List of Symbols

m_3'	mean of the cube of the wind speed
m_2'	mean of the square of the wind speed
$\overline{WPD}$	Input wind power density (W/m^2)
$\overline{FF}$	Mean of the FF_i
$\overline{v_a}$	mean wind speed at anemometer height
$\bar{v}_z$	Vertical mean wind profile
$P(v \geq 0)$	Total frequency for wind speed
Δv	Class width
A	Turbine blade swept area
$E(V)$	Input wind power (W)
E_{output}	Total energy generated during a given period
E_{pf}	Energy pattern factor
Error (%)	Percentage error in the wind power density
$f(v, \theta)$	Probability density function
$F(v,\theta)$	Cumulative distribution function
FF_i	Estimated cumulative distribution functions of the wind speed data
F_i	Empirical cumulative relative frequency
$I(\kappa)$	modified Bessel function of the first kind
$I(\mu,\sigma)$	Normalization factor
k	Shape parameter of the Weibull distribution
$m[W(x,y)]$	Mixture Weibull distribution with number of parameters
mvM.pdf	mixture von Mises distribution
N	Number of different observed wind data
n	Sample size
η_{ele}	Electrical efficiency of the system
η_{mech}	Mechanical efficiency of the system
p	Ratio of the cut-in speed to the rated wind speed of the turbine
$P(v)$	frequency of the class width

$P_{avg}(v)$	Average output power
$P_e(v)$	Output power
P_i	Observed cumulative relative frequencies of the wind speed data
$P_n(v)$	Normalized output power
P_r	Rated power
P_{total}	Total power input
q	Ratio of the cut-out speed to the rated wind speed of the turbine
q_a	quantile of the order a
R_N	Random variable
s	Scale parameter of the Weibull distribution (m/s)
s_a	Scale parameter at anemometer height
T	Time period
v	Wind speed
V_c	Cut-in wind speed of the wind turbine
V_d	Design wind speed
V_f	Cut-out or furling wind speed of the turbine
$vM.pdf$	von Mises distribution
V_r	Rated wind speed of the turbine
V_r/s	Normalized rated wind speed
w	weight parameter
$W(k,s)$	Weibull distribution with shape and scale parameters
z	Height at which parameters are to be estimated
z_a	Anemometer height
z_{ref}	Reference height
α	Hellmann exponent
β	Scale parameter of the Gamma distribution
Γ	Complete Gamma function
γ	Lower incomplete Gamma function
ζ	Shape parameter of the Gamma distribution
λ	Lagrange multiplier
ρ	Density of air
τ	curvature parameter