



Harvard Kennedy School Energy Policy Seminar Series, Fall 2014

Climate Realism

Monday, September 15, 2014

By Louisa Lund, Program Director, Consortium for Energy Policy Research

“We need much more realistic thinking on climate,” Clean Air Task Force Executive Director Armond Cohen said in his talk in the Harvard Kennedy School’s Energy Policy Seminar on Monday, September 15. Such realism begins with an appreciation of how big the problem is, Cohen explained. Current climate goals suggest the need to reduce net carbon emissions to zero by 2050, at the same time as significant global economic growth is projected to increase the demand for energy by two to three times current levels (even after fairly ambitious energy efficiency targets are included in the projections)—a huge challenge in a world in which energy transitions historically take fifty to one hundred years.

In this context, Cohen examined the potential of renewable energy to meet future energy needs, arguing that, while renewables are likely to be an important part of a low-carbon energy system, it is important to understand their limits.

In particular, Cohen noted that solar and wind energy plants have relatively low capacity factors (energy actually produced compared to peak energy production capability). That is, you need to plan for renewable plants to produce variable amounts of energy, depending on how much sun or wind they are getting at any given time. Unfortunately, this means that renewable energy requires backup by a “shadow system” capable of taking over when renewables are not producing—a situation that Cohen noted is illustrated in the case of Germany, whose installed capacity must now be significantly greater than its actual energy usage, in order to compensate for the growing dependence on variable renewable sources of energy. The need for such a shadow backup energy system increases the expense and land use requirements of renewable energy—and if the shadow system involves fossil fuels, it increases related carbon emissions, as well. Looking at these limitations, Cohen argued that it will be hard to get more than 25%-50% of electricity from renewables, even in a best-case scenario.



So what could fill the gap? Probably not isolated microgrids (except for early stage energy in developing nation villages) or bio energy (due to the carbon impacts of energy cropping). “We need a diverse strategy,” Cohen said, suggesting that both nuclear energy and carbon capture and storage are likely to be necessary parts of a 2050 energy system—nuclear energy because of its potential to be built quickly at large scale (with zero carbon emissions); and carbon capture and storage as a way of addressing the likely persistence of current and future installed fossil fuel electrical capacity and the need for zero carbon liquid fuels. Cohen also stressed the need for rapid innovation on all technologies to bring down cost and improve performance.

Cohen spoke as part of the Kennedy School’s Energy Policy Seminar Series, which is jointly sponsored by the Energy Technology Innovation Policy research group of the Belfer Center and by the Consortium for Energy Policy Research of the Mossavar-Rahmani Center on Business and Government.