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Abstract

Title: The contribution of Energy Flexibility for a more resilient and sustainable power grid

The world is experiencing the highest penetration of renewable energy but, at the same time, there is an increasing electrification of the energy demand along with a more frequent occurrence of extreme weather events. These changes pose new challenges in terms of electrical systems management and planning. On the end user side, the drastic variations in loads over the course of a day or the increased use of energy in the so-called peak periods poses more complex control problems requiring faster decision times and smaller error margins. On the other hand, the electrical power grid is a critical infrastructure, that underpins modern society, particularly vulnerable to extreme weather events. Disruptions due to extreme weather events can lead to power outages that can last for days or even weeks, affecting hospitals, communication networks, water and sanitation systems, and essential services. Energy flexibility is being regarded as a valuable tool towards a more sustainable electrical system. This tool combined with new paradigms, such as the establishment and operation of energy communities, will provide resilience, flexibility, interconnectivity, bi-directionality and complementarity with advantages either to consumers either to the electrical power grid itself. This talk will address the use of energy flexibility as a tool to achieve a more resilient and sustainable electrical system.