

Review of: "Technical and Financial Viability of a 1 MW CSP Power Plant with Organic Rankine Module: Case Study for a Northeastern Brazilian City"

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Potential competing interests: No potential competing interests to declare.

In this manuscript, a simulation was conducted for a 1 MWe parabolic trough concentrating solar power plant utilizing an Organic Rankine Cycle to generate power. Solar data from Fortaleza, the capital city of Ceará in the northeast region of Brazil, was employed for the simulation. The study covered the entire year and incorporated hourly data for accuracy. Various sizes of solar fields and thermal energy storage were evaluated. By the conclusion of the study, the technical and financial analyses led to the identification of the most optimal configuration among the considered alternatives. The following points have been raised:

1. The manuscript would benefit from improvements in its English language usage
2. The term "configurations" is inaccurately used throughout the manuscript and should be replaced with "different sizes" for clarity.
3. The literature review in the paper is currently underwhelming and requires enhancement with additional works in the field. Moreover, the introduction contains extraneous information that diminishes the scientific quality of the literature review. Streamlining the introduction and incorporating more relevant works will contribute to the overall robustness of the paper.
4. The novelties in the manuscript are weak and fall below standards. The simulation of a Concentrated Solar Power (CSP) plant in a specific site and the consideration of different sizes of solar fields may not be considered novel elements, as these approaches have been explored previously in the literature. It is advisable to identify and highlight more distinctive aspects or innovations in the study to elevate its contribution and originality.
5. Tables in the manuscript are inserted without proper mention or reference in the text by the authors. It's essential to address and cite each table in the relevant sections of the text to ensure clarity and coherence in presenting the information.
6. Including a schematic of the studied plant is imperative to elucidate the working principles of the installation and provide a clear visualization of each process within the system. This addition will enhance the reader's understanding of the described processes and contribute to the overall clarity of the manuscript.
7. The manuscript lacks a comprehensive presentation of the mathematical model for the Organic Rankine Cycle (ORC). Additionally, crucial information such as the working fluid, working temperatures and pressures, as well as the efficiencies of the utilized turbomachinery, is conspicuously absent from the description of the ORC. Moreover, the

assignment of a global efficiency of 23.8 at base load appears unusual and requires further justification or clarification.

8. Several crucial inputs for the solar field are conspicuously absent from the manuscript, including dimensions of the collector, receiver specifications such as working temperatures, pressures, and mass flow rates. Additionally, the rationale behind adding Tables 3-5, which represent coefficients of heat losses of the receiver with different fluids in the annulus, is unclear. It appears that the authors have drawn extensively from existing literature without demonstrating how these inputs and tables contribute to the scientific advancement of their paper.
9. The economic model in the manuscript is notably weak and rudimentary. One specific concern is the selection of the power block price at 1000 \$/kW for the ORC, which lacks justification or explanation (the referring reference justified by the authors is questionable).
10. The validation of the proposed model is entirely absent in the manuscript. It is essential to include a validation process to ensure the reliability and accuracy of the model's predictions.
11. The figures in the manuscript require improvement for better clarity and visual impact.
12. The discussion of the results appears to be superficial and would benefit from more in-depth analysis and insights. Consider providing a more thorough examination of the findings, discussing their implications, addressing any unexpected outcomes, and connecting the results to existing literature.