

Every year, flare gas is responsible for more than 350 million tons of CO₂ emissions. Aside from thermal and environmental pollution impacts, flare gas contributes to global warming and enormous economic losses. Thus, waste heat recovery due to flaring gas can be explored through Organic Rankine Cycle ORC systems for electricity production. In this context, the assessment of a toluene ORC system is proposed for a potential application in an Algerian petrochemical unit. The study focuses mainly on highlighting the potential and thermodynamic performances of the ORC application to produce electricity and potential cooling thanks to coupling an absorption chiller by recovering heat due to flaring gas. Such a solution can easily be implemented as an energy efficiency key solution. The ORC electrical production can meet the increasing demand of natural gas initially intended to be provided to a gas power plant and assures the major part of the Algerian electrical production