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Techno-economic analysis of a solar thermal retrofit for an air-cooled geothermal Organic Rankine Cycle power plant

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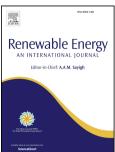
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ACCEPTED MANUSCRIPT

1	Techno-economic analysis of a solar thermal retrofit for an air-cooled
2	geothermal Organic Rankine Cycle power plant
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11	
12	Abstract
13	High ambient temperatures are often coupled with high levels of solar irradiation
14	and lead to a significant reduction of the power output of air-cooled geothermal Or-
15	ganic Rankine Cycle (ORC) power plants. Consequently, hybridisation based on
16	solar thermal power is promising. In this work, a solar thermal retrofit based on su-
17	perheating of the ORC working fluid is analysed under technical and economic crite-
18	ria considering typical conditions in Turkey. The conducted off-design simulations
19	prove that the isentropic efficiency of the turbine has a major impact on the perfor-
20	
	mance of the entire system. The solar field size and the corresponding degree of su-

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stability of the examined ORC working fluid is sufficient and a low-temperature

parabolic trough field with water as heat transfer fluid can be realised. For the retro-

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