Cement industry is one of the most energy consuming sectors in the world. Through a cement plant, rotary kiln is the most energy intensive section that consumes the highest portion of the total energy, so it is getting very substantial to perform energy and exergy analyses for determining possible energy-saving options. In this study, thermodynamic assessment of the rotary kiln unit of a cement plant is carried. For the analysis, mass, energy and exergy balances of the rotary kiln are constituted and using actual plant data the performances of the rotary kiln are identified. The rotary kiln clinker capacity is 79 tons per hour. The energy and exergy efficiency of the unit is found to be 68% and 58.6%, respectively. At the end of the study, the results are compared with the other studies concerning with the same matter of different plants and available heat recovery possibilities are discussed.