (carbon dioxide that is released in power plants by burning fossil fuels) into biofuels by sequential use of microalgae and bacteria in bioreactors. The students are testing the produced biofuels, biodiesel, H₂ and ethanol in model engines.

Tap Water as a Sustainable Alternative

D-12 

Butte-Glenn Community College District students are exploring ways to reduce the use of plastic bottled water. The students are conducting a water assessment survey on campus and a public education campaign on the benefits of using tap water and on-site filtration systems.

Evaluating Risk and Disparities in Residential Communities

C-5  

California Lutheran University students are identifying and modeling the transport and behavior of pollutants in the aquatic system of the Ventura River, California watershed. They are also conducting social science surveys to identify concerns of the residents.

Multifunction Energy Platform Pilot

C-14  

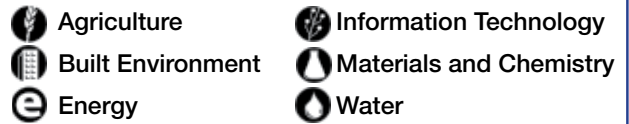
Columbia University students are installing and monitoring a multifunction platform (MFP) in a farming cooperative network in Soroti, Uganda. The MFP provides an important mechanization for agricultural processing, electricity generation, and domestic or irrigation water supply systems.

Architectural Coatings for Increasing Solar Reflection

C-17 

Drexel University students are studying architectural coatings capable of scattering and reflecting UV, Visible, and NIR radiation from the sun to reduce solar gain on the exterior of a building. The student team is using glass hollow microspheres to create the coating.

CHALLENGE AREAS



Anaerobic Stove Design for the Indigenous People of Ecuador

C-16

Fort Lewis College students are designing, developing, and implementing an anaerobic digester with a burner system for villages of indigenous Quechua people in the mountains of central Ecuador. The digester will improve sanitation; reduce greenhouse gas emissions; and reduce demand for wood and charcoal for cooking.

Green Energy for a Dormitory in Kitale, Kenya

D-8

Gonzaga University students are studying the utility of water filtration technologies, biomass utilization and alternative energies for use in a proposed new dormitory. The students are using a total energy balance analysis for the community to ensure the success of the new technology adoption.

An Electric-Assisted Bicycle Competition for High Schools

D-19

James Madison University students are developing an annual design competition for high school students that raises awareness of an alternative commuting vehicle and promotes science, technology, engineering, and mathematics (STEM) disciplines. The students are conducting a survey of college student needs and are building prototype vehicles that will inform the competition rules, design parameters, and judging criteria.

A Sustainable Irrigation Ram Pump for Community Gardening in South Africa

A-18

Johns Hopkins University students are studying ways to improve and promote a locally designed (“Alcock”) ram pump as a solution to problems of irrigation in community vegetable gardens in rural KwaZulu-Natal, South Africa. The study will provide a better understanding of the pumps’ capabilities, and explore design modifications toward improving their performance and manufacturability.

Determining Plantable Area for Switchgrass Biofuel Production in Kentucky

B-12

Kentucky State University students are studying whether prairie switch grass can be planted in Kentucky rights-of-way and then harvested for conversion to biofuel. The students are using geospatial analysis to assess the volume of biofuel that may be produced in the rights-of-way.

Integrated Sustainable Water and Economic Systems in Honduras

D-6

Lafayette College students are creating a sustainable development framework (CODE-PSI) as a conceptual design for rural potable water infrastructure projects in developing countries. The students are adapting CODE-PSI so that it can be used to promote integrated economic activities supported by the water system.

2009 P³ Teams – Phase I alphabetically by college/university

Project Title

Exhibit Location Challenge Areas


Description

Creation of a Multi-Disciplinary Platform for Infrastructure Projects in Developing Countries

D-5  

Lehigh University students are designing and constructing a system for the treatment and distribution of drinking water in Pueblo Nuevo, Honduras. They are also developing a framework which can be adopted by other organizations working on water system improvements in developing countries.

Design and Evolution of Green Synthetic Processes and Bioremediation

C-7 


Leland Stanford Junior University students are studying how iron containing enzymes work in biological systems so they can be applied towards green synthesis and bioremediation. Their goal is to create catalysts (natural or synthetic) that are efficient, economically-viable and contribute a minimal amount of pollution to the environment.

Integrated Waste and Water Management Project

D-11  



Lone Star College-Kingwood students are developing a sustainable integrated waste and water management project for a newly-built rural community in Batangas, Philippines. They are developing a methodology for solid waste management and wastewater treatment to reduce water pollution and water-borne diseases.

A Design for Renewable Energy Power Generation

D-14 



Massachusetts Institute of Technology students are developing and demonstrating a modular renewable energy cogeneration system that can use solar and organic resources. The design combines concentrating solar thermal and biofuel technologies to increase the efficiency of power generation and decrease the CO₂ emissions compared to a Diesel generator.

Design of a Small – Scale Solar Chimney for Sustainable Power

D-21  







Minnesota State University – Mankato students are designing and testing a small-scale solar chimney for use as a renewable energy source. The students seek to minimize the initial cost while creating a system with little to no long term cost (i.e. the power source is free, renewable, and maintenance is minimal).

Solar Collector and Storage Kit Made with Tire Inner Tubes and Other Readily Available Materials

D-22  

Minnesota State University – Mankato students are designing, building, and testing a solar-hot-water system that is made with tire inner tubes and/or other readily available materials for developing nations. The system could be packaged as a kit and easily distributed and assembled.

CHALLENGE AREAS

 Agriculture	 Information Technology
 Built Environment	 Materials and Chemistry
 Energy	 Water

Residential Building Adaptive Energy Management System (R-BAEMS) Design

A-15 

Missouri University of Science and Technology students are measuring the environmental impact of automated energy management systems for residential structures. The students are investigating the type, usage and placement of sensors to monitor temperature and humidity and actuators to modify the interior climate.

A Design for Solar Thermal Electric Panels (STEP)

A-16 

Missouri University of Science and Technology students are designing a solar thermal and electric energy hybrid roof panel system in a modular form so that alternative energy sources are available and affordable for typical homes. They are conducting a full-scale test of the prototype.

A Self-contained Solar Powered Lighting System for Developing Nations

C-4  

Rochester Institute of Technology students are designing, building, and conducting preliminary tests of a prototype LED lamp to be used in developing nations as an inexpensive source of light. The approach will be to integrate energy collection and storage, as well as light emission, into one manageable package.

A Process for Biological Nitrogen Removal from Dairy Wastewater in Constructed Wetlands

A-13  

SUNY College of Environmental Science and Forestry students are studying ecologically-engineered treatment systems that will remove nitrogen from dairy wastewater. The students are designing and testing mesocosm constructed wetlands to incorporate partial nitrification and anaerobic ammonium oxidation.

Improving Hydrologic Sustainability of Texas A&M University Campus

B-7  

Texas A&M students are collecting rainfall, runoff, and environmental data and simulating hydrologic conditions to quantify stormwater runoff impacts on campus. Stormwater management plans are developed using new hydrologic sustainability metrics, such as the Hydrologic Footprint Residence (HFR), which captures the change in the downstream floodplain and the duration of the flood's residence.

Solar Evaporation Array

B-6  

University of Alabama students are developing the Solar Evaporation Array (SEA) panel, a desalination and water-purification apparatus powered by the sun. The SEA panels will produce potable, irrigable water for a much lower cost than existing methods, as well as reduce and possibly eliminate brine pollution.


2009 P³ Teams – Phase I alphabetically by college/university

Project Title

Exhibit Location Challenge Areas

Description

An Aquaculture System with Assessment of Environmental, Social, and Economic Implications

A-3 

University of Arizona students are designing and testing a recirculating aquaculture production system. The team is assessing fish and plant growth rates, water nutrient chemistry, soil quality, and resource economics to determine the conditions that promote economically viable and environmentally sound food production.

User-friendly Solar Ovens for Outdoor and Indoor Use

A-4  


University of Arizona students are developing a safer and user-friendly solar oven for indoor and outdoor cooking. The solar oven will include an effective solar tracking control system, a Fresnel lens and optical system, and a metal block for heat conduction and hot surface.

A Process for Biodiesel Production Using Supercritical Methanol

A-2  

University of Arkansas-Fayetteville students are evaluating the use of a supercritical methanol treatment and ultrasonic stimulation for production of biodiesel from variable composition feedstock. The students are focusing on development and optimization of a process for conversion of a variety of bio-oils to biodiesel.

Production of Butanol from Biomass Using Novel Membrane Reactor

A-11 

University of Arkansas-Fayetteville students are exploring the use of a novel membrane reactor for the production of butanol from biomass-derived sugars as a sustainable and greener energy alternative biofuel. The students are preparing a full economic analysis using bench scale results to predict commercial-scale feasibility.

Green Roof Sustainability in Dry Climates

A-20  

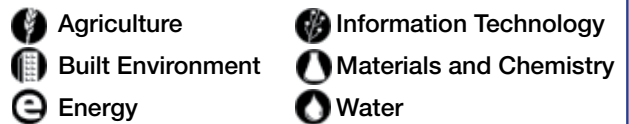
University of California, Davis students are developing methods to determine the efficacy of green roofs in dry, hot, climate zones such as inland California and other regions of the Western U.S. Green roof performance (regarding lifecycle energy, carbon footprint, and cost) will be compared to conventional and white roofs and other potential benefits, such as improved stormwater management due to extended duration of roof drainage during intense rainfall events, will be evaluated.

Eco-Friendly Synthesis of Pharmaceuticals

B-18 

University of California, Los Angeles students are studying the synthesis of biologically active pharmaceuticals using a solid state reaction as the key step. By carrying out this chemoselective reaction in the solid state, they can avoid the use of solvents and unwanted byproducts, thereby reducing toxic waste.

CHALLENGE AREAS



Solar Disinfection of Water in Developing Countries

A-17

University of Cincinnati students and collaborators from Ireland and Mexico are studying novel nanotechnological methods for use in photocatalytic point-of-use reactors for water disinfection in isolated rural zones in Mexico. The students are also documenting health benefits associated with the consumption of the treated drinking water.

Identifying Sustainability Indicators for Bioenergy Products from Pine Forests

D-1

University of Florida students are developing a framework for four sustainability indices for bioenergy production. The indices are 1) economic; 2) biodiversity; 3) greenhouse gas emission reduction and net energy ratio; and 4) soil and water quality.

Water Capture and Filtration System for Arid Rural Communities

D-10

University of Florida students have designed a low-tech, low-cost filtration system for an open pool reservoir in western Africa. The students are now measuring the efficacy of the design by using the amount of water collected during the first year and the length of time residents are able to survive off of the collected water as guides.

Pathways to the 3 Rs: Reduce, Reuse, Recycle

B-17

University of Maryland University College students are educating the public on ways to reduce, reuse, and recycle so there is a reduction of landfill material and pollution runoff. Users can access an interactive map to find local resources for reuse and recycling, and discuss ways to reduce wastes, with emphasis on “solutions that begets solutions.”

Carbon Credit Biofuels Program in Madagascar

C-13

University of Michigan students are developing an approach for securing carbon credits to support the creation of integrated biofuels projects. The project links the energy, land use and transport sectors and may help reduce greenhouse gases, improve public health and benefit the local economy.

Environmental Design for Improving Air Quality and Advancing Equity in Southwestern Detroit

C-12

University of Michigan students are identifying interventions that will reduce ambient fine particulate matter in southwestern Detroit. This area is one of the most concentrated pockets of heavy industrial manufacturing in the U.S. and the students are working with a number of local environmental justice organizations to reduce air pollution for the 152,000 area residents.

2009 P³ Teams – Phase I alphabetically by college/university

Project Title

Exhibit Location Challenge Areas

Description

Removal of Arsenic from Groundwater in Inner Mongolia (China)

A-10  

University of Pittsburgh students are designing a low-cost process for effective removal of arsenic from groundwater. The students are using magnetic particles of naturally occurring iron oxide as adsorbents to remove the arsenic.

Water Awareness, Research and Education in East Tampa, FL

B-15  

University of South Florida students are studying community education and awareness, as a way of reducing local pollutant inputs to stormwater retention ponds. The students are developing a curriculum for middle school students, as well as stormwater retention pond demonstration modules and community based tours.

Permeable Parking: A Green Approach to Managing Water Runoff

B-9  

University of St. Francis students are building a test parking lot of permeable pavement with a water collection system. The design will be tested for the reduction of demand on municipal storm drains and potential re-use of the rain water for irrigation of green spaces.

The New Norris House: A Sustainable Home for the 21st Century

D-17  

University of Tennessee - Knoxville students are designing a sustainable home based on the original Norris House concept, homes originally built by TVA in 1933 a part of Norris - a New Deal model community. The students are resolving technological challenges, as well as assessing the legal, social, and aesthetic issues that currently restrict green construction.

Refining and Utilization of Waste Glycerol

D-3  

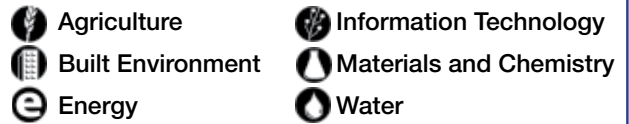
University of Tennessee - Knoxville students are developing a system for the small scale refining and recovery of glycerol, a byproduct of biodiesel production, produced locally by micro-manufacturers. The goal is to recover the glycerol, which is a waste product, and produce a marketable product.

Groundwater Depletion: The Buried Problem

B-1  

University of Wisconsin (UW) students have developed a rain water catchment system for the Wisconsin Institute for Medical Research, located on the UW campus. The system collects and utilizes rainwater for irrigation in order to minimize groundwater depletion and contamination.

CHALLENGE AREAS



Returning P³ Team from 2008

Project Title

Exhibit Location Challenge Areas

Description

Design and Monitoring of a Sustainable Affordable Housing Community in Southwest Florida

C-2  

Florida Gulf Coast University students have developed a sustainable, affordable home design and monitoring program in southwest Florida. The houses are energy efficient, hurricane and termite resistant, and are equipped with solar water heaters and solar tubes for natural lighting. Energy savings and efficiencies are being documented through a monitoring program.

Phase II Teams - 2007/2008 P³ Award Winners

Project Title

Exhibit Location

Description

Novel Reactor Design for Biodiesel Production

A-9

Drexel University students are designing a novel reactor for producing biodiesel from alternative feedstocks. The reactor minimizes excessive soap production while increasing the efficiency of conversion to biodiesel and is especially suited for low-value waste oils such as yellow grease and trap grease.

Innovative Biodiesel Production

B-4

Loyola University of Chicago students are developing educational modules for high school students that use portable diesel production labs. The high school students will produce biodiesel fuel and learn about sustainable energy practices.

Sustainable Water Development for Rural Nigeria

B-20

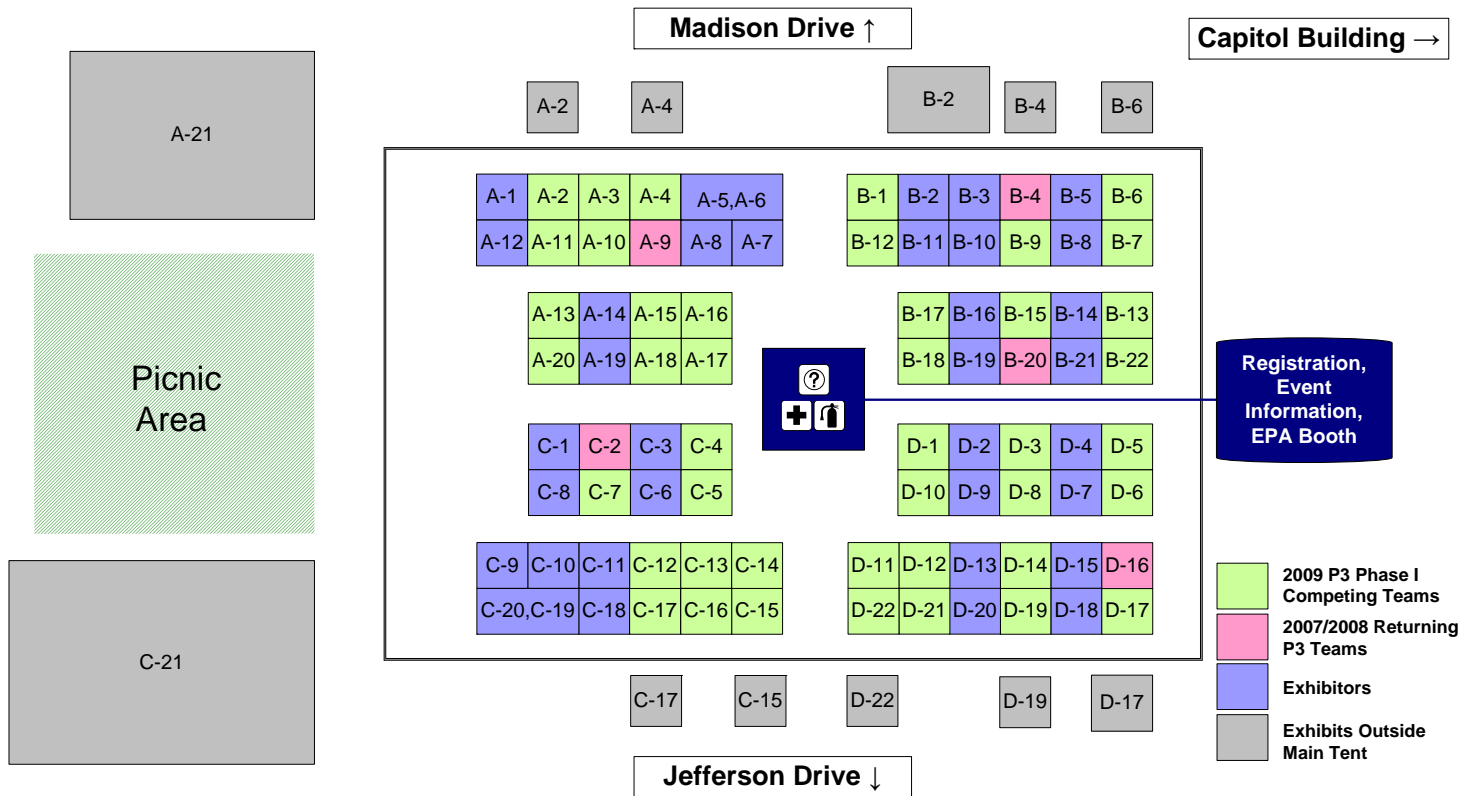
University of Illinois at Urbana-Champaign students are developing an environmentally sensitive design for a community-based drinking water supply system in rural Nigeria. The team will work with the community to develop a comprehensive program to include design, implementation, oversight, and education.

The Learning Barge: Environmental + Cultural Ecologies on the Elizabeth River

D-16

University of Virginia students are completing construction of a floating environmental education field station powered by solar and wind energy systems. The Learning Barge will be launched in August 2009 as an interactive K-12 educational resource for Virginia schools.

2009 National Sustainable Design Expo Floor Plan



- A-1 Fair Trade Federation and Fair Trade Resource Network
- A-2 University of Arkansas at Fayetteville: Biodiesel Production
- A-3 University of Arizona: Aquaculture System
- A-4 University of Arizona: Solar Ovens
- A-5 U.S. Army Corps of Engineers
- A-6 U.S. Army Corps of Engineers
- A-7 U.S. Army Corps of Engineers
- A-8 North American Association for Environmental Education (NAAEE)
- A-9 Drexel University
- A-10 University of Pittsburgh
- A-11 University of Arkansas at Fayetteville: Production of Butanol
- A-12 U.S. EPA and the U.S. Government Printing Office
- A-13 SUNY College of Environmental Science and Forestry

- A-14 Sustainable Agriculture Education Association
- A-15 Missouri University of Science and Technology: R-BAEMS Design
- A-16 Missouri University of Science and Technology: STEP Design
- A-17 University of Cincinnati
- A-18 Johns Hopkins University
- A-19 Virginia Tech
- A-20 University of California - Davis
- A-21 U.S. EPA, Energy Star Program
- B-1 University of Wisconsin
- B-2 Electric Vehicle Association of Greater Washington, DC
- B-3 Potomac Region Solar Energy Association
- B-4 Loyola University of Chicago
- B-5 U.S. EPA Regions
- B-6 University of Alabama
- B-7 Texas A&M University

- B-8 U.S. EPA Office of Water
- B-9 University of St. Francis
- B-10 American Institute of Architects (AIA),
Committee on the Environment/DC Chapter
(COTE/DC)
- B-11 University of Tennessee's Institute for Secure
and Sustainable Environment
- B-12 Kentucky State University
- B-13 Appalachian State University: Closing the
Carbon Loop
- B-14 Alliance to Save Energy
- B-15 University of South Florida
- B-16 Sustainable Forestry Initiative
- B-17 University of Maryland University College
- B-18 University of California - Los Angeles
- B-19 American Council On Renewable Energy
(ACORE)
- B-20 University of Illinois at Urbana-Champaign
- B-21 Green Building Institute
- B-22 Appalachian State University: Fuel Production
from Coffee Wastes
- C-1 National Council for Science and the
Environment (NCSE)
- C-2 Florida Gulf Coast University
- C-3 Peace Corps
- C-4 Rochester Institute of Technology
- C-5 California Lutheran University
- C-6 NAHBGreen
- C-7 Leland Stanford Junior University
- C-8 U.S. EPA Office of Pollution Prevention and
Toxics
- C-9 U.S. EPA Green Chemistry Program and U.S.
EPA Green Engineering Program
- C-10 U.S. EPA Design for the Environment (DfE)
Program
- C-11 Wissahickon Charter School
- C-12 University of Michigan: Improving Air Quality
- C-13 University of Michigan: Carbon Credit Biofuels
Program
- C-14 Columbia University
- C-15 Austin Peay State University
- C-16 Fort Lewis College
- C-17 Drexel University
- C-18 Engineers Without Borders (EWB)-USA
- C-19 American Society of Civil Engineers (ASCE)
- National Capital Section and Committee on
Sustainability
- C-20 American Society of Civil Engineers (ASCE)
- National Capital Section and Committee on
Sustainability
- C-21 Beyond Benign
- D-1 University of Florida: Sustainability Indicators
- D-2 Youth Council on Sustainable Science and
Technology (YCOSST)
- D-3 University of Tennessee - Knoxville: Waste
Glycerol
- D-4 Virginia Sustainable Building Network (VSBN)
- D-5 Lehigh University
- D-6 Lafayette College
- D-7 U.S. EPA, Indoor Environments Division, Indoor
airPLUS Program
- D-8 Gonzaga University
- D-9 Green Map System
- D-10 University of Florida: Water Capture and
Filtration System
- D-11 Lone Star College - Kingwood
- D-12 Butte Community College
- D-13 Carbonfund.org
- D-14 Massachusetts Institute of Technology
- D-15 Centers for Disease Control and Prevention/
National Center for Environmental Health and
the Agency for Toxic Substances and Disease
Registry
- D-16 University of Virginia
- D-17 University of Tennessee - Knoxville: New Norris
House
- D-18 TBD
- D-19 James Madison University
- D-20 U.S. Department of Energy, Office of Energy
Efficiency and Renewable Energy
- D-21 Minnesota State University - Mankato: Solar
Chimney
- D-22 Minnesota State University - Mankato: Solar
Collector

Exhibitors for 2009

Organization

Exhibit Location

Description

Alliance to Save Energy

B-14

The Alliance to Save Energy supports energy efficiency as a cost-effective energy resource under existing market conditions and advocates energy-efficiency policies that minimize costs to society and individual consumers, and that lessen greenhouse gas emissions and their impact on the global climate. To carry out its mission, the Alliance to Save Energy undertakes research, educational programs, and policy advocacy, designs and implements energy-efficiency projects, promotes technology development and deployment, and builds public-private partnerships, in the U.S. and other countries.

www.ase.org

American Council On Renewable Energy (ACORE)

B-19

ACORE, a 501(c)(3) membership nonprofit organization headquartered in Washington, D.C., is dedicated to bringing renewable energy into the mainstream of the U.S. economy and lifestyle through information and communications programs. ACORE provides a common platform for its 650 corporate and organizational members and the wide range of interests in the renewable energy community, including renewable energy industries, associations, utilities, end users, professional service firms, financial institutions and government agencies. ACORE serves as a forum through which these parties work together on common interests. ACORE has issued a Call for Action to all renewable energy organizations, asking each to come forward with its Action Plan for the Obama Administration to help achieve the DREAM: Double Renewable Energy in America. Join us in being part of the DREAM.

www.acore.org

American Institute of Architects (AIA), Committee on the Environment/DC Chapter (COTE/DC)

B-10

Promoting the awareness and participation of allied building professionals and the general public about the practices of sustainable design and green building. This is achieved through monthly lectures, as well as educational and social events.

<http://www.aiadc.com/COTEdcmis.asp>

American Society of Civil Engineers (ASCE) – National Capital Section and Committee on Sustainability

C-19 and C-20

ASCE, an engineering professional society, is a global leader in sustainability through its ongoing programs and partnerships: Practice, Education and Research for Sustainable Infrastructure (PERSI), Engineers Forum on Sustainability (co-sponsored with AAES, ASEE, AIChE, IEEE, & ASME International) and Engineers Without Borders - USA.

**www.asce-susdev.org; www.asee.org/resources/organizations/efsnewsletter.cfm;
www.ewb-usa.org**

“Now I truly believe that we in this generation must come to terms with nature, and I think we're challenged, as mankind has never been challenged before, to prove our maturity and our mastery, not of nature but of ourselves.”
- Rachel Carson

Beyond Benign

C-21

Beyond Benign seeks to educate communities to inspire future scientists and to create more informed consumers and voters. Beyond Benign's outreach to all parts of the community is centered on the concepts of green chemistry and sustainable science because only through sustainability-minded actions and decisions will we meet the demands of current and future society for materials, medicines, and social and economic justice.

Beyond Benign is hosting a Sustainability Classroom as an essential and integrated part of the National Sustainable Design Expo. The Sustainability Classroom has three aspects: 1) engaging the public, 2) engaging K-12 students and classrooms and 3) engaging the business community. The Classroom is open to the public and houses interesting and engaging activities that define and highlight sustainability and the environmental, economic and social issues related to sustainability.

Beyond Benign is providing activities that tie sustainability concepts to real-world examples. Beyond Benign is also presenting new activities that incorporate specific examples of sustainable design by involving children, parents, teachers and passersby with P³ Expo teams and the team displays. Additional Expo-specific activities will make use of real-world industrial examples of sustainable design and sustainable business practices.

www.beyondbenign.org

Carbonfund.org: Reduce What You Can, Offset What You Can't™

D-13

Carbonfund.org is the country's leading nonprofit climate solutions organization, making it easy and affordable for individuals, businesses and organizations to reduce their climate impact. Carbon offsets enable individuals and businesses to reduce carbon dioxide emissions they are responsible for in their everyday lives by supporting third-party validated renewable energy, energy efficiency and reforestation projects where they are most cost effective. Our partners include Discovery Communications, Amtrak, JetBlue, Motorola, Volkswagen, Orbitz, and Staples.

www.carbonfund.org

Centers for Disease Control and Prevention (CDC)/National Center for Environmental Health (NCEH) and the Agency for Toxic Substances and Disease Registry (ATSDR)

D-15

CDC's National Center for Environmental Health and the Agency for Toxic Substances and Disease Registry scientifically consider all factors that affect the health of people, including healthy community design.

www.cdc.gov/nceh and www.atsdr.cdc.gov

Exhibitors for 2009 (continued)

Organization

Exhibit Location

Description

Electric Vehicle Association of Greater Washington, DC

B-2

Electric Vehicle Association of Greater Washington, DC (EVADC), a chapter of the international Electric Auto Association, has been educating the American public on Electric Vehicle (EV) / Plug-in Hybrid EV (PHEV) technology for a greener, cleaner, and more sustainable world, since 1980. EVs and PHEVs as key technologies will be on display.

www.EVADC.org

Engineers Without Borders

C-18

Engineers Without Borders - USA (EWB-USA) is a non-profit humanitarian organization established to partner with developing communities worldwide in order to improve their quality of life. This partnership involves the implementation of sustainable engineering projects, while involving and training internationally responsible engineers and engineering students.

www.ewb-usa.org; www.ewb-dc.org; and <http://engineering.cua.edu/activities/EWB>

The Fair Trade Federation and Fair Trade Resource Network: Great Products and Tremendous Impact

A-1

The Fair Trade Federation is the trade association that strengthens and promotes North American organizations fully committed to fair trade. The Fair Trade Resource Network is a non-profit organization dedicated to raising consumer awareness about fair trade alternatives by providing information to the public, the media and advocates.

www.FairTradeFederation.org

Green Building Institute

B-21

Serving the Northern Virginia, D.C. & Maryland regions, the Green Building Institute, a 501(c)(3) non-profit organization, educates the public and building and design professionals about sustainable building practices and technologies. The Green Building Institute offers classes and workshops on rainwater collection, energy efficiency, green roofs, solar energy, home energy audits, passive solar energy and more. With close to 3,500 individuals and organizations as participants, the GBI network provides significant outreach and networking opportunities for homeowners and professionals throughout the building industry.

www.greenbuildinginstitute.org

Green Map System

D-9

Green Map System engages communities across the United States and around the world in mapping their progress toward a sustainable future! An international collaborative begun in NYC in 1995, Green Map System has empowered a diverse global movement of local mapmaking teams charting natural, social, and cultural resources in their own hometowns. Meet the staff, talk with Green Mapmakers from Baltimore, and see a demonstration of the OpenGreenMap.org social mapping platform-in-progress, designed to help significantly more people participate.

www.greenmap.org

“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.”
- Margaret Mead

NAHBGreen

C-6

NAHBGreen, the National Green Building Program for the housing industry, is a set of awareness, training, and home certification resources sponsored by the National Association of Home Builders to help your community go green. Through education and construction rigor, NAHBGreen brings national, state and local home building industries together. Now, home builders and remodelers all over the country can take advantage of this voluntary, market-driven and cost-effective way to think green, build green and pass green on to America's homeowners. NAHBGreen allows any home, anywhere to go green.

www.nahbgreen.org

National Council for Science and the Environment (NCSE)

C-1

The National Council for Science and the Environment improves the scientific basis of environmental decision-making through collaborative programs with diverse communities, institutions, and individuals. NCSE operates programs in five strategic areas: Providing Science Solutions; Strengthening Education; Organizing the National Conference on Science, Policy and the Environment; Communicating Science Based Information; and Advancing Science Policy on the National Level. NCSE supports the advancement of degree-granting environmental programs on the nation's campuses with over 160 universities and colleges as members.

www.ncseonline.org

North American Association for Environmental Education (NAAEE)

A-8

NAAEE is the professional association for environmental education -- a network of people who believe in teaching people how to think about the environment, not what to think. Learn how to use high-quality teaching methods to show people how to make a difference in the world through a positive, nonconfrontational approach. Our members promote professional excellence in nonformal organizations, K-12 classrooms, universities (both instructors and students), government agencies, and corporate settings throughout North America and in over 55 other countries.

www.naaee.org

Peace Corps

C-3

Since 1961, more than 195,000 volunteers have served in the Peace Corps, working in such diverse fields as education, health, HIV/AIDS education and prevention, information technology, business development, the environment, and agriculture. Peace Corps volunteers must be U.S. citizens and at least 18 years of age. Peace Corps service is a 27-month commitment.

www.peacecorps.gov

Potomac Region Solar Energy Association

B-3

The Potomac Region Solar Energy Association (PRSEA) is a non-profit organization whose purposes are to further the development, use of, and support for solar energy and related arts, sciences, and technologies with concern for the economic, environmental, and social fabric of the region.

www.prsea.org

Exhibitors for 2009 (continued)

Organization

Exhibit Location

Description

Sustainable Agriculture Education Association (SAEA)

A-14

The SAEA champions better educational approaches for sustainable agriculture through the development, application, and research of teaching and learning practices. Our primary activity has been hosting participatory conferences. These gatherings provide a unique opportunity for our members to exchange ideas through in-depth discussions. Our Web site includes a digital library, a searchable and cross-referenced database of education resources for sustainable agriculture.

<http://sustainableaged.org/>

Sustainable Forestry Initiative (SFI Inc.)

B-16

The Sustainable Forestry Initiative is an independent, non-profit, charitable organization with a science-based, internationally recognized forest management standard developed specifically for North American forests. Our mission is to help protect the health of our forests while supporting the co-existence of responsible environmental behavior and sound business practices. Today the SFI program is one of the largest and fastest growing forest certification programs in the world involving more than 700 organizations.

www.sfiprogram.org

University of Tennessee's Institute for a Secure and Sustainable Environment

B-11

The University of Tennessee's Institute for a Secure and Sustainable Environment promotes development of policies, technologies, and educational programs that cut across multiple disciplines, engage the university's research faculty and staff, and grow in response to pressing environmental and security issues facing the state, the nation, and the globe.

isse.utk.edu

U.S. Army Corps of Engineers

A-5, A-6, and A-7

The U.S. Army Corps of Engineers specializes in military construction, civil works (levees, dams, navigation, etc.), and disaster response, always focused on engineering solutions for a sustainable and secure future.

www.usace.army.mil

U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy

D-20

The Office of Energy Efficiency and Renewable Energy (EERE) works to strengthen the United States' energy security, environmental quality, and economic vitality in public-private partnerships. It supports this goal through: Enhancing energy efficiency and productivity; Bringing clean, reliable and affordable energy technologies to the marketplace; and Making a difference in the everyday lives of Americans by enhancing their energy choices and their quality of life.

www.eere.energy.gov

“ *If we all did the things we are capable of,
we would astound ourselves.* ”
- Thomas Edison

U.S. EPA and the U.S. Government Printing Office: Printing GREEN

A-12

The EPA's Office of Research and Development and the U.S. Government Printing Office are joining forces to explore the latest in sustainable printing while “Keeping America Informed” about EPA science. Stop by to see printing samples, pick up the latest EPA science communication news, and sign up for EPA announcements.

U.S. EPA Change the World, Start with ENERGY STAR

A-21

Change the World, Start with ENERGY STAR® is a national campaign from the EPA encouraging all Americans to take small steps to reduce energy use at home, at work, and in their community. The exhibit is a custom-built, interactive structure modeled after an energy-efficient home in which visitors can walk through and learn room-by-room ways to save energy, save money, and help protect the environment by using ENERGY STAR qualified products and energy-efficient practices.

www.energystar.gov/changetheworld

U.S. EPA Design for the Environment (DfE) Program

C-10

EPA's Design for the Environment (DfE) Program allows products that are safer for the environment and safer for families to carry the DfE label. DfE works in partnership with a broad range of stakeholders to reduce risk to people and the environment by preventing pollution. In 2008, DfE's efforts eliminated the use of over 335 million pounds of chemicals of concern.

www.epa.gov/dfe

U.S. EPA Green Chemistry Program & U.S. EPA Green Engineering Program

C-9

The EPA Green Chemistry Program and Green Engineering Program are voluntary, partnership programs that promote innovative chemistry and engineering technologies that reduce or eliminate the use or generation of hazardous substances in the design, manufacture and use of chemical products and processes.

www.epa.gov/greenchemistry and www.epa.gov/oppt/greenengineering/

U.S. EPA, Indoor Environments Division, Indoor airPLUS Program

D-7

EPA's Indoor Environments Division seeks to reduce human health risks posed by contaminants in indoor environments. EPA created the Indoor airPLUS new home label to help builders meet the growing consumer preference for homes with improved indoor air quality. This program is a complementary label to ENERGY STAR for New Homes; only ENERGY STAR qualified homes are eligible for this label.

<http://www.epa.gov/indoorairplus/>

Exhibitors for 2009 (continued)

Organization

Exhibit Location

Description

U.S. EPA Office of Pollution Prevention and Toxics

C-8

EPA's Office of Pollution Prevention and Toxics (OPPT) manages programs under the Toxic Substances Control Act (TSCA) and the Pollution Prevention Act (PPA) of 1990. Under these laws, EPA evaluates new and existing chemicals and their risks, and finds ways to prevent or reduce pollution. OPPT also manages a variety of environmental stewardship programs that encourage companies to reduce and prevent pollution.

www.epa.gov/oppt

U.S. EPA Office of Water

Sustainable Stormwater Management to Reduce Runoff:

slow it down, spread it out, soak it in.

B-8

EPA's Office of Water is taking a cross-office approach to reducing the impacts of stormwater runoff, through both regulatory and voluntary programs. On the regulatory side, the National Pollutant Discharge Elimination System (NPDES) Stormwater Program issues stormwater discharge permits to construction site operators, industrial facilities and municipal separate storm sewer systems (MS4s), and provides training and outreach to help these dischargers reduce stormwater runoff pollution. On the voluntary side, the Nonpoint Source Pollution Control Program promotes the use of low impact development (LID) practices as an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible, and provides technical and financial assistance to demonstrate the benefits of treating stormwater as a resource rather than a waste product. This combined approach expands the target audience from the regulated community to include residents and commercial developers, increasing the widespread adoption of these innovative practices.

www.epa.gov/nps/lid and www.epa.gov/greeninfrastructure

U.S. EPA Regions: Greening the Regional Laboratories

B-5

EPA's laboratories are changing their day to day business by implementing sustainable practices including water and energy conservation. Additionally, the Regional Labs are investing in infrastructure that will also improve sustainability.

www.epa.gov/regional/rst.htm

Virginia Sustainable Building Network (VSBN)

D-4

VSBN promotes environmentally sound building practices for Virginia. Founded in 1995, VSBN has developed a statewide network of representatives from housing, banking, utility, construction, government, and environmental interests to change the way homes, commercial buildings, and communities are built in Virginia. In 2009, VSBN is turning its attention to formation of a Green Building Training Partnership, which will bring together state-of-the-art training for the design, construction, and building management sectors.

www.vsbnet.org

“Wherever we look upon this earth, the opportunities take shape within the problems.”
- Nelson A. Rockefeller

Virginia Tech: Design of a Stream Denitrifying Biofilm

A-19

Nutrient pollution from excess nitrogen and phosphorous accounts for much of the water degradation in the United States. While there are a variety of best management practices (BMPs) that can be implemented to reduce levels of nitrogen and phosphorus, there are currently no methods that combine the denitrifying processes used in wastewater treatment and the pollution prevention methods of nonpoint source (NPS) pollution management to reduce nutrient contamination. The construction of a biofilm that utilizes bacteria and substrates found in a stream will create an eco-friendly solution to filter runoff water.

www.bse.vt.edu

Wissahickon Charter School

C-11

Under the SmartFuel Project, middle school students built a biodiesel processor, and make their own fuel from waste vegetable oil from local restaurants. The fuel is used in vans students take on trips.

www.wissahickoncharter.org

The Youth Council on Sustainable Science and Technology (YCCOST)

D-2

The Institute for Sustainability (IFS), an American Institute of Chemical Engineers (AIChE) Technological Community, has partnered with SustainUS to form the Youth Council on Sustainable Science and Technology (YCCOST). YCCOST's mission is to create an understanding about sustainability issues and principals, raise awareness of the science and technology behind sustainable choices, and develop grass root campus efforts for students in diverse disciplines. SustainUS is a nonprofit, nonpartisan organization of young people advancing sustainable development and youth empowerment in the United States through proactive education and advocacy at the policy-making and grassroots levels.

www.aiche.org/IFS/Youth and www.sustainus.org

EPA's P³ Award

The P³ Award competition enables college students to research, develop, and design scientific and technical solutions to sustainability challenges. More than 350 students and their faculty advisors will compete for the 5th Annual P³ Award and the opportunity for an additional \$75,000 grant to move their designs to the marketplace or to implement them in the field.

A panel convened by the American Association for the Advancement of Science (AAAS) will judge the competition on April 18-19, 2009. EPA will choose and announce the P³ Award winners on April 20.

Founded in 1848, AAAS serves some 262 affiliated societies and academies of science, serving 10 million individuals. The nonprofit AAAS is open to all and fulfills its mission to “advance science and serve society” through initiatives in science policy; international programs; science education; and more.



Other Awards

American Institute of Chemical Engineers, Youth Council on Sustainable Science and Technology (YCOSST) Award

The Youth Council on Sustainable Science and Technology (YCOSST), a joint project of the American Institute of Chemical Engineers-Institute for Sustainability (AIChE-IfS) and SustainUS, will donate \$1,000 to the team awarded the 2009 YCOSST P³ Award. The criteria for the award include considerations regarding development, deployment to regions with limited resources, materials, and youth involvement. Specifically, the judges will consider involvement of interdisciplinary collaboration; use of novel, innovative technologies to facilitate distance communication during research; employment of sustainable practices during research; ability of youth or people without significant financial ability or property rights to obtain and use the device or invention; use of materials that are locally produced and available to the general population; ability of local populations to maintain the device or invention; integral involvement of youth in implementation; and direct benefit to youth.

ASCE/EWB Sustainable Development Award

The American Society of Civil Engineers (ASCE) National Capital Section, ASCE Committee on Sustainability and the Engineers Without Borders (EWB) DC Chapter jointly sponsor the ASCE/EWB Sustainable Development Award. The \$1,000 award recognizes the student team which best represents the project that solves a pressing need in a developing country. The selection criteria are: use of local raw materials; simplicity of design; plan for engagement of multidisciplinary stakeholders; and widespread impact on quality of life for the developing region.

Greening the Expo

In keeping with the goals of EPA's P³ program, the National Sustainable Design Expo strives to follow environmentally sustainable practices.

Here's how we do it:

- Use nondisposable rental equipment
- Generate electricity from a renewable resource (biodiesel fuel)
- Turn off equipment when not in use
- Support green companies through environmentally preferable purchasing
- Locate the event in an area accessible by public transportation
- Minimize use of commercial plastic water bottles
- Recycle paper, aluminum, and plastic
- Promote the event and communicate with stakeholders electronically whenever possible
- Provide resource protection for the National Mall
- Use 100% post-consumer recycled paper for event literature
- Print event literature double-sided
- Design reusable banners and signage
- Use recycled glass for P³ Awards
- Use frames made of recycled wood for P³ Award Certificates
- Distribute lanyards made from recycled materials
- Recycle plastic name tag holders

Ways you can join us next year:

Partner

- **Federal partners.** We invite Federal Agencies to join us in managing the P³ Program. Our Federal partners can sponsor additional Phase I and Phase II grants that support their Agency's mission. They may work with EPA to refine the Program including additional solicitation topics and participate in the peer review process.

- **Curricula based on student team projects.** Partners can develop educational materials based both on specific team projects and the general approach to hands on learning and implementation of the P³ program.
- **Advice and support for international and domestic implementation.** Partners can provide guidance and advice to students for implementing their projects in the developing world and/or in their communities in the U.S.
- **Participation in the national sustainability conversation.** Partners can contribute programming ideas for the National Expo that will add to a national conversation on sustainability education, research, and implementation, drawing on the expertise of the teams' advisors and Expo exhibitors.
- **Networking for Team Advisors.** Partners can serve as a resource for team advisors and/or invite P³ awardees to speak about their projects at annual conferences or other events.

Co-Sponsor

Co-sponsors can enhance the Expo experience while promoting recognition of their organization. They may help with general or specific financial support for the Expo, such as for sponsored receptions, videotaping and photography.

Exhibitor

Exhibitors will have an opportunity to interact with other environmentally conscious exhibitors from universities, government agencies, and non-governmental organizations. Exhibitors can describe career opportunities and give advice to the student participants.

P³ Team and P³ Faculty Advisor

Each P³ interdisciplinary student team must have a university or college faculty member as an advisor. Advisors and teams are expected to attend the National Sustainable Design Expo and the P³ Award ceremony in Washington, DC, in the spring. If you want to make sure you are notified about upcoming requests for applications, sign up at http://cfpub.epa.gov/ncer_lists/. Requests for applications open in August and close in December.

See www.epa.gov/P3 for more information about any of these opportunities.

Join us as we explore the future today!

This year's Expo is cosponsored by:

