



NEWS RELEASE

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By line:

Research Team Receives Green Innovation Award

The Department of Defense (DoD) High Performance Computing Modernization Program (HPCMP) was recently recognized by the U.S. Army chief of engineers in the Awards of Excellence program for excellence in sustainability, design and construction. A team comprised of representatives from the HPCMP's five DOD Supercomputing Resource Centers (DSRCs) was awarded the U.S. Army Corps of Engineers (USACE) Green Innovation Award for "recognizing an innovation or idea with clear potential to transform the federal community's overall energy and environmental performance." The award is presented to an individual or team for the development and execution of a novel product, project, program, design or revolutionary idea that promotes sustainability in the federal government in an area relevant to the USACE mission. The DSRCs created an interagency community of practice (COP) team, the Green Team, that meets monthly to share best practices in supercomputing facilities operation and to plan energy awareness initiatives.

The Green Team is comprised of supercomputing facility experts from the five DSRCs operated by the Army, Navy and Air Force. These supercomputing centers house some of the most powerful computers in the world and consume a significant amount of electrical power. The team has proposed numerous changes to the centers, consistent with best practices. As these practices have been implemented, each center has seen a marked increase in efficiency and cost savings.

Energy consumption at each of the DSRCs varies between two and five megawatts per hour. With power consumption currently planned to grow at a rate of 36 percent over the next five

years, finding a sustainable growth path represents one of the most critical challenges facing large-scale supercomputing in DOD over the next 20 years. Managing this usage has become a major challenge. To remain competitive in this technology area, DOD must achieve sustainable growth in supercomputing and its related energy requirements.

The Green Team, currently led by the DSRC at the U.S. Army Engineer Research and Development Center (ERDC), has experience in developing energy conservation measures such as flywheel energy storage devices, uninterruptable power supplies and step-down transformers. By implementing such measures between 2008 and 2010, the ERDC DSRC improved its overall power usage effectiveness rating from 2.0 to 1.4 and is on a path to rating under 1.3 during fiscal year 2013. Other members of the HPCMP community of practice include DSRCs at the Army Research Laboratory at Aberdeen Proving Ground, the Navy Supercomputing Center at Stennis Space Center, the Air Force Research Laboratory at Wright Patterson Air Force Base and the Air Force Maui Optical and Supercomputing observatory on the island of Maui, Hawaii. Each DSRC faces similar challenges to its operating budget, although a somewhat different set of environmental and economic constraints on energy consumption. The DSRC at Maui, for example, faces some of the highest commercial power rates in the nation, but has abundant potential for the use of renewable energy sources.

One of the best practices recommended by the COP is the use of magnetic-levitation chiller compressors with economizers. This upgrade demonstrates a designed savings of approximately 30 percent on mechanical power consumption. At three of the five DSRC's, Green Team recommended savings efforts will be seen in the near future, as waterside economizers are installed this year. This change will reduce the energy used to mechanically produce chilled water while using the ambient air conditions to deliver free cooling inside the facility. The team is focused on potential energy savings in the area of direct current power instead of alternating current utility power for supercomputers, coupled with improved energy recovery methods. Other planned efforts include automated controls that will dynamically adjust water flow and chilled water temperature based on ambient conditions at the DSRCs.

With the formation of the "Green Team", the DSRCs have emerged as a cooperative COP that is sharing lessons learned in order to face common problems in support of a common DOD mission. The Green Team approach channels otherwise competitive tendencies between services into coordinated plans and recommendations. The challenge is to continue the drive toward technological leadership, recognizing that the energy budget will be increasing while the

fiscal budget will not. The approach can be repeated elsewhere in the federal government where similar common problems and missions unite otherwise separate and distinct agency programs. The Green Team has worked to share technical information, vendor expertise and lessons learned.

Greg Rottman, ERDC DSRC, leads a team which works closely with vendors to ensure recommendations are achievable. Rottman accepted the award for the Green Team at the USACE Senior Leaders Conference in July in Little Rock, Ark. The team has also been requested by the chief of engineers to submit their nomination to the GreenGov Presidential Awards program through the Office of the Assistant Secretary of the Army for Civil Works.

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About the DOD High Performance Computing Modernization Program (HPCMP)

The HPCMP provides the Department of Defense supercomputing capabilities, high-speed network communications and computational science expertise that enable DOD scientists and engineers to conduct a wide-range of focused research, development and test activities. This partnership puts advanced technology in the hands of US forces more quickly, less expensively, and with greater certainty of success. Today, the HPCMP provides a complete advanced computing environment for the DOD that includes unique expertise in software development and system design, powerful high performance computing systems, and a premier wide-area research network. The HPCMP is managed on behalf of the Department of Defense by the US Army Engineer Research and Development Center.

For more information, please visit our website at: www.hpc.mil.

