System with solar power and battery

(1)

is the average power the house will consuming in epoch t

Workload is the amount of offered computational load

Equation 1 shows the workload is non-deferrable situation

(2)

The average power during an epoch cannot be higher than the maximum power the load can consume

(3)

Three sources are used in power system: Solar Power (), Grid Power () and battery discharge ()

(4)

Solar power used for multiple purpose: running workloads (), charging battery ()

(5)

Similarly, the grid can be used to power the workload () and charging battery ()

(6)

Equation 6 specifies that the power discharged from the battery is never great than the power charged to the battery multiplied by the inefficiency parameter e

(7)

This constaint states that the energy stored in the battery, which is the difference between the energy charged to or discharge from the battery over the previous time intervals, cannot be greater than its capacity C

(8)

(9)

(10)

(11)

(12)

(13)

(14)