

THE SUPER COMPUTING SCIENCE CONSORTIUM

Pennsylvania-West Virginia partners in development of clean power technologies.

Formed in 1999 and supported by the U.S. Department of Energy, the Super Computing Science Consortium is a regional partnership of research and educational institutions in Pennsylvania and West Virginia. (SC)² provides intellectual leadership and advanced computing and communications resources to solve problems in energy and the environment and to stimulate regional high-technology development and education.

Through (SC)², Evergreene Technology Park in Greene County provides a channel for companies to collaborate with local universities in southwest Pennsylvania and West Virginia and to have access to PSC computing resources.

Since the spring of 2000, a high-speed network — the first fiber-optic service to Morgantown, West Virginia — has linked the National Energy Technology Laboratory (NETL) campuses in Morgantown and Pittsburgh with PSC, facilitating NETL collaborations. Researchers at NETL and WVU have actively used this link to tap PSC computational resources. Since the founding of (SC)², 50 (SC)² researchers have used PSC systems for a range of projects, using more than 4.5-million hours of computing time, nearly 700,000 hours within the past year.

This work includes:

- **Clean Liquid Fuel from "Syngas"**
<http://www.psc.edu/science/2006/sc2/>
- **Fuel-Quality Hydrogen from Fossil Fuels**
<http://www.psc.edu/science/2005/sc2/>
- **Gas from Black Liquor**
<http://www.psc.edu/science/2004/sc2/>
- **Fluidized-Bed Combustion of Silane**
<http://www.psc.edu/publicinfo/netl/>
- **Lean-Fuel Mixes in Next-Generation Power-Generating Turbines**
http://www.psc.edu/science/Richards/clean_power.html
- **A New Design for a Power-Generating Turbine**
<http://www.psc.edu/science/cizmas2002.html>

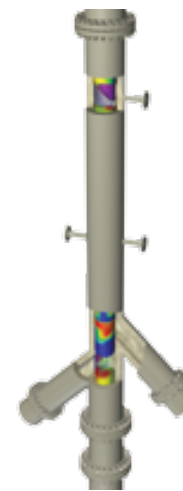


(SC)² PARTNERS

National Energy Technology Laboratory
Pittsburgh Supercomputing Center
Carnegie Mellon University
Duquesne University
University of Pittsburgh
Waynesburg University
West Virginia University
Institute for Scientific Research
NASA Independent Verification & Validation Facility
The West Virginia Governor's Office of Technology
MORE INFORMATION: <http://www.sc-2.psc.edu>



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Lynn Layman, PSC & Bob Romanowsky, NETL
(SC)² co-chairs



TRANSPORT GASIFICATION: CLEAN ENERGY FROM COAL

Among the projects (SC)² has made possible is an extensive series of simulations of a coal-gasification technology known as a "transport gasifier" (see pp. 22-25). This work, with NETL-developed software called MFIX (Multiphase Flow with Interphase Exchanges) and PSC's LeMieux and BigBen systems,

was instrumental in scaling up the transport gasifier for a 285-megawatt power plant now under construction near Orlando, Florida. When completed, scheduled for 2010, this plant will be the cleanest, most efficient coal-fired power plant in the world.

OVERVIEW: ENERGY SOURCES AND CONSUMPTION

Retired NETL scientist Gerst Gibbon addressed the (SC)² December 2006 meeting on the topic of fossil fuel's centrality in the global and U.S. economy. In a comprehensive presentation, Gibbon, who holds a Ph.D. in chemistry from Carnegie Mellon University, discussed pros and cons of many energy sources, including ethanol, nuclear power, hydrogen and wind. The world's economies, he noted, are largely committed to petroleum and natural gas as their primary fuel sources. World reserves of these fuels are likely to be exhausted this century, which will cause significant economic disruptions in most developed countries.



Pennsylvania Representative **Bill DeWeese** (Democrat), Fayette County (part), Greene County; **Ralph Sommers**, chair, Greene County Industrial Development Corp.; **Rebecca Bagley**, Pennsylvania Department of Community and Economic Development; **Tim Thyreen**, president, Waynesburg University.



KEYSTONE INNOVATION ZONE

Through (SC)², PSC this year helped to prepare a successful grant application from Waynesburg University, the Greene County Industrial Development Authority and others for Pennsylvania's Keystone Innovation Zone (KIZ) program. Funding of \$200,000 from the Ben Franklin Technology Development Authority of Pennsylvania Department of Community and Economic Development will spur new technology and economic development in Greene County. Lynn Layman of PSC, co-chair of (SC)², serves on the Waynesburg KIZ advisory board.

WAYNESBURG UNIVERSITY LINKS TO INTERNET2

Through its 3ROX high-performance network hub, PSC's networking group this year provided Internet2 connectivity for (SC)² member Waynesburg University. This advanced infrastructure opens new opportunities for research and education at Waynesburg. On May 15, PSC staff visited Waynesburg for a daylong event introducing the campus community to possibilities opened up by the Internet2 connection. A wide range of Waynesburg faculty and staff attended.

