Example of a phase 1 scoping for a client based in Central America

Model for a Generic Micro, and a 1.36kW BTS, both including secondary load allowance for heat exchanger and battery cooling.

Summary

			Generic Micro	1.36kW BTS
3kW PV Array			✓	✓
Proven 6kW Wind Turbine			✓	✓
24 2500Ah Batteries			✓	✓
10kw Generator			✓	✓
AC Primary load		kWh/yr	8,687	10.439
DC Primary Load		kWh/yr	5,300	13,980
	Total	kWh/yr	13,987	24,419
PV Output		kWh/yr	5,328	5,328
			30%	18%
Wind Turbine		kWh/yr	8,251	8,251
			46%	28%
Generator		kWh/yr	4,262	15,799
			24%	54%
	Total		100%	100%
Generator				
Hrs of operation		hr/yr	618	1,645
No of starts			44	148
Annual fuel usage		l/yr	1,560	5,266

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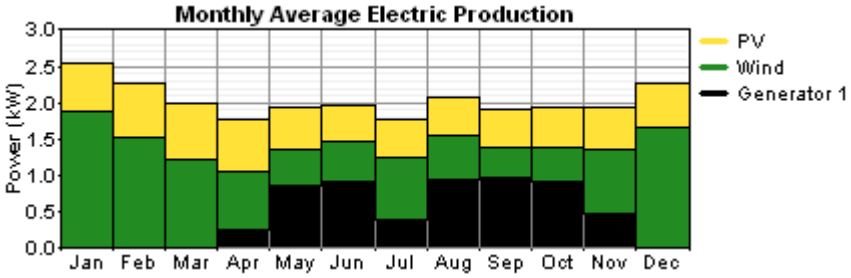
System Report - Generic Micro

System architecture

PV Array:	3 kW
Wind turbine:	1 Proven 6kW DC
Generator 1:	10 kW
Battery:	24 Hoppecke 20 OPzS 2500
Inverter:	5 kW
Rectifier:	5 kW

Dispatch strategy: Cycle Charging

Annual electric energy production



Component	Production (kWh/yr)	Fraction
PV array	5,328	30%
Wind turbine	8,251	46%
Generator 1	4,262	24%
Total	17,841	100%

Annual electric energy consumption

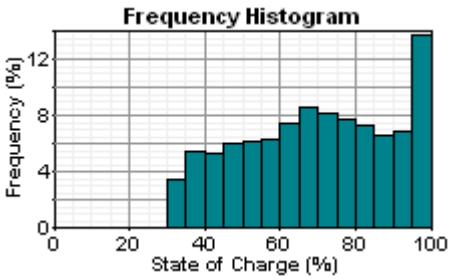
Load	Consumption (kWh/yr)	Fraction
AC primary load	8,687	62%
DC primary load	5,300	38%
Total	13,987	100%

Variable	Value	Units
Renewable fraction:	0.761	
Excess electricity:	1,474	kWh/yr
Unmet load:	0	kWh/yr
Capacity shortage:	0	kWh/yr

PV

Variable	Value	Units
Average output:	14.60	kWh/d
Minimum output:	0.0001130	kW
Maximum output:	3.31	kW
Solar penetration:	38.1	%
Capacity factor:	20.3	%
Hours of operation:	4,722	hr/yr

Battery state of charge



Generator 1

Variable	Value	Units
Hours of operation:	618	hr/yr
Number of starts:	44	starts/yr
Operational life:	24.3	yr
Average electrical output:	6.90	kW
Minimum electrical output:	6.17	kW
Maximum electrical output:	7.62	kW
Annual fuel usage:	1,560	L/yr
Specific fuel usage:	0.366	L/kWh
Average electrical efficiency:	27.8	%

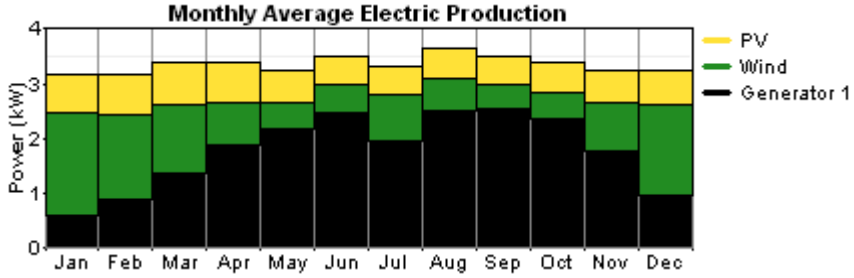
System Report – 1.36kW BTS

System architecture

PV Array:	3 kW
Wind turbine:	1 Proven 6kW DC
Generator 1:	10 kW
Battery:	24 Hoppecke 20 OPzS 2500
Inverter:	10 kW
Rectifier:	10 kW

Dispatch strategy: Cycle Charging

Annual electric energy production



Component	Production (kWh/yr)	Fraction
PV array	5,328	18%
Wind turbine	8,251	28%
Generator 1	15,799	54%
Total	29,378	100%

Annual electric energy consumption

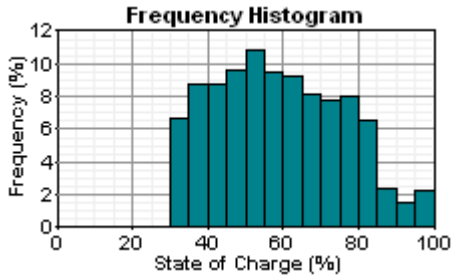
Load	Consumption (kWh/yr)	Fraction
AC primary load	10,439	43%
DC primary load	13,980	57%
Total	24,419	100%

Variable	Value	Units
Renewable fraction:	0.462	
Excess electricity:	178	kWh/yr
Unmet load:	0	kWh/yr
Capacity shortage:	0	kWh/yr

PV

Variable	Value	Units
Average output:	14.60	kWh/d
Minimum output:	0.0001130	kW
Maximum output:	3.31	kW
Solar penetration:	21.8	%
Capacity factor:	20.3	%
Hours of operation:	4,722	hr/yr

Battery state of charge



Generator 1

Variable	Value	Units
Hours of operation:	1,645	hr/yr
Number of starts:	148	starts/yr
Operational life:	9.12	yr
Average electrical output:	9.60	kW
Minimum electrical output:	3.00	kW
Maximum electrical output:	10.00	kW
Annual fuel usage:	5,266	L/yr
Specific fuel usage:	0.333	L/kWh
Average electrical efficiency:	30.5	%