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Energy consumption and temperature correlations for 4 Greek Ionian Sea islands

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Energy consumption, especially for space heating and cooling, is linked to several weather variables, mainly air temperature. This study investigates the relationship between residential energy consumption load demand and daily mean air temperature for 4 Greek islands in the Ionian Sea for the period 2005-2011.These islands are Zante, Cephallonia, Corfu and Lefkada and were selected due to their data availability as they are interconnected to the mainland power distribution system.

We present the time series of diurnal, daily, monthly and yearly variations of energy consumption for each of the selected sites and subsequently identify correlations with mean daily air temperature. Several effects such as weekly and holiday effects, unrelated to weather conditions, can be detected. Daily and monthly seasonal effects have been studied separately to isolate the weather influence on energy consumption. The most important finding, however, is the outstanding increase in consumption during the tourism season. Depending on the island, increased levels of consumption are present for 4,5 or more months per year, related to tourists arrivals on the island. This effect combined with energy consumption peaks on the hot days of the year should be taken into account during energy conservation planning.