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1. Introduction

1.1. Ground source heat pump

A survey of US Department of Energy (USDOE) for energy consumption levels showed that buildings in the US accounted for about 41% of total energy consumption in 2010, and this amount was 44% more than the transportation sector and 34% more than the industrial sector (USDOE, 2015). Amongst these, commercial buildings were covering about 46% of

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