

# 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.

## GENERAL COMMENTS

The paper presents technical and economic simulation of a stand-alone 1MW Organic Rankine Cycle (ORC) CSP with the local weather (Fortaleza) data for 5 different solar multiple (SM) values: 1.42, 2.13, 2.85, 3.56, 4.27 and with different thermal energy storage (TES) capacities. The technical and economic analysis presented is deep and commendable. However, I find the abstract to be handicapped in the sense that it does not really tell the motivation behind the work. Secondly, an attempt was made at presenting the novelty of the work in the introduction but it was not strong enough. It is also not certain whether the previous works that the findings of this work are being compared with have similar climates as Fortaleza. The grammar of the work must be improved greatly to make it more pleasant reading

## COMMENTS

Abstract: Last sentence should be rewritten. The grammar is confusing

Introduction:

1. The statement highlighted should be rewritten. The grammar is wrong: Although this technology has been the topic of studies for several years <sup>[6]</sup>, it still is a field presenting continuous developments, ***as investigated by <sup>[7]</sup> who analyses*** the present status and the development tendency of CSP, and being the focus of many recent researches which address many issues related to it.

2. The grammar in the statement highlighted should be worked on: <sup>[9]</sup> investigates the feasibility of CSP in Sub-Saharan Africa, and concludes, among other things, that the *financing conditions are the most important factor* to determine the CSP feasibility for that region

3. The following statement should be rewritten. The grammar needs to be improved: *In <sup>[10]</sup>, it was analysed the economic justification of CSP when taking into account not only the selling price of energy but also the flexibility provided to the system and the economical gain due to it in two provincial power systems with high renewable penetration, in northwestern China.*

4. The last part of the statement shown should be improved. Please, choose a better alternative to the word "superior":

Being near the Equator line, Brazil's northeastern region presents a good potential for CSP projects, with an average DNI reaching around 5500 Wh/m<sup>2</sup>. day and average annual temperatures superior to 24°C [12]

5. The following statement should be rewritten/improved grammatically: In order to do so, several configurations were considered, differing one from another in the solar field size and in the implementation or not of a TES and the amount of its storage capacity.

6. A comma should be introduced after the word “currently” in the following statement: Currently this region doesn't have a wide enough background to rely on or to draw the interest of such players.

7. The following statement should be rewritten: Section 3 as used to present the parameters considered for the economic analysis of the power plant and how the LCOE was calculated

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## System modelling

A comma should come after the word “subsections” in the following statement: In the next subsections the mathematical description of the different subsystems is described.

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## The solar collector's field

1. The last end of the following statement should be improved: For 2019, the equinox was on 23rd of September so the design point for the present paper will be considered that date at 10am

## Session 2.2.7

The statement “And the temperature and specific enthalpy as a function from one another are represented by equations 14 and 15” should be rewritten and put into perspective. The use prepositions should be done properly. It is also not proper to start a sentence with “And”

## Session 2.2.8

It is ok to say “equation (16)” instead of “the equation (16)”. This applies to all other parts of the text where the definite article was used improperly.

## Session 5

Punctuations should be used adequately in this sentence: Based on what was presented Figure 4 displays the effect of the TES capacity on the LCOE for the different solar field sized configurations

The statement highlighted should be rewritten, the grammar needs to be improved; *This points to the direction of showing the location as a good one for such a type of project, since it would demand less generation compensations from the system operator in the months with less generation.*