SESSION 9A

THE SHAPE OF THINGS TO COME: GLOBAL WARMING, GREEN HOUSE GAS EMISSIONS, AND OTHER ENVIRONMENTAL BENEFITS

Moderator: Jim Mapp, Dark Energy Associates

PAPERS:

350/650/1050 – Implications of Global Warming for Demand-Side Management
H. Gil Peach, Scan America
John Mitchell, Jai J Mitchell Analytics

Documenting Greenhouse Gas Emission Reductions From End-Use Efficiency Activities in the Kyoto Protocol's Clean Development Mechanism Offset Program
Steven R. Schiller, Schiller Consulting, Inc., Piedmont, CA

Into the Breach with Carbon: Recent Approaches for Realizing Environmental Benefits of Displaced Generation Emissions
David Sumi, The Cadmus Group, Inc., Madison, WI
Eric Rambo, The Cadmus Group, Inc., Madison, WI

SESSION SUMMARY:

This session describes many trends impacting the goals to limit Global Warming. These trends include energy efficiency funding, clean development mechanisms, and hourly emission factors.

The first paper provides some background on the magnitude of global warming, its effects on the environment and the need to do more to limit future increases in Greenhouse Gases. The paper offers a view of how Demand Side Management (DSM) will have to change as the greenhouse gas content of the atmosphere increases. First the paper looks at climate change from a technical perspective including the history of greenhouse gas emissions and atmospheric concentrations of carbon dioxide and methane, residence lifetimes of various greenhouse gases and forecast future changes in weather patterns. The paper next looks at barriers that make individual and societal response to climate change difficult. These include valuing inappropriate conventions of economic theory and finance over the need to implement immediate mitigation strategies, limiting of economic resources and the promotion of doubt concerning global warming. Finally the paper provides the outline of an approach that begins with current DSM and moves toward total social mobilization. This approach includes greatly strengthened building codes, near zero energy buildings, smart grid and smart meters and cost optimality project selection criteria.

The second paper provides documentation of Greenhouse Gas Emissions Reductions in the Kyoto Protocol's Clean Development Mechanism (CDM) Offset Program. The paper describes how the world's largest greenhouse gas emissions offset program calculates avoided emissions from end-use energy efficiency measures. The paper describes the CDM, basic issues associated with calculating avoided emissions from efficiency activities, and CDM baseline and monitoring methodologies for efficiency activities. The paper begins providing some background on the development of the CDM under the 1992 United Nations Conference on Environment and Development in Rio de Janeiro. The CDM is one of three market-based "flexible mechanisms" designed to reduce the cost of meeting GHG emissions reduction commitments. The paper describes how the CDM is implemented through various

projects. Then the paper reviews the status of the CDM and energy efficiency after 2012 into the "second commitment period" (2013-2020). There is a discussion of issues associated with calculating avoided emissions for efficiency activities including direct and indirect emissions, primary and secondary effects and leakage and interactive effects. Many other issues are discussed such as suppressed demand due to poverty or lack of energy infrastructure, "rebound" and the Jevons Paradox, additionality of emissions reduction that would have occurred absent a climate program and "emissions assessment boundary" or physical location of each measure. Finally, several specific examples of energy efficiency activities are included to illustrate the CDM methodology and its application.

The final paper discusses recent approaches for realizing environmental benefits of displaced generation emissions. Displaced generation emission is used in place of avoided because of the difficulty of verifying that energy efficiency programs reduce power generation and that their associated emissions have been avoided. The paper describes the movement from the evaluation of energy efficiency programs from documenting and measuring energy savings to other environmental impacts including greenhouse gas emissions reduction. The long term goal of monetized emissions reduction provides a motivation for the development of a broadly accepted accounting standard for quantifying GHG emissions. This paper describes the development of a method for estimating hourly displaced emissions using the Environmental Protection Agency's "Acid Rain Hourly Emissions" data series and guided by the protocol of the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCCSD). The methodology yields hour by hour marginal emissions factors. The paper provides a comparison of the hourly marginal emissions factors with the annual average hourly emission factors for various pollutants in terms of Lbs/MWh. These hourly emissions factors can be utilized along with hourly savings load curves due to various specific energy efficiency measures. The authors refer to this approach as Time of Savings (TOS) emissions factors. The technique can also be applied to the increased use of renewable energy. The paper concludes with a discussion of the "Value of Estimating Displaced Emissions in the Current Political Climate".