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PERFORMANCE INVESTIGATION OF GEOTHERMAL DISTRICT HEATING SYSTEMS

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ABSTRACT In this study, we investigate the Dikili geothermal district heating system (GDHS) in Izmir, Turkey. The system mainly consists of three cycles, namely (i) the transportation network, (ii) the Danistay region, and (iii) the Bariskent region. While the Bariskent region contains 1100 residences equivalence, the Danistay region is 2900 residences equivalence.

The system is simulated using the PipeLab software to define problematic points first while some problems have been found out according to velocity and pressure drops in the Bariskent and Danistay regions. Next, the problems have been solved by revising diameters of the lines. The system is then investigated from the view point of sustainability. Finally, sustainability index (SI) values are considered as an environmental indicator and examined for main components of the system. The value is calculated to be 2.057 for the Dikili GDHS with an exegy efficiency value of 51.4%.

Keywords: Geothermal energy, Energy, Exergy, Simulation, Sustainability.