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**Abstract Title:** Electricity Impacts of Coordinated, Purposeful Behavior  

**Abstract Text:**  
There is increasing concern about the grid impacts caused by fluctuations in electricity generated by wind and PV; however, there also exist fluctuations on the demand-side caused by coordinated, purposeful behavior (CPB). Some of these behaviors are entirely predictable but others are exceptional in some way and illustrate the potential impacts. Three instances of CPB that caused large, but brief, impacts on grid-wide demand are:  

- Lunchtimes in Japan and other east Asian countries  
- Earth hour  
- World Cup football championship games  

Japanese and Korean work schedules are so homogeneous that demand falls 6 GW for exactly one hour. We investigated the behaviors in the commercial sector that lead to such a large, daily drop. Each worker in the commercial sector switches off an average of 50 watts of lights and equipment during lunch time. These habits have been encouraged by traditions as well as government exhortations. Each year, regions around the world participate in Earth Hour by switching off lights and other energy-using equipment. We compiled observed savings from over 200 regions where electricity impacts were evaluated and found average grid-level reductions of 4%, but ranging from -2% to 28% for Earth Hour. The World Cup football championship is possibly the largest CPB but its impact on various grids was barely detectable except in countries with homogeneous populations and when the games occurred at unusual times. CPB could be (and has been) used to counteract unexpected short-term reductions in electricity supplies.