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

Nuria Novas[1]

1 Universidad de Almería

Potential competing interests: No potential competing interests to declare.

Comments to authors:

This paper deals with the simulation of several configurations of a 1 MWe parabolic trough concentrating solar power plant. The starting data are for Ceará (Brazil).

With the intention of improving the manuscript, the following considerations are proposed:

1.- The paper is well structured, but the novelty is not clear, in the literature there is a great variety of manuscripts describing simulations and implementations of similar systems, the difference is the location. Financial and energy efficiency issues have already been published. I think the novelty is poor without an implementation to support the simulated results. A simulation is a feasibility study and is no longer a novelty. It compares the production of solar thermal with CSP and biomass, a comparison similar to ref. 12, more comparisons should be made with the rest of the most widely used renewables in Brazil, this can help to improve innovation. Novelty cannot be based on location and population, but on a novel proposal itself. Studies of grid stability, the challenges of energy production, etc. are novel issues.

2.- The acronym OM is used in the summary and is not defined. It is recommended that all acronyms be defined the first time they are used in the text, regardless of their inclusion in the table of abbreviations. This applies to the entire manuscript.

3.-Introduction:

- reference 1 and accompanying text should be updated to the last two years.

- Update the data in Figure 1 to 2023 or at least 2022. In recent years there has been an exponential growth in all renewables due to global policies to increase renewable energy.

It is therefore important to show current data.

4.- In "2.2. The Solar Collectors Field", equation 1 is presented, define all parameters. This is applicable for the rest of the equations.

5.- Section 2.2 is subdivided into several sections to apply the different equations defining the collector system. Since all the equations have been defined in reference 17, it would be more attractive to present it as a summary table of the equations, so that readers would have a clearer view. I recommend a table where the title indicates ref 17 and the columns can be the objective of the equation, e.g. Incidence Angle Modifier (IAM) or Shading, etc., the equation, the parameters and their definition. Manuscripts should be not only novel, but also attractive to readers and therefore very visual. You can then comment on the equations or deviations of the parameters that you consider most interesting.

Economic Analysis" is divided into several sub-sections. I think that, like the previous section, it can be summarised in a table and explained as a single section.

6.- TES costs are based on data from references 4 and 25, both from 2017, more updated data should be sought. A design decision cannot be based on outdated economic data. Prices have evolved a lot in recent years.

7.- ORC Module Costs does not have updated data either, it uses 2018 data.

8.- Figure 2 should indicate the simulated day, the season of the year has an influence. It would be more illustrative to have the monthly averages distributed by hour to be able to draw valid conclusions and a comparison with energy consumption, to see whether or not it can meet the consumption targets necessary to stabilise the grid. The hours of greatest destabilisation of the grid due to renewables (solar and wind) should be indicated, as they have indicated that this is one of the issues that make the study necessary.

9.- Figures 3, 6 and 7 are not referenced in the text.

10.- The detailed values used in section 2 for the 5 configurations are not indicated in the results.

11.- Where is the comparison with the production of solar thermal with CSP and biomass indicated in the introduction?

12.- the conclusions cannot be a summary of the manuscript, but a means to highlight the most important issues of the manuscript, for this a good discussion is required where the new findings can be highlighted. This discussion is missing and therefore it is not possible to draw relevant conclusions.

13.- The references are not complete, nor are they formatted, many are missing the authors, some have doi and others do not. They should be revised, and the format proposed by the journal should be used.