APS March Meeting 2011
Dallas, Texas
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Tuesday, March 22, 2011 8:00AM - 11:00AM –

Session H5 FIAP GERA DNP: Drowning in Carbon: The Imperative of Nuclear Power  Ballroom C1


8:36AM H5.00002 What happened to the US nuclear renaissance?  ROBERT ROSNER, The University of Chicago — While nuclear power generation is seeing a distinct revival internationally, especially in Asia, a corresponding revival within the United States has not yet occurred. I will discuss the various reasons for this difference, as well as the consequences - some distinctly unintended - for the future U.S. role in the spread of nuclear power generation as well as in non-proliferation internationally.

9:12AM H5.00003 Used Nuclear Fuel: From Liability to Benefit  RAYMOND L. ORBACH, The University of Texas at Austin — Nuclear power has proven safe and reliable, with operating efficiencies in the U.S. exceeding 90%. It provides a carbon-free source of electricity (with about a 10% penalty arising from CO$_2$ released from construction and the fuel cycle). However, used fuel from nuclear reactors is highly toxic and presents a challenge for permanent disposal – both from technical and policy perspectives. The half-life of the “bad actors” is relatively short (of the order of decades) while the very long lived isotopes are relatively benign. At present, spent fuel is stored on-site in cooling ponds. Once the used fuel pools are full, the fuel is moved to dry cask storage on-site. Though the local storage is capable of handling used fuel safely and securely for many decades, the law requires DOE to assume responsibility for the used fuel and remove it from reactor sites. The nuclear industry pays a tithe to support sequestration of used fuel (but not research). However, there is currently no national policy in place to deal with the permanent disposal of nuclear fuel. This administration is opposed to underground storage at Yucca Mountain. There is no national policy for interim storage—removal of spent fuel from reactor sites and storage at a central location. And there is no national policy for liberating the energy contained in used fuel through recycling (separating out the fissionable components for subsequent use as nuclear fuel). A “Blue Ribbon Commission” has been formed to consider alternatives, but will not report until 2012. This paper will examine alternatives for used fuel disposition, their drawbacks (e.g. proliferation issues arising from recycling), and their benefits. For recycle options to emerge as a viable technology, research is required to develop cost effective methods for treating used nuclear fuel, with attention to policy as well as technical issues.

9:48AM H5.00004 Fuel Cycle R&D Requirements for Future Nuclear Power  LEE SCHROEDER, Lawrence Berkeley National Lab and TechSource — Recently, DOE Nuclear Energy completed its Road Map for a science-based approach to future nuclear energy development. Fuel cycle R&D is a central element of the Road Map, which covers nuclear energy through the period 2040-2050 and perhaps beyond. Examples of fuel cycle R&D activities will be presented, along with an outline of the types of research facilities needed to support this effort. Experimental facilities within several areas of the DOE, including DOE’s Office of Nuclear Energy and its Office of Science, will be required for this task. In addition, advanced modeling and simulation will play a growing major role in these activities.

10:24AM H5.00005 Roundtable Discussion and Q&A —