Real-time Energy and Climate Simulations: Tools for Understanding and Creating a Secure Future

Presenter:
Andrew P. Jones, Climate Interactive, Co-Director, 8 Lynmar Ave., Asheville NC 28804, apjones@climateinteractive.org

Presentation Abstract:

Under the United Nations Framework Convention on Climate Change (UNFCCC) the nations of the world have pledged to limit warming to no more than 2°C above preindustrial levels. However, negotiators, businesspeople, the public, and policymakers lack the capability to assess the impact of greenhouse gas (GHG) emissions reduction proposals offered by the parties on warming and the climate. The climate is a complex dynamical system driven by multiple feedback processes, accumulations, time delays and nonlinearities, but research shows poor understanding of these processes is widespread, even among highly educated people with strong technical backgrounds. Existing climate models are opaque to policymakers and too slow to be effective either in the fast-paced context of policymaking or as learning environments to help improve people’s understanding of climate dynamics. In our event we present C-ROADS (Climate-Rapid Overview And Decision Support) and its associated energy model En-ROADS, transparent, intuitive policy simulation models that provide policymakers, negotiators, educators, businesses, the media, and the public with the ability to explore, for themselves, the likely consequences of GHG emissions policies. The simulations run on an ordinary laptop in .1 seconds, offer an intuitive interface and have been carefully grounded in the best available science. We describe the need for such tools, the structure of the models, and calibration to climate data and state of the art general circulation models. We also describe how C-ROADS is being used by officials and policymakers in key UNFCCC parties, including the United States, China and the United Nations, as well as in a role-playing “serious game” World Climate, in an iPhone/iPad app, and in other online tools created by our team and others through open-source sharing. All simulations and media are freely available at climateinteractive.org.
Two journal articles are currently under review on this work, one (on the model) at “Climatic Change” and the other (on the serious game) at “Simulation and Gaming.” Both are available as working papers at:

http://jsterman.scripts.mit.edu/Working_Papers.html