Southern Illinois University Carbondale OpenSIUC

2006

Conference Proceedings

7-20-2006

Innovations for Thermoelectric Cooling Technologies: Potential Benefits to the Energy-Water Nexus

John R. Gasper Argonne National Laboratory

Follow this and additional works at: http://opensiuc.lib.siu.edu/ucowrconfs_2006 Abstracts of presentations given on Thursday, 20 July 2006, in session 28 of the UCOWR Conference.

Recommended Citation

Gasper, John R., "Innovations for Thermoelectric Cooling Technologies: Potential Benefits to the Energy-Water Nexus" (2006). 2006. Paper 12. http://opensiuc.lib.siu.edu/ucowrconfs_2006/12

This Article is brought to you for free and open access by the Conference Proceedings at OpenSIUC. It has been accepted for inclusion in 2006 by an authorized administrator of OpenSIUC. For more information, please contact opensiuc@lib.siu.edu.

INNOVATIONS FOR THERMOELECTRIC COOLING TECHNOLOGIES: POTENTIAL BENEFITS TO THE ENERGY-WATER NEXUS

John R. Gasper, Argonne National Laboratory, jgasper@anl.gov Argonne National Laboratory, Suite 6000, 955 L'Enfant Plaza, Washington DC 20024, 202-488-2420, 202-488-2413

This paper is being submitted as part of a panel proposed by Michael Sale on the topic of Science and Technology Innovations for the Energy-Water Nexus.

Thermoelectric power generation currently accounts for 40% of all fresh water withdrawals in the U.S. - the same as is withdrawn for irrigation – and for approximately the same amount of fresh water consumed as the industrial/mining sector. Future consumption may significantly increase due to regulatory-induced shifts to closed cycle cooling. Most of this water is used to manage waste heat. Water availability currently limits the siting of facilities and the generation of electricity throughout the U.S. Meanwhile, demand for electricity is projected to increase by 53 percent from 2003 to 2030.

The conflicts that result at this nexus of energy and water create opportunities for R&D and technology innovation in the use and management of heat during thermoelectric generation. This paper will examine the opportunities to reduce cooling water demand, utilize waste heat, access alternative water supplies, regenerate process and cooling water and implement alternative environmental technologies during thermoelectric power generation

Argonne National Laboratory is managed by the University of Chicago for the U.S. Department of Energy under Contract Number W-31-109-Eng-38.

Contact: John R. Gasper, Argonne National Laboratory, jgasper@anl.gov Argonne National Laboratory, Suite 6000, 955 L'Enfant Plaza, Washington DC 20024, 202-488-2420, 202-488-2413