Legislative Interests Panel Discussion

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Natural disasters occur where extreme forces of nature converge with vulnerable people, infrastructure, and networks. But the degree of vulnerability of an interconnected network can change spatially and temporally, depending in part on the demands placed on the system and on the intersection of natural hazards with the network's weak points over space and time. The electric power grid is one such example. One projected outcome of the current restructuring of the national electrical power network is increased efficiency within the system as available sources of electrical power are used more productively, i.e. less idle time. The presumption is that redundancy and spare capacity will be minimized.

Another presumption is that a restructured electric power system will be optimized over time as supply and demand are brought into dynamic balance within the more efficient system, the recent California experience notwithstanding. In a restructured network, will the system also be optimized to account for natural hazards? The California experience may be instructive in this regard, even though the power shortages are not connected in the public's mind with the vagaries of nature as they are connected with the vagaries of human behavior. Drought has lowered reservoir levels in the northwest and threatens supplies of needed hydropower in California. The impact of drought is an overprint on a system stressed by other factors. In the longer-term, will leaner excess capacity expose vulnerabilities to weather and climate forecasts that have inherent uncertainty? Are the uncertainties in projected temperature trends by meteorologists, for example, captured in the allocation of excess capacity in the power grid?

With restructuring and more competition, one presumes that maintaining the electrical grid will become more efficient and less redundant in order to lower costs. Will managers of these systems take into account the vulnerabilities to natural hazards that tend to propagate along an interconnected system? Uncertainties in the projected strength and impact of landfalling hurricanes, or severe winter storms, may be important numbers to capture in the planning for needed maintenance and repair within a power system facing natural hazards.

In a more general sense, the current scientific understanding of natural extreme events, and the uncertainty in projecting the impacts to the electrical power system, should not be excluded from the electricity restructuring planning and debate. In asking the question of just how much redundancy and resilience to build into the electrical power network, the full costs of conceivable losses attributable to natural hazards should be accounted for, not just structural losses themselves. The structural integrity of the system may withstand a flood, earthquake, or hurricane, but work stoppage, communication interruption, and other consequences may have broad economic impact. As Congress and the Administration grapple with setting energy policy for the nation, building in resilience to natural hazards should be woven through the overall energy strategy.