

PERFORMANCE ANALYSIS OF CANAL TOP SOLAR PV PLANT (REPORT)



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About the Report

Present report summarizes findings of the performance study of 1 MW Canal top SPV plant at Chandrasan Village and GTPS 1 MW PV plant at Ash – Dyke in Pethapur, Gandhinagar and PV module degradation study of solar PV modules from both the plants. Both the plants are owned by Gujarat State Electricity Corporation Limited (GSECL). GTPS 1 MW SPV plant has demonstrated 5 different technologies.

Electricity generation, plant failure events of individual solar PV module technologies and inverter types from November – 2014 to October – 2015 available from GTPS 1 MW SPV have been collected and analyzed. Grid – failure period have been discarded from the operation period of the plant for the purpose of evaluating performance of different technologies. Grid – failure events are analyzed separately.

Based on the data analysis, it was observed that despite compromised solar angles, canal top solar PV plant seems to over – perform GTPS 1 MW or PDPV 1 MW SPV plant. Canal bank project has started providing data for couple of months. Based on the performance parameters i.e. performance ratio (PR), weighted energy generation (kWh / kW), CUF of canal top and canal bank projects, canal top project has found to perform better than canal bank power plant. Crystalline solar PV module technology has performed better than other semiconductors whereas performance of string inverter or central inverter is found to be equal.

Findings of the performance analysis of GTPS 1 MW SPV plant are presented in Chapter - 1.

Chapter – 2 summarizes findings of plant performance of canal top and canal bank SPV project based on available data since inception.

Chapter – 3 provides results of PIV test results of solar PV modules and comparative study of all three of these power plants with PDPU 1 MW SPV plant installed in Gandhinagar.

Chapter – 4 comparative performance of all four power plants.

Chapter – 5 summarizes findings of the complete study. The study has enabled us to identify issues, challenges and opportunities which can be addressed through R&D assignments by GERMI.

We believe that with rich content, report is expected to be very useful to all stake-holders.

We would like to inform the readers that at GERMI we encourage young graduates to take part in our research activities. This way, we help them orienting towards renewable energy at the same time, they contribute to the project work and sharpen their skills. Present report has been prepared with support from my M.Tech. student interns Ms. Shagufta Shahnaz, Mr. Saravanan Saha (Final Year M.Tech. – Energy & Environmental Sciences from Vellore Institute of Technology), Mr. Vivek Jaiswal (M.Tech. from School of Technology, Pandit Deendayal Petroleum University), Mr. Divyank Tripathi and Ms. Sneha Krishnan and my colleagues Mr. Jithin KT, Mr. Vikram Barot and Mr. Devendrasinh Darbar. I would also like to acknowledge help and support received from our office boy Mr. Mahendra and Mr. Kunal.

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- Dr. Sagarkumar M. Agravat

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