6.3 Appendix: Parameters and assumptions used for PV simulation

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Grid-Connected System: Simulation parameters					
Project :	**Perth 2003 LT**				
Geographical Site	**Perth**			**Country**	**Australia**
Situation	Latitude	32.1°S		Longitude	116.0°E
Time defined as	**Legal Time**	Time zone UT+8		Altitude	5 m
	Albedo	0.20			
Meteo data :	Perth 2003 LT				
Simulation Variant :	**Simulation variant**				
	Simulation date	23/04/07 14h46			
Simulation parameters					
Collector Plane Orientation	Tilt	25°		Azimuth	0°
Horizon	Free Horizon				
Near Shadings	No Shadings				
PV Array Characteristics					
PV module Si-poly	Model	**BP 380**			
	Manufacturer	BP SOLAR			
Number of PV modules	In series	12 modules		In parallel	1 strings
Total number of PV modules	Nb. modules	12		Unit Nom. Power	80 Wp
Array global power	Nominal (STC)	**960 Wp**		At operating cond.	870 Wp (50°C)
Array operating characteristics (50°C)	U mpp	195 V		I mpp	4 A
Total area	Module area	**7.8 m²**			
PV Array loss factors					
Heat Loss Factor	ko (const)	29.0 W/m²K		kv (wind)	0.0 W/m²K / m/s
=> Nominal Oper. Coll. Temp. (800 W/m², Tamb=20°C, wind 1 m/s)				NOCT	45 °C
Wiring Ohmic Loss	Global array res.	1463.1 mOhm		Loss Fraction	3.1 % at STC
Serie Diode Loss	Voltage Drop	0.7 V		Loss Fraction	0.3 % at STC
Module Quality Loss				Loss Fraction	3.0 %
Module Mismatch Losses				Loss Fraction	2.0 % at MPP
Incidence effect, ASHRAE parametrization	IAM =	1-bo (1/cos i - 1)		bo Parameter	0.05
System Parameter	System type	**Grid-Connected System**			
Inverter	Model	**Sunny Boy SWR 850 E**			
	Manufacturer	SMA			
Inverter Characteristics	Operating Voltage	150-300 V		Unit Nom. Power	0.9 kW AC
User's needs :	Unlimited load (grid)				

Grid-Connected System: Simulation parameters

Project :	**Geraldton 2003 LT**			
Geographical Site	**Geraldton**		**Country**	**Australia**
Situation	Latitude	28.8°S	Longitude	114.6°E
Time defined as	**Legal Time**	Time zone UT+8	Altitude	5 m
	Albedo	0.20		
Meteo data :	Geraldton 2003 LT			

Simulation Variant :	**Simulation variant**	
	Simulation date	23/04/07 14h13

Simulation parameters

Collector Plane Orientation	Tilt	25°	Azimuth	0°
Horizon	Free Horizon			
Near Shadings	No Shadings			

PV Array Characteristics

PV module	Si-poly	Model	**BP 380**		
		Manufacturer	BP SOLAR		
Number of PV modules		In series	12 modules	In parallel	1 strings
Total number of PV modules		Nb. modules	12	Unit Nom. Power	80 Wp
Array global power		Nominal (STC)	**960 Wp**	At operating cond.	870 Wp (50°C)
Array operating characteristics (50°C)		U mpp	195 V	I mpp	4 A
Total area		Module area	**7.8 m²**		

PV Array loss factors

Heat Loss Factor	ko (const)	29.0 W/m²K	kv (wind)	0.0 W/m²K / m/s
=> Nominal Oper. Coll. Temp. (800 W/m², Tamb=20°C, wind 1 m/s)			NOCT	45 °C
Wiring Ohmic Loss	Global array res.	1463.1 mOhm	Loss Fraction	3.1 % at STC
Serie Diode Loss	Voltage Drop	0.7 V	Loss Fraction	0.3 % at STC
Module Quality Loss			Loss Fraction	3.0 %
Module Mismatch Losses			Loss Fraction	2.0 % at MPP
Incidence effect, ASHRAE parametrization	IAM =	1-bo (1/cos i - 1)	bo Parameter	0.05

System Parameter	System type	**Grid-Connected System**		
Inverter	Model	**Sunny Boy SWR 850 E**		
	Manufacturer	SMA		
Inverter Characteristics	Operating Voltage	150-300 V	Unit Nom. Power	0.9 kW AC

User's needs : Unlimited load (grid)

Grid-Connected System: Simulation parameters

Project :	**Katanning 2003 LT**			
Geographical Site	**Katanning LT**		**Country**	**Australia**
Situation	Latitude	33.7°S	Longitude	117.5°E
Time defined as	**Legal Time**	Time zone UT+8	Altitude	5 m
	Albedo	0.20		
Meteo data :	Katanning 2003 LT			

Simulation Variant :	**Simulation variant**	
	Simulation date	01/05/07 09h30

Simulation parameters

Collector Plane Orientation	Tilt	25°	Azimuth	0°
Horizon	Free Horizon			
Near Shadings	No Shadings			

PV Array Characteristics

PV module	Si-poly	Model	**BP 380**		
		Manufacturer	BP SOLAR		
Number of PV modules		In series	12 modules	In parallel	1 strings
Total number of PV modules		Nb. modules	12	Unit Nom. Power	80 Wp
Array global power		Nominal (STC)	**960 Wp**	At operating cond.	870 Wp (50°C)
Array operating characteristics (50°C)		U mpp	195 V	I mpp	4 A
Total area		Module area	**7.8 m²**		

PV Array loss factors

Heat Loss Factor	ko (const)	29.0 W/m²K	kv (wind)	0.0 W/m²K / m/s
=> Nominal Oper. Coll. Temp. (800 W/m², Tamb=20°C, wind 1 m/s)			NOCT	45 °C
Wiring Ohmic Loss	Global array res.	1463.1 mOhm	Loss Fraction	3.1 % at STC
Serie Diode Loss	Voltage Drop	0.7 V	Loss Fraction	0.3 % at STC
Module Quality Loss			Loss Fraction	3.0 %
Module Mismatch Losses			Loss Fraction	2.0 % at MPP
Incidence effect, ASHRAE parametrization	IAM =	1-bo (1/cos i - 1)	bo Parameter	0.05

System Parameter	System type	**Grid-Connected System**		
Inverter	Model	**Sunny Boy SWR 850 E**		
	Manufacturer	SMA		
Inverter Characteristics	Operating Voltage	150-300 V	Unit Nom. Power	0.9 kW AC

User's needs : Unlimited load (grid)

Grid-Connected System: Simulation parameters

Project :	**Kalgoorlie 2003**				
Geographical Site		**Kalgoorlie**		**Country**	**Australia**
Situation		Latitude	30.8°S	Longitude	121.5°E
Time defined as		**Legal Time**	Time zone UT+8	Altitude	5 m
		Albedo	0.20		
Meteo data :	Kalgoorlie 2003 LT				

Simulation Variant :	**Simulation variant**		
	Simulation date	01/05/07 22h19	

Simulation parameters

Collector Plane Orientation	Tilt	25°	Azimuth	0°
Horizon	Free Horizon			
Near Shadings	No Shadings			

PV Array Characteristics

PV module	Si-poly	Model	**BP 380**		
		Manufacturer	BP SOLAR		
Number of PV modules		In series	12 modules	In parallel	1 strings
Total number of PV modules		Nb. modules	12	Unit Nom. Power	80 Wp
Array global power		Nominal (STC)	**960 Wp**	At operating cond.	870 Wp (50°C)
Array operating characteristics (50°C)		U mpp	195 V	I mpp	4 A
Total area		Module area	**7.8 m²**		

PV Array loss factors

Heat Loss Factor	ko (const)	29.0 W/m²K	kv (wind)	0.0 W/m²K / m/s
=> Nominal Oper. Coll. Temp. (800 W/m², Tamb=20°C, wind 1 m/s)			NOCT	45 °C
Wiring Ohmic Loss	Global array res.	1431.8 mOhm	Loss Fraction	3.0 % at STC
Serie Diode Loss	Voltage Drop	0.7 V	Loss Fraction	0.3 % at STC
Module Quality Loss			Loss Fraction	3.0 %
Module Mismatch Losses			Loss Fraction	2.0 % at MPP
Incidence effect, ASHRAE parametrization	IAM =	1-bo (1/cos i - 1)	bo Parameter	0.05

System Parameter	System type	**Grid-Connected System**		
Inverter	Model	**Sunny Boy SWR 850 E**		
	Manufacturer	SMA		
Inverter Characteristics	Operating Voltage	150-300 V	Unit Nom. Power	0.9 kW AC

User's needs : Unlimited load (grid)

Grid-Connected System: Simulation parameters

Project :	**Carnarvon**				
Geographical Site		**Carnarvon**		**Country**	**Australia**
Situation		Latitude	24.9°S	Longitude	113.7°E
Time defined as		**Legal Time**	Time zone UT+8	Altitude	5 m
		Albedo	0.20		
Meteo data :	Carnarvon				

Simulation Variant :	**Simulation variant**		
	Simulation date	27/04/07 22h37	

Simulation parameters

Collector Plane Orientation	Tilt	25°	Azimuth	0°
Horizon	Free Horizon			
Near Shadings	No Shadings			

PV Array Characteristics

PV module	Si-poly	Model	**BP 380**		
		Manufacturer	BP SOLAR		
Number of PV modules		In series	12 modules	In parallel	1 strings
Total number of PV modules		Nb. modules	12	Unit Nom. Power	80 Wp
Array global power		Nominal (STC)	**960 Wp**	At operating cond.	870 Wp (50°C)
Array operating characteristics (50°C)		U mpp	195 V	I mpp	4 A
Total area		Module area	**7.8 m²**		

PV Array loss factors

Heat Loss Factor	ko (const)	29.0 W/m²K	kv (wind)	0.0 W/m²K / m/s
=> Nominal Oper. Coll. Temp. (800 W/m², Tamb=20°C, wind 1 m/s)			NOCT	45 °C
Wiring Ohmic Loss	Global array res.	1463.1 mOhm	Loss Fraction	3.1 % at STC
Serie Diode Loss	Voltage Drop	0.7 V	Loss Fraction	0.3 % at STC
Module Quality Loss			Loss Fraction	3.0 %
Module Mismatch Losses			Loss Fraction	2.0 % at MPP
Incidence effect, ASHRAE parametrization	IAM =	1-bo (1/cos i - 1)	bo Parameter	0.05

System Parameter	System type	**Grid-Connected System**		
Inverter	Model	**Sunny Boy SWR 850 E**		
	Manufacturer	SMA		
Inverter Characteristics	Operating Voltage	150-300 V	Unit Nom. Power	0.9 kW AC

User's needs : Unlimited load (grid)

Grid-Connected System: Simulation parameters

Project :	**Newman WA**			
Geographical Site	**Nman**		**Country**	**Australia**
Situation	Latitude	23.3°S	Longitude	119.7°E
Time defined as	**Legal Time**	Time zone UT+8	Altitude	5 m
	Albedo	0.20		
Meteo data :	Nman RMY			

Simulation Variant :	**Simulation variant**	
	Simulation date	27/04/07 22h50

Simulation parameters

Collector Plane Orientation	Tilt	25°	Azimuth	0°
Horizon	Free Horizon			
Near Shadings	No Shadings			

PV Array Characteristics

PV module	Si-poly	Model	**BP 380**		
		Manufacturer	BP SOLAR		
Number of PV modules		In series	12 modules	In parallel	1 strings
Total number of PV modules		Nb. modules	12	Unit Nom. Power	80 Wp
Array global power		Nominal (STC)	**960 Wp**	At operating cond.	870 Wp (50°C)
Array operating characteristics (50°C)		U mpp	195 V	I mpp	4 A
Total area		Module area	**7.8 m²**		

PV Array loss factors

Heat Loss Factor	ko (const)	29.0 W/m²K	kv (wind)	0.0 W/m²K / m/s
=> Nominal Oper. Coll. Temp. (800 W/m², Tamb=20°C, wind 1 m/s)			NOCT	45 °C
Wiring Ohmic Loss	Global array res.	1463.1 mOhm	Loss Fraction	3.1 % at STC
Serie Diode Loss	Voltage Drop	0.7 V	Loss Fraction	0.3 % at STC
Module Quality Loss			Loss Fraction	3.0 %
Module Mismatch Losses			Loss Fraction	2.0 % at MPP
Incidence effect, ASHRAE parametrization	IAM =	1-bo (1/cos i - 1)	bo Parameter	0.05

System Parameter	System type	**Grid-Connected System**		
Inverter	Model	**Sunny Boy SWR 850 E**		
	Manufacturer	SMA		
Inverter Characteristics	Operating Voltage	150-300 V	Unit Nom. Power	0.9 kW AC

User's needs : Unlimited load (grid)

Grid-Connected System: Simulation parameters

Project :	**Meeka**			
Geographical Site	**Meekatharra**		**Country**	**Australia**
Situation	Latitude	26.6°S	Longitude	118.5°E
Time defined as	**Legal Time**	Time zone UT+8	Altitude	5 m
	Albedo	0.20		
Meteo data :	Meekatharra			

Simulation Variant :	**Simulation variant**	
Simulation date	27/04/07 22h20	

Simulation parameters

Collector Plane Orientation	Tilt	25°	Azimuth	90°
Horizon	Free Horizon			
Near Shadings	No Shadings			

PV Array Characteristics

PV module	Si-poly	Model	**BP 380**		
		Manufacturer	BP SOLAR		
Number of PV modules		In series	12 modules	In parallel	1 strings
Total number of PV modules		Nb. modules	12	Unit Nom. Power	80 Wp
Array global power		Nominal (STC)	**960 Wp**	At operating cond.	870 Wp (50°C)
Array operating characteristics (50°C)		U mpp	195 V	I mpp	4 A
Total area		Module area	**7.8 m²**		

PV Array loss factors

Heat Loss Factor	ko (const)	29.0 W/m²K	kv (wind)	0.0 W/m²K / m/s
=> Nominal Oper. Coll. Temp. (800 W/m², Tamb=20°C, wind 1 m/s)			NOCT	45 °C
Wiring Ohmic Loss	Global array res.	1431.8 mOhm	Loss Fraction	3.0 % at STC
Serie Diode Loss	Voltage Drop	0.7 V	Loss Fraction	0.3 % at STC
Module Quality Loss			Loss Fraction	3.0 %
Module Mismatch Losses			Loss Fraction	2.0 % at MPP
Incidence effect, ASHRAE parametrization	IAM =	1-bo (1/cos i - 1)	bo Parameter	0.05

System Parameter	System type	**Grid-Connected System**		
Inverter	Model	**Sunny Boy SWR 850 E**		
	Manufacturer	SMA		
Inverter Characteristics	Operating Voltage	150-300 V	Unit Nom. Power	0.9 kW AC

User's needs : Unlimited load (grid)

Grid-Connected System: Simulation parameters

Project :	**Port Hedland RMY**			
Geographical Site	**Port Hedland**		**Country**	**Australia**
Situation	Latitude	20.3°S	Longitude	118.6°E
Time defined as	**Legal Time**	Time zone UT+8	Altitude	5 m
	Albedo	0.20		
Meteo data :	Port Hedland			

Simulation Variant :	**Simulation variant**	
	Simulation date	27/04/07 22h26

Simulation parameters

Collector Plane Orientation	Tilt	25°	Azimuth	0°
Horizon	Free Horizon			
Near Shadings	No Shadings			

PV Array Characteristics

PV module	Si-poly	Model	**BP 380**		
		Manufacturer	BP SOLAR		
Number of PV modules		In series	12 modules	In parallel	1 strings
Total number of PV modules		Nb. modules	12	Unit Nom. Power	80 Wp
Array global power		Nominal (STC)	**960 Wp**	At operating cond.	870 Wp (50°C)
Array operating characteristics (50°C)		U mpp	195 V	I mpp	4 A
Total area		Module area	**7.8 m²**		

PV Array loss factors

Heat Loss Factor	ko (const)	29.0 W/m²K	kv (wind)	0.0 W/m²K / m/s
=> Nominal Oper. Coll. Temp. (800 W/m², Tamb=20°C, wind 1 m/s)			NOCT	45 °C
Wiring Ohmic Loss	Global array res.	1463.1 mOhm	Loss Fraction	3.1 % at STC
Serie Diode Loss	Voltage Drop	0.7 V	Loss Fraction	0.3 % at STC
Module Quality Loss			Loss Fraction	3.0 %
Module Mismatch Losses			Loss Fraction	2.0 % at MPP
Incidence effect, ASHRAE parametrization	IAM =	1-bo (1/cos i - 1)	bo Parameter	0.05

System Parameter	System type	**Grid-Connected System**		
Inverter	Model	**Sunny Boy SWR 850 E**		
	Manufacturer	SMA		
Inverter Characteristics	Operating Voltage	150-300 V	Unit Nom. Power	0.9 kW AC

User's needs : Unlimited load (grid)