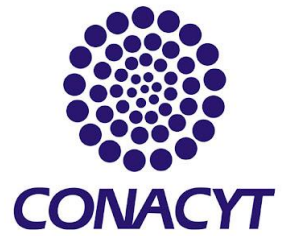




DO 2^{DO} COLOQUIO DE POSGRADOS IIT

11 Y 12 DE NOVIEMBRE 2021

Coordinación de Apoyo al Desarrollo de la
Investigación y el Posgrado
• IIT



4E (Energy, Exergy, Economic and Environmental) Analyzing of a combined solar thermal collector and photovoltaic CHP system

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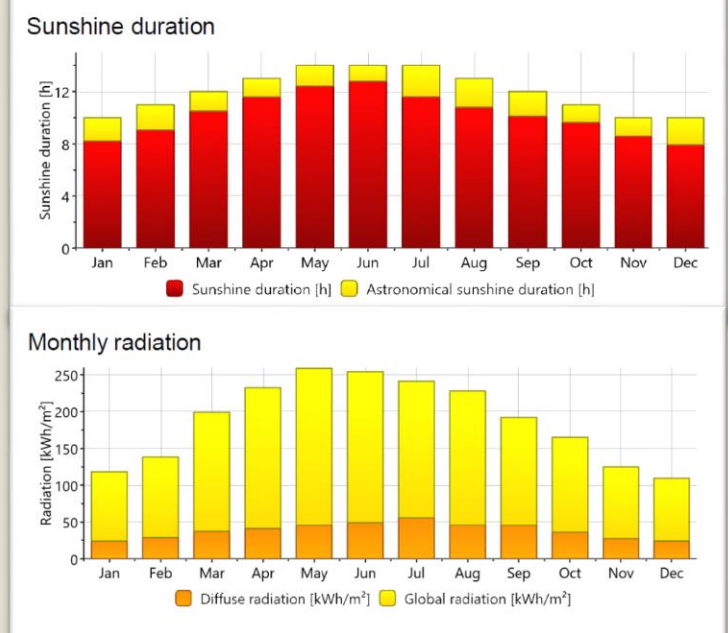
1. Research Problem

Solar energy has traditionally been the renewable energy source for home use in industrialized countries when climatic circumstances permitted. For the past decade, both solar heat collectors and photovoltaic panel installations have seen considerable growth in their use in the home. Ciudad Juárez has a high potential in using solar energy due to the high sunlight duration and radiation. However, these technologies have a low usage rate, even though the use of cogeneration solar systems can support the energy needs of local industries, reduce air pollution and dependence on fossil fuels.



2. Research objectives

- To model a solar cogeneration system according to the position of Ciudad Juárez.
- To calculate the system performance parameters for 4E proposed cogeneration system.
- To investigate the possibility of adding another renewable energy source as an alternative for lack of sunlight conditions.
- To optimize the final proposed system using one-objective and multi-objective algorithms.



3. Methodology

1. Literature Review

2. System Design

3. Validation

4. Experimental measurements

5. Gathering Data

6. Modeling

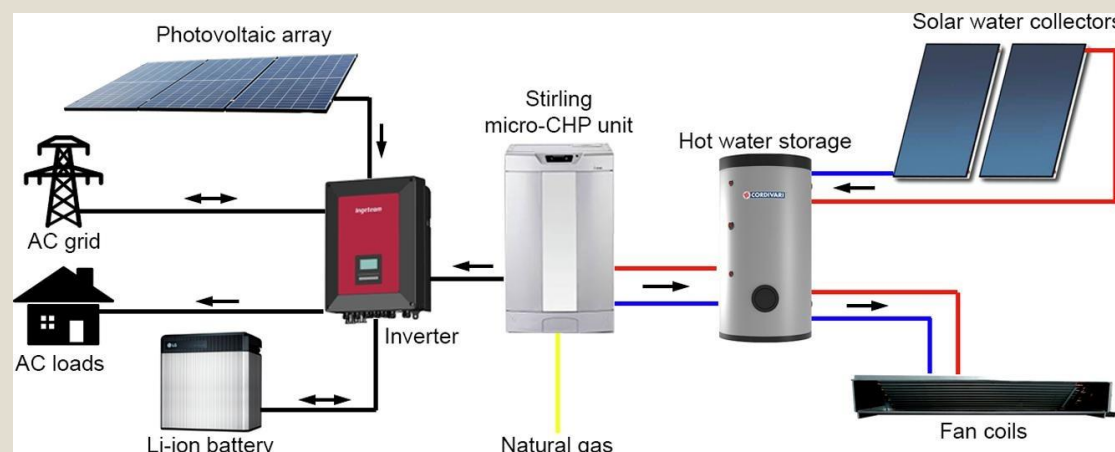
7. Analyzing and evaluation

8. Drawing output results

9. Results presentation

10. Final thesis report

4. Proposed model



5. Materials

Experimental model systems

EES, HOMER, TRNSYS

OriginPro, Tecpolt

6. Possible results

1. A research to measure the level of implementation of CHP and Sustainability in manufacturing companies.

2. Three articles indexed in the Journal Citation Reports due to the analysis of the information obtained from this research.

3. Participation in at least two national or international congresses.

4. An international academic research stay.

5. A PhD thesis

References

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