



National Science Foundation  
4201 Wilson Boulevard  
Arlington, Virginia 22230

NSF 13-095

## Dear Colleague Letter: NSF/EPRI Collaboration "Water for Energy" Solicitation on Advanced Dry Cooling for Power Plants

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Date: May 22, 2013

The purpose of this DCL is to draw your attention to an opportunity for research, technology development and education directed at reducing the use of water in power generation.

The Directorate of Engineering at the National Science Foundation (NSF) and the Electric Power Research Institute (EPRI) have established a collaboration to jointly address the critical problem of water usage and consumption in power plant cooling. The "water-for-energy" issue is an important piece of the Energy-Water nexus. The goal of this collaboration is to leverage the complementary missions of applied research and commercialization (EPRI) and fundamental research and education (NSF) to foster enabling research and technology development that will lead to significant reductions or elimination of the use of water for cooling power plants. Through this joint collaboration, NSF and EPRI jointly solicit proposals with transformative ideas that meet the detailed requirements in this solicitation ([NSF 13-564](#)).

In the U.S. power generation industry, steam-electric plants account for approximately 40% of the nation's total freshwater withdrawals and approximately 3% of the nation's total freshwater consumption. Power plants rely on condensers that use either once-through cooling, recirculating wet-cooling towers, or air-cooling to condense the steam discharge from the turbine. A potential approach toward eliminating or dramatically reducing water use in steam condensation is to use air-cooled steam condensers or to use hybrid technologies. Air-cooled condensers (ACC) used in practice typically have a steam-header feeding a large number of gravity driven finned-tubes for the condensate that drain into water pipes at the bottom. Large fans are used to circulate air past the finned-condenser tubes.

Innovations in air-cooled condensers, hybrid-cooling and alternative dry cooling technologies are needed to reduce penalties, size and capital costs. These innovations must be accompanied by fundamental studies and improvements in our understanding. We seek innovative, "out of the box", and game changing early stage dry cooling ideas and concepts to dramatically reduce the steam condensation temperatures of the currently used air cooled condensers and develop more efficient, cost effective, and compact alternative dry cooling solutions for power plant steam condensation. Lead investigators must be from academic institutions in the U.S; industrial collaborations are encouraged. It is anticipated that **\$6 million** total from the two agencies will be allocated for this three year effort, with individual awards anticipated to be in the **\$200,000-\$700,000 range** with an average award size of **\$300K/year**. For additional details please refer to [NSF 13-564](#). Proposals are due by 5 pm proposer's local time on **August 19, 2013**

Additional References: <http://www.epri.com/abstracts/pages/productabstract.aspx?ProductID=000000000001025771&Mode=download>

[http://mydocs.epri.com/docs/publicmeetingmaterials/11-26-2012/for%20NSF\\_2012%20NSF-EPRI%20Workshop%20Presentations\\_new%20section.pdf](http://mydocs.epri.com/docs/publicmeetingmaterials/11-26-2012/for%20NSF_2012%20NSF-EPRI%20Workshop%20Presentations_new%20section.pdf)

[http://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=13367&org=CBET&from=home](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13367&org=CBET&from=home)

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