

Appendix:  
Nomenclature

$V_{\text{cut-in}}$	Cut in wind speed ( $\frac{\text{m}}{\text{s}}$ )	$P_m$	Mechanical power of the turbine (kw)
$V_{\text{cut-out}}$	Cut out wind speed ( $\frac{\text{m}}{\text{s}}$ )	$T_m$	Mechanical torque of the turbine (nm)
$V_{\text{rated}}$	Rated wind speed ( $\frac{\text{m}}{\text{s}}$ )	Psf	Power signal feedback
$\lambda, \text{TSR}$	Tip speed ratio	P&o	Perturbation and observation
$\lambda_{\text{opt}}$	Optimal tip speed ratio	Hcs	Hill climb searching
$P_{\text{msg}}$	Permanent magnet synchronous generator	D	Duty cycle of the converter
$M_{\text{pp}}$	Maximum power point	$I_{\text{in}}$	Input current of the converter (a)
$D_{\text{cm}}$	Discontinuous conduction mode	$V_{\text{in}}$	Input voltage of the converter (a)
$P_{\text{fc}}$	Power factor correction	$\omega$	Generator speed ( $\text{rad/s}$ )
$T_{\text{hd}}$	Total harmonic distortion	$\omega^*$	Optimal generator speed ( $\text{rad/s}$ )
$M_{\text{ppt}}$	Maximum power point tracking	$\alpha$	Constant scaled factor
$\rho$	Air density ( $\frac{\text{kg}}{\text{m}^3}$ )	$V_{\text{ref}}$	Input voltage reference of the converter (v)
$V_w$	Wind speed ( $\frac{\text{m}}{\text{s}}$ )	$V_{\text{dc}}$	Output voltage of the rectifier (v)
$C_p$	power coefficient	Otc	Optimal torque characteristics
$\beta$	Blade pitch angle (degree)	R	Turbine radius (m)
$\omega_m$	Mechanical angular velocity of the rotor ( $\text{rad/s}$ )	$C_{p \text{ max}}$	Maximum coefficient of power