Compare the energy at 15◦C,1 atm pressure, contained in 1 m^2 of the following wind regimes:

a. 100 hours of 6-m/s winds (13.4 mph),

b. 50 hours at 3 m/s plus 50 hours at 9 m/s (i.e., an average wind

$$P_w = \frac{1}{2}\rho A v^3$$

- ***Solution***
- a. With steady 6 m/s winds, all we have to do is multiply power times hours:

  Energy (6 m/s) $= \frac{1}{2}\rho A v^3 t = \frac{1}{2}(1.225\ \mathrm{kg/m^3}).(1m^2).\left(\frac{6m}{s}\right)^3(100h) =$ 13,230 Wh
- b. With 50 h at 3 m/s

  Energy (3 m/s) $= \frac{1}{2}\rho A v^3 t = \frac{1}{2}(1.225\ \mathrm{kg/m^3}).(1m^2).\left(\frac{3m}{s}\right)^3(50h) =$ 827 Wh

- And 50 h at 9 m/s contain Energy (9 m/s) $= \frac{1}{2}(1.225\ \mathrm{kg/m^3}).(1m^2).\left(\frac{9m}{s}\right)^3(50h) =$ 22,326 Wh
- for a total of 827 + 22,326 = 23,152 Wh