

**ENERGY BALANCE**

**SUSTAINABLE YACHT 'Ya'**

weekend= 1 day upwind, 1 night anchor/harbour, 1 dag downwind,+

	Energy Balance when sailing an average day at sea					Energy Balance when on anchor or in harbour					Energy balance in 1 weekend (1 day upwind, 1 night still, 1 day downwind)				
<i>12&amp;48 V DC using equipment</i>	#	Watt	hr/day	kWh/day	Remarks	#	Watt	hr/day	kWh/day	Remarks	#	Watt	hr/wk	kWh/day	Remarks
Navigatie- en dekverlichting	1	2,5	8	-0,02	3colourlt or 1 anchorlt, 2 spots 1W	1	2,5	6	-0,02	3kl.licht of 1W ankerlicht, 2 spots 1W	1	5	8	-0,04	ankerlicht
Navigatie- en communicatieap	4	16,2	4	-0,26	laptop15W, VHF 5W, GPS 1W, SSB	1	10	1	-0,01	VHF 5W, laptop20W	4	30	8	-0,96	laptop20W, VHF 5W, Bbradar 2W, GPS 5
Interior lights	2	5	3	-0,03	all LED	3	6	3	-0,05	alles LED	4	5	6	-0,12	alles LED
Water-, shower-, toilet- en bilgep	1	150	0	0,00	1 waterpump, 1 bilge pump	1	150	0,3	-0,05	1 waterpump, 1 bilge pump	1	150	0,6	-0,09	1 waterpump, 1 bilge pump
Watermaker	0	300	1	0,00	not on board (not necessary)	0	300	2	0,00	not on board (not necessary)	1	300	0	0,00	not on board (not necessary)
Electric winless	1	1000	0,1	-0,10	only when anchoring up	1	1000	0	0,00	only when anchoring up	1	1000	0,1	-0,10	only when anchoring up
Fridge/freezer combination	1	40	8	-0,32	Very well insulated	1	100	4	-0,40	Very well insulated	1	100	20	-2,00	Very well insulated
waterkoker 48V (80% efficiency)	1	400	1,2	-0,48	4 ltr water (coffee,tea,soup)	1	400	0,6	-0,24	4 ltr water (coffee,tea,soup)	1	400	1,2	-0,48	8 ltr water (coffee,tea,soup)
Laptop	1	30	3	-0,09	1 hr charging Macbook 13"	1	30	3	-0,09	1 hr charging Macbook 13"	1	12,5	14	-0,18	1 hr charging Macbook 13"
Audio system	1	40	1	-0,04	iPod of iPhone met boxsetje	1	40	1	-0,04	iPod of iPhone met boxsetje	1	10	4	-0,04	iPod of iPhone met boxsetje
2 engines 6,5 kW	2	1500	1,5	-4,50	average use 1,5 hour a day	2	1500	0	0,00	average use 1,5 hour a day	2	1500	7	-21,00	1 day upwind = 6 hours use
loss by charging and storage				-1,17	20% loss, because half of the use is not during charging				-0,09	small loss of 10%, because most usage is during charging				-2,50	less loss 20%, because most usage is during charging
<i>AC using equipment</i>															
Kitchen equipment	1	200	0,1	-0,02	blender or mixer	1	200	0,1	-0,02	blender or mixer	1	200	0,2	-0,04	blender, mixer
Magnetron/oven	1	1000	0,3	-0,30	6X3minutes one heats something	1	1000	0,2	-0,20	6X3minutes one heats something	1	1000	0,15	-0,15	1X heating 1 meal
Induction cooker	2	1500	0,3	-0,90	simple meal, use of hay box	3	1500	0,4	-1,80	more extensive meal, use of hay box	2	1500	0,5	-1,50	simple meal
loss by charging and storage				-0,24	10% loss because most usage is during charging				-0,40	10% loss because most usage is during charging				-0,68	small loss 10%, because most usage is during charging
loss by converting				-0,29	20% loss because converting to higher voltage				-0,48	20% loss because converting to higher voltage				-0,47	20% verlies because converting to higher voltage
10% diverse and small losses				-0,88	due to wrong use, unnecessary use				-0,39	due to wrong use, unnecessary use				-2,92	due to wrong use, unnecessary use
<b>Total DC en AC users</b>				<b>-9,64</b>					<b>-4,28</b>					<b>-33,26</b>	
<i>generation during 7 days (1 week)</i>															
<i>Generation</i>	#	Watt	hr/day	kWh/day		#	Watt	hr/day	kWh/day					kWh/wk (let op: kWh per week)	
Windmill 400 Wp	1	150	20	3,00	this is an average; upwind is triple	1	50	24	1,20	more in windstill area	1	30	168	5,04	harbour is in windstill area
4,8m2 Solar bimini 3*230Wp	3	216	6	3,89	30% of Wp during 6 hours	3	216	6	3,89	30% of Wp during 6 hours	3	92	35	9,66	30% van de Wp gedurende 5 uur per dag
3,6 m2 Solar deck 440 Wp	3	88	5	1,32	less power due to heat and shadow	2	42,5	5	0,43	less power due to heat and shadow	2	42,5	21	1,79	less power due to heat and shadow
2X 1,2 m2 solar windows 2X60W	6	18	2	0,22	2 hrs morning+evening op 30% Wp	6	36	2	0,43	2 hrs morning+evening op 30% Wp	6	36	3	0,65	2 hrs morning+evening op 30% Wp, 50%
2 schroef(as)dynamo 800Wp	2	100	20	4,00	On 5 knots 100 Watt each	2	100	0	0,00	no speed	2	100	3	0,60	on 1 day 3 hrs sailing 5 knots
<b>Total Generation</b>				<b>12,42</b>					<b>5,95</b>					<b>17,73</b>	
<b>Balance</b>				<b>2,78</b>					<b>1,66</b>					<b>-15,53</b>	

-5 extra days for generation (no use)  
**nwind**

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r voltage

3

6 shadow