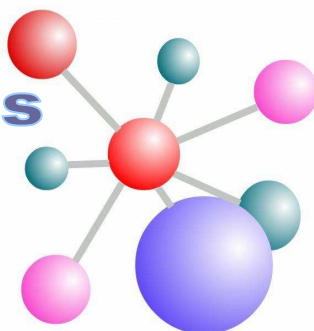


Inglês



Ciências Biológicas

Instruções

- | | |
|-----------|--|
| 1 | Confira se os dados contidos na parte inferior desta capa estão corretos e, em seguida, assine no espaço reservado para isso.
Se, em qualquer outro local deste Caderno, você assinar, rubricar, escrever mensagem, etc., será excluído do Exame. |
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| 9 | Você dispõe de, no máximo, três horas, para responder as 5 questões que constituem a Prova. |
| 10 | Antes de retirar-se definitivamente da sala, devolva ao Fiscal este Caderno. |

Assinatura do Candidato: _____

As questões de 01 a 05, cujas respostas deverão ser redigidas EM PORTUGUÊS, referem-se ao texto abaixo.

Toward clean environment: evaluation of solar electric power technologies using fuzzy logic

Omar Badran, Rustom Mamlook, Emad Abdulhadi

The rapid expansion of the use of solar energy power plants worldwide is a subject that is being followed with interest. Fuzzy logic methodology is used for evaluating the solar thermal power technology, it compresses huge amount of data into smaller sets, and it has the ability to decide between different solar technologies on the basis of their benefits and costs. The most often considered solar technologies were parabolic trough, central receiver, dish sterling engine, compact linear Fresnel reflector (CLFR), solar chimney, photovoltaic (PV), and solar pond. The aim of our research is to provide the needed information to make a judgment or a decision of adopting the most preferred solar technology in terms of installation and development using fuzzy set methodology. The criteria of the evaluation were based on different parameters, i.e., power capacity, efficiency, availability, capacity factor, storage capability, cost, maturity, water usage, land usage, and safety. The key barriers and features for each technology on the basis of benefit-to-cost ratios are addressed. The results showed that CLFR was found to be the best choice in terms of research, development, and implementation, followed by parabolic trough technology, then the central receiver technology, dish sterling engine, solar chimney, PV, and solar pond, according to the order of preference.

Electricity production using solar thermal energy is currently one of the main research areas in the field of renewable energies. The significant price fluctuations that are seen for the fossil fuel on one hand, and the trend toward privatization that dominates the power markets these days on the other hand, will drive the demand for solar technologies in the near future. Different types of solar power plants need further improvements and cost reduction to be competitive with fossil fuel power plants in future power markets. Price and Kearney (2003) reviewed the current cost of energy and the potential for reducing the cost of energy from parabolic trough solar power plant technology based on the latest technological advancements and projected improvements proposed from industry and sponsored research and development (R&D) institutions.

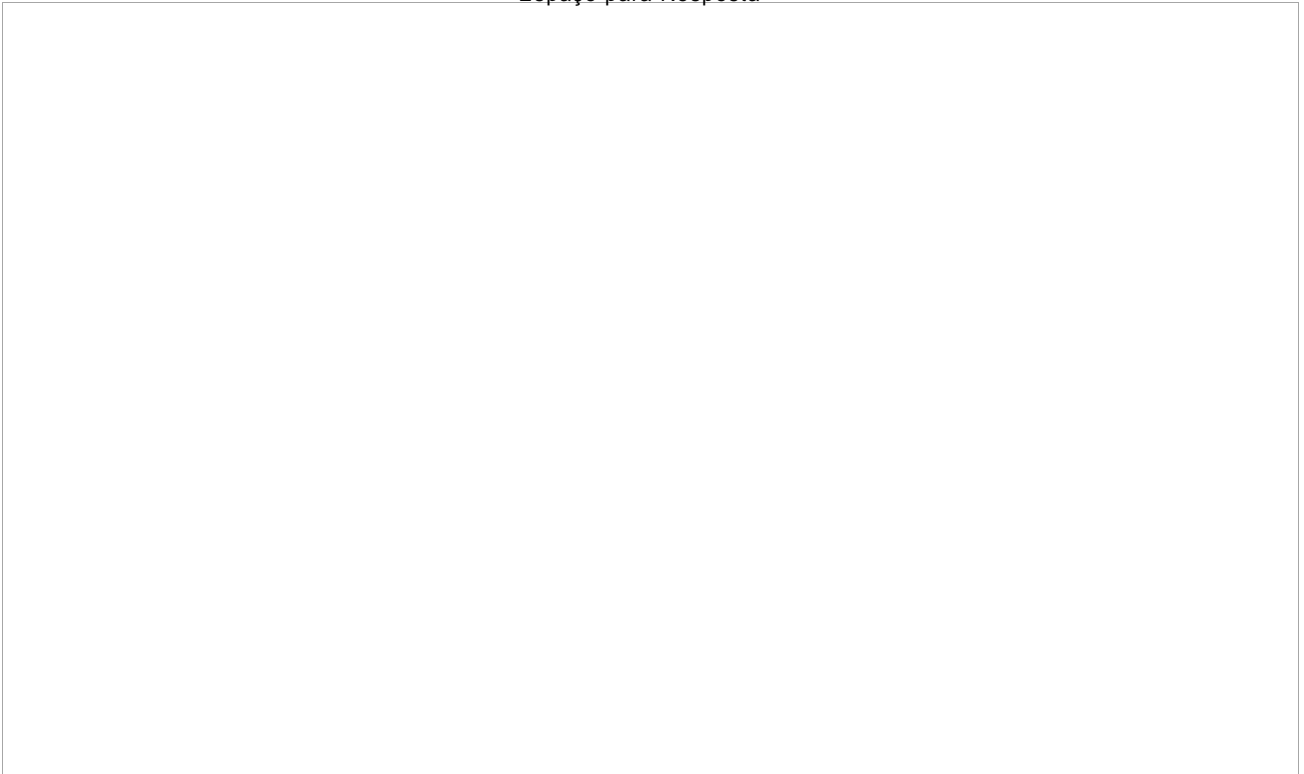
Another study has been made by the National Renewable Energy Laboratory (NREL) to evaluate the potential for the emerging photovoltaic (PV) technologies to meet the solar program's technical and economic targets. They also discussed the current structure, capabilities, and assumptions, and made a linear programming model of capacity expansion for the concentrating solar power (CSP). The results are presented for the impact of continued R&D for the CSP to drive down the solar electric power (Braun and Skinner 2007; Blair et al. 2006). The solar energy flux reaching the Earth's surface represents a few thousand times the current use of primary energy by the humans. Earth receives 174 petawatt of incoming solar radiation at any given time; unfortunately, this huge amount of energy has not been well utilized till now. There are many advantages for solar power plants. They can be used in large scale power generation. The modular character of the solar field enables it to start at any power level. Off-grid solar power for remote locations maybe competitive to fossil fuel power, because the energy at remote locations becomes costly because it requires to be distributed over very long distances (Schott 2006).

Clean Technologies and Environmental Policy, 26 July 2011, pp. 1-11

Questão 1

Informe qual é a metodologia citada no texto e descreva a sua função.

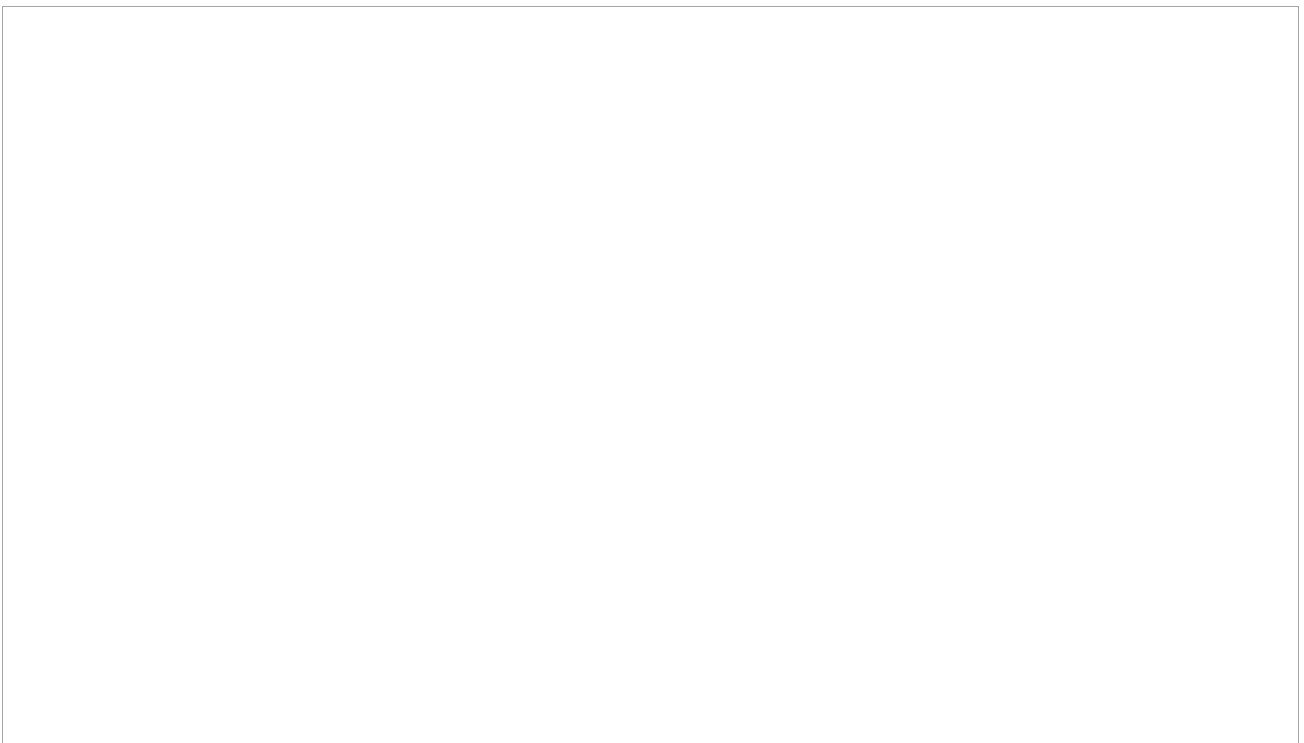
Espaço para Resposta



Questão 2

Qual é o objetivo da pesquisa?

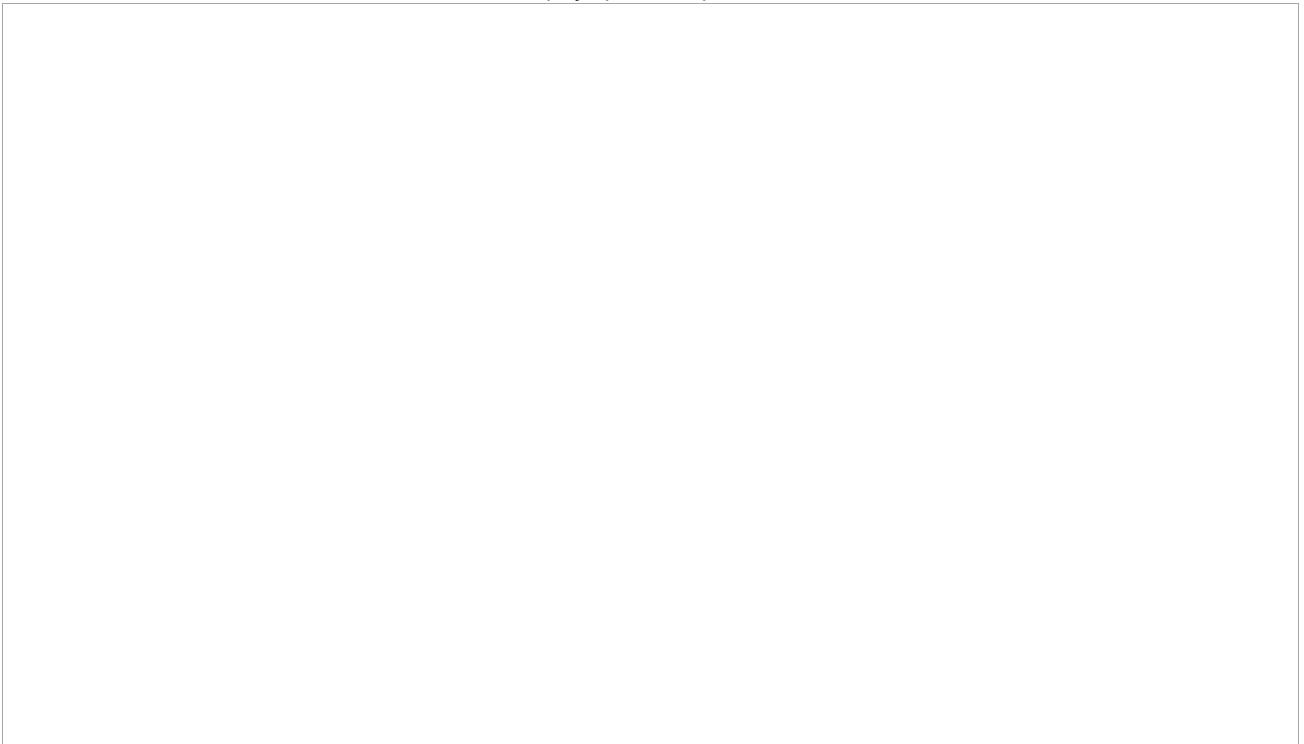
Espaço para Resposta



Questão 3

Aponte os critérios de avaliação usados na pesquisa.

Espaço para Resposta



Questão 4

Cite os dois fatores que, de acordo com o texto, determinarão a demanda por tecnologias solares.

Espaço para Resposta

