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EFFECT OF PROPERTIES OF WORKING FLUIDS ON THE EFFICIENCY OF A LOW-TEMPERATURE ORGANIC RANKINE CYCLE

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Abstract: Decarbonization of all segments of energy systems, both on the supply and demand side, is one of the main goals of the energy transition. Electricity supply in the future will largely rely on generation from intermittent energy sources: wind and solar. Locally available, non-utilized alternative low-temperature energy sources as hydro-geothermal wells, and abounded oil and gas wells, have the potential to provide continual energy production over the year. Electricity generation from these energy sources is carried out with working fluids with low evaporation temperatures. Commonly used fluids are categorized into several groups based on their chemical composition, which determines their thermophysical properties. In this paper the effect of chemical composition of six fluids from three groups on thermophysical properties was analyzed. The effect of fluids' properties on the efficiency of ORC is analyzed for the case of a typical range of temperatures of hydro-geothermal and abounded oil and gas wells in Serbia, which may be used as heat sources for electricity generation.

Keywords: Properties, Working fluids, Efficiency, ORC, Low temperature.

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