

# Electrical Budget Worksheet for Alchera

1 Calculate your DC Loads:

Lighting	Amps	Hours	AH/Day
Running Lights	4.6		0.0
Masthead Tricolor Light	2.2	9	19.8
Anchor Light	1.8		0.0
Strobe Light	0.6	2	1.2
Foredeck Light	1.4	0.1	0.1
Cabin Light (small)	0.3	9	2.7
Cabin Light (big)	0.7	2	1.4
Steaming Light	0.8		0.0
Instrument Lights	0.3	9	2.3
Other			0.0
<b>Lighting AH</b>			<b>27.5</b>

Galley	Amps	Hours	AH/Day
Refrigeration	4.7	6	28.2
Prop Solenoid	0.5	0.5	0.3
Other			0.0
<b>Galley AH</b>			<b>28.5</b>

Electronics	Amps	Hours	AH/Day
Autopilot	4.5	24	108.0
VHF (receive)	0.1	24	2.4
VHF (transmit)	7.0	0.03	0.2
SSB (receive)	1.8	2	3.6
SSB (transmit)	27.0	0.08	2.2
SSB Digital controller			0.0
GPS	0.2	24	4.8
Instruments	2.0	24	48.0
Weather fax receiver			0.0
Radar (standby)	1.8	20	36.0
Radar (transmit)	4.0	4	16.0
AIS	0.2	24	4.8
Energy Monitors			0.0
Stereo	0.5		0.0
Computer (screen off)	0.8	20	16.0
Computer (screen on)	1.3	4	5.2
Computer (serial adapter)			0.0
Iridium	0.5	0.25	0.1
<b>Electronics AH</b>			<b>247.3</b>

Plumbing	Amps	Hours	AH/Day
Fresh Water Pump	6.3	0.05	0.3
Bilge Pump(s)	5.0		0.0
Other			0.0
<b>Plumbing AH</b>			<b>0.3</b>

Calculate using average water consumption.  
This should be zero unless the boat leaks.

Inverter	Amps	Hrs/day	AH/Day
Microwave	70.0	0.17	11.9
Chargers (nicad)			0.0
Other			0.0
<b>Inverter AH</b>			<b>11.9</b>

All values assume inverter efficiency = 85%.  
Power factor may mess up this estimate.

**Gross Energy Consumption AH/Day** **315.5**

2 Alternative Energy Sources	Device	Amps	Hrs/day	AH/day
	Solar, avg	5.0	9	45.0
	Wind, avg		18	0.0
	Water, avg.			0.0
	<b>Contribution of AES AH/Day</b>			<b>45.0</b>

Assumes one large panel.  
Assumes AIR Marine wind turbine in good location.

**3 Net Energy Consumption, AH/Day** **270.5**

**4 Desired Hours Between Charging** **12**

**5 Range of Battery Use** **0.50**

For example, from 50-85% state of charge.

**6 Recommended Battery Capacity** **270**

**7 Alternator Output, Amps** **90**

Target would be 25% flooded, 40% gel, of capacity.

**8 Charge Efficiency Factor** **0.85**

Gels = 95%, flooded cells = 85%

**9 Minimum Minutes to Charge** **106**

Assumes alternator runs at full output.