Bab 5

Simpulan dan Saran

5.1 Kesimpulan

Setelah penjelasan latar belakang, tinjauan pustaka, dan perancangan sistem yang dijelaskan pada bab 1 hingga bab 5, maka dapat diambil kesimpulan berupa:

1. Reflektor dipasang pada bagian samping panel surya dan sistem pendingin dengan metode *water treatments* digunakan untuk meningkatkan penyerapan sinar matahari sehingga efisiensi dari panel surya meningkat.
2. Temperatur maksimum dari panel surya tanpa reflektor sebelum pendinginan adalah 57.3°C. Sedangkan temperatur maksimum dari panel surya dengan reflektor sebelum proses pendinginan adalah 61.3°C. Sesudah proses pendinginan temperatur panel surya dengan dan tanpa reflektor menjadi 29.5°C. Proses pendinginan dilakukan saat panel surya mencapai temperatur maksimal. Pompa akan menyala selama 43.46 detik berdasarkan *cooling rate model* yang telah dihitung.
3. Sinar radiasi matahari sebelum reflektor dipasang pada panel surya adalah 869.61 W/m^2 dan sesudah reflektor dipasang pada bagian samping panel surya, radiasi matahari yang ditangkap meningkat menjadi 871.10 W/m^2. Radiasi 871.10 W/m^2 didapat dengan menggunakan reflektor berbahan *aluminium foil* dengan derajat kemiringan 55°.
4. Efisiensi panel surya tanpa reflektor dan sistem pendingin adalah 5.52%. Setelah proses pendinginan dilakukan dengan menggunakan *water treatments*, efisiensi mengalami pengingkatan menjadi 6.8%. Setelah itu penelitian panel surya dengan reflektor tanpa pendingin dilakukan dan didapatkan nilai efisiensi meningkat menjadi 7.35%. Kemudian, metode pendinginan dilakukan pada panel surya berreflektor dan didapatkan efisiensi 10.36%.

5. Energi yang digunakan pompa saat proses pendinginan berlangsung selama 4 jam adalah 2.09 Wh dan energi total yang dihasilkan sebelum dan setelah proses pendinginan dengan metode permukaan panel dialirkan air dilakukan adalah 3996.77 Wh. Sehingga energi yang tersisa adalah 3994.68 Wh.

5.2 Saran

Saran agar dapat meningkatkan kualitas penelitian ini:

1. Air yang digunakan untuk mendinginkan panel surya diganti secara berkala agar proses penangkapan radiasi matahari yang dilakukan oleh panel surya tidak terhalang oleh debu.
2. Sudut reflektor optimal dapat diujicoba melalui pengambilan data terlebih dahulu.
3. Saat ujicoba menggunakan lampu halogen dilakukan, sebaiknya jarak antara lampu dengan panel surya tidak terlalu jauh agar proses pemanasan dapat berlangsung dalam kurun waktu yang lebih cepat.

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