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Development of a Solar Power Plant

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South Africa has limited electricity resources and many parts of the country have limited access to electricity. Electricity capacity is at maximum and almost each Giga Watt is accounted for. Predictions suggest South Africa would have a serious electricity allocation problem in the very near future and current rolling blackout in many of our cities can attain to the looming problem. The energy crisis in South Africa has highlighted the need to increase electricity generation capacity and to search for alternative energy sources.

Solar chimney plants could form part of the solution in the near future in South Africa to create additional power. Solar radiation energy is abundant in South Africa, while wind sources are limited to some coastal regions. This study will aim in developing a wind generation system in areas where wind is very low. A solar chimney power plant is expected to provide remote areas in South Africa with electric power, or complementing the current electricity grid.

Research on alternative designs within the South Africa context and particularly on increasing the effectiveness of the solar chimney power plant technology is lacking, therefore this study proposes the development of an alternative solar chimney plant technology which endeavour to improve the effectiveness of the solar chimney power plant.

The outcomes of the simulations have shown that you can generate power if the relative ratio between the height and the inlet aperture of the power plant is optimized. The completed small pilot power plant was used to test the effectiveness of the power plant.

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