Contents

Turbine power curve data

```
clc, clear all, close all
del_u = 0.5;
u = [0:del_u:25]';
P = [0
0
0
2
3
12
25
55
82
127
174
250
321
420
532
670
815
1000
1180
1380
1580
1690
1810
1900
1980
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```
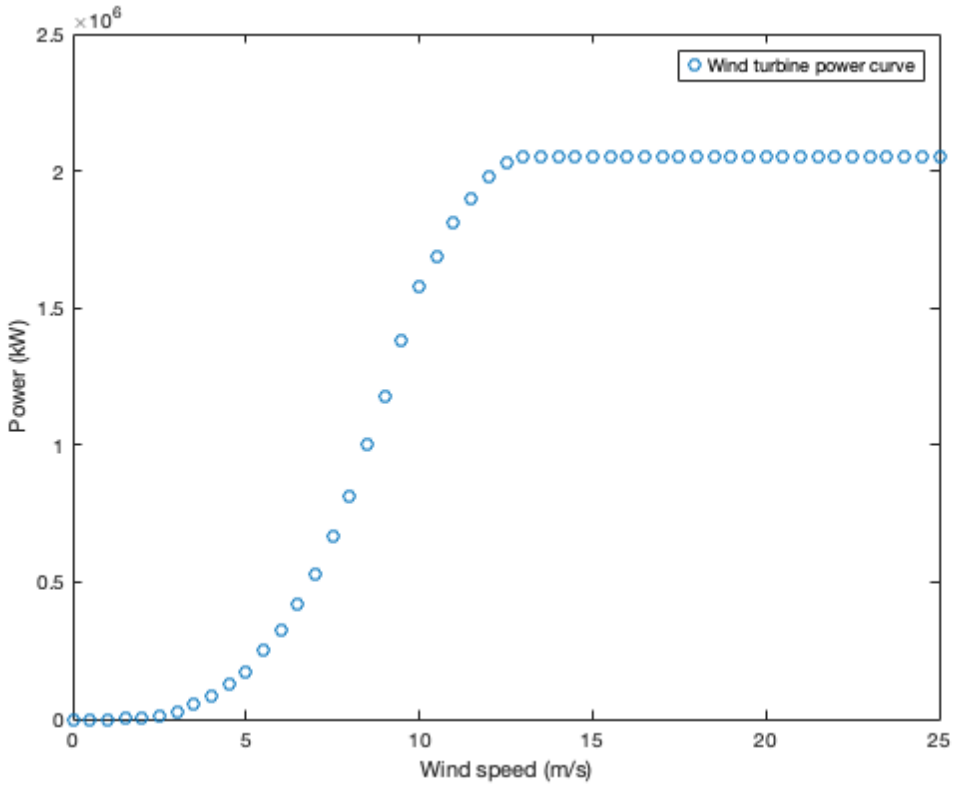

```
2050
2050]*1000;
```

Plotting

```
figure
plot(u,P,'o')
legend('Wind turbine power curve')
ylabel('Power (kW)')
xlabel('Wind speed (m/s)')
```



Calculations

```
z0 = 0.001; % Surface roughness
us = 6; % Observed wind speed at observed height
zs = 10; % Observed height
turbineHeight = 85;
alpha = 0.5*(z0/10)^0.2;
u_turbineHeight = us*(turbineHeight/zs)^alpha; % FIXED FORMULA, divided by zs
c = 2*u_turbineHeight/sqrt(pi); % CONSTANT 2
Rayleigh = (2*u/c^2).*exp(-(u/c).^2);
P_avg = sum(P.*Rayleigh)*(del_u) % NOT SQUARE
CapacityFactor = P_avg/2050000
```

```
P_avg =
   7.4321e+05
CapacityFactor =
    0.3625
```

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