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Analytical design for CL-CSP system and review of its working for a 30 kWt CL-CSP system at RGPV, Bhopal, India

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Solar photo voltaic (PV) technology has been used for long to generate power from the sun. But its use has remained limited because of its low efficiency and other constraints. Now, concentrating solar power (CSP) is emerging as a viable alternative. Unlike PV cells which are flat, CSP involves the use of parabolic mirrors in long troughs, which concentrate solar irradiation into a centrally placed special tube which absorbs radiation. The heat generated into the tube is then used to produce electricity. To contribute in target of Government of India, RGPV started a Indo-Japanese collaborative R&D project on a path breaking and innovative solar thermal technology with the collaboration with Prof.Y.Tamaura, Emeritus Professor, Tokyo institute of technology Japan. This Technology is known as Cross Linear-Concentrated Solar Power (CL-CSP).This technology is amalgamation of two exiting solar thermal technology i.e. Linear Fresnel and Solar Tower. CL-CSP has virtues of both conventional Linear Fresnel and Tower technologies. In this innovative and breakthrough CL-CSP technology temperature of 600 ^{O}C will be achieved by concentrating solar to the receiver. The Heliostat use in this new technology is gyro type with E-W and N-S tracking facility, which is first time manufacture in world wide. The power consumption for operational of this tracking mechanism is very less. The heliostat is very cost effective with reflective efficiency of 95% and weight 90 kg with approx. 3.5 m^2 area as compare with conventional heliostat and air is being used as a heat transfer medium in the solar air receiver which can further can be utilized to generate steam. This Technology may be substitution of coal for existing Thermal Power Plants during the day Time. As the Thermal to Thermal Conversation efficiency is 80%. This can also replace Fossil Fuels in Factories/industries and use for Hybrid Technology for CSP Plants.

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