

COMPARISON OF DIFFERENT TYPES OF PHOTO VOLTAICS AT ONE SITE

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Abstract

In May 2015 A4 Campus AB made a 30 kWp solar cell installation in cooperation with Mid Sweden University at one of the university buildings in Östersund. Four different types of solar cells were being installed each type with a power of about 7 kW; two types of polycrystalline silicon panels, one monocrystalline silicon type and one thin film (CuInSe₂) type. The three types of crystalline panels were equipped with individual optimizers making individual panel follow up possible. A one year evaluation shows the installed thin film panels produces more electricity (as Wh per installed W) than do any of the installed crystalline types. The efficiency of the thin film panels is relatively higher compared to the crystalline panels those days when the insolation is lower, which might indicate future climate change should be taken into consideration when choosing which type of solar cells to install (for northern Sweden more rain is being predicted). Each one of the crystalline types are installed as a matrix with 2 or 3 rows. The lowest rows of each type produces more electricity compared to the row above. This might be caused by an increased temperature of the air flow behind the panels. However, during the period November to April the production especially of the lower rows is reduced due to snow coverage. For multiple row installation this phenomenon should be taken into consideration for calculations for optimal layout (1,7-1,9% reduction per row for 3 rows).

Out from the follow-up made it can be seen that the evaluation of offers from different manufactures is rather complex and the yearly production cannot be easily calculated of from the specified efficiency. A 6% difference in power output from crystalline types can be seen at an insolation close to 1.000 W/m² and the difference in efficiency given in the specifications is in the range 15,2% to 15,8%.