

COMMERCIAL BUILDING COGENERATION OPPORTUNITIES

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ABSTRACT

Many industries have begun to recognize that the projected efficiency gains resulting from the sequential production of heat and power by cogeneration equipment can be translated into financial rewards by capital investments in this equipment. These individual investment decisions, moreover, have been the object of Federal policies designed to encourage the use of these technologies since the co-generation of these energy forms can conserve scarce natural resources. Whether the commercial sector will be successful in contributing to this national goal is complicated by many factors.

The technical and economic characteristics of a successful cogeneration system can be easily outlined; analysis of the opportunities for such systems in commercial buildings, however, is complicated by the number of interdependent trade-offs that must be made in any given application. One general statement of the problem is that an understanding of the net impact of the trade-offs requires an engineering/economic analysis that can capture the dynamic relationships between the thermal and electrical requirements of commercial buildings, the operating characteristics of the cogeneration equipment, and the utility interface to this operation.

The DOE-2.1 building energy analysis tool is used to analyze the returns to cogeneration systems for two building types located in five US cities. For these systems, the effects of system sizing and operating strategies are examined using actual rate schedules. We conclude that cogeneration is best thought of as fuel-switching strategy and that, in this context, the driving force for cogeneration opportunities in commercial buildings is the levels and relative prices of the fuel and the electricity that are being substituted.

* The work described in this report was funded by the Assistant Secretary for Conservation and Renewable Energy, Office of Building Energy Research and Development, Buildings Systems Division of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.