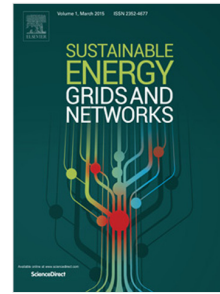


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Opportunities for Consumer-Driven Load Shifting in Commercial and Industrial Buildings

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Abstract

Commercial and industrial buildings are typically billed for both electricity consumption and peak 15-minute demand. While this rate structure does not motivate consumers to lower the grid peak demand, it does provide strong motivation for shifting load away from the *site* peak. However, the economic viability of site peak reduction depends greatly on typical building operations and will vary widely from one building to the next. This paper quantifies the potential that various building types have for site peak reduction using a database of 15-minute demand for buildings in Texas. The primary contribution of this paper is the identification of building types that stand to gain the most by exploiting 15-minute peak demand charges. The influence that site peak demand reduction has on the overall grid is also analyzed. This analysis of site peak reduction in buildings leads to several interesting conclusions. For example, site peak reduction is generally most difficult at industrial and healthcare buildings. On the other hand, grade schools (K-12) and hotels may reduce the site peak with relatively little effort. However, even widespread site peak reduction will only have a minimal effect on the overall grid peak. While buildings may obtain cost savings by reducing these transmission and distribution costs, utilities should consider modifying the retail rate structure in order to provide a direct motivation for consumers to reduce wholesale electricity prices.

INTRODUCTION

Background

Demand Response (DR) is an essential element of grid demand management and continues to be an active area of research. Much of the DR research explores various incentive-based or price-based programs designed to leverage demand side resources during period of high grid demand. Rate structures that could motivate consumer-driven load shifting (such as time of use pricing) have made some impact in the residential sector

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