One-bladed turbine produces more power than two-bladed, but places higher force on support structures.

\[
\lambda = \frac{R_{\text{tip}}}{U_{\infty}}
\]

\[
C_p = \frac{(\text{tip})}{(\text{base})}
\]

time-average performance coefficient

\[
C_{p, \text{blade}} = C_{p, \text{turbine}} \cdot C_{p, \text{strut}}
\]

blade-only performance

\[
C_f(\theta) = \frac{f_2(\theta) + f_3(\theta)}{\frac{1}{2} \rho n A U_{\infty}^2}
\]

phase-average force coefficient

- \( R \): turbine radius
- \( \omega \): rotation speed
- \( U_{\infty} \): free-stream velocity
- \( c \): torque generated
- \( \rho \): water density
- \( A \): turbine cross-sectional area
- \( \theta \): turbine azimuthal position
- \( f_2(\theta) \): phase-average force

\( Re = 67,000 \)

\( Re = 374,000 \)