

heat losses

part of surface	u-value W/m2k	length	width	total area m2	heat loss W/1°C	inside day temp.	inside night temp	outsude temp. day	outside night temp.	average temp	heat loss day	heat loss night	heat loss average	
transparent Fassade 3 membrane layers CO2 vacuum	0,45	6,00	50,00	300,00	135,00	20,00	15,00	5,00	-51,00	-23,00	2.025,00	8.910,00	131,22	kwh
ceiling sand average 3 meters	0,22													
ceiling foam 3cm	0,90													
ceiling double membrane	2,8													
	0,17	9,00	50,00	450,00	74,83	20,00	15,00	-23,00	-23,00	-23,00	3.217,65	2.843,50	72,73	
floor sand 3 meters	0,22													
floor foam 3cm	0,90													
floor double membrane	2,80													
	0,17	9,00	50,00	450,00	74,83	20,00	15,00	-23,00	-23,00	-23,00	3.217,65	2.843,50	72,73	
total				1.200,00	284,66						8.460,30	14.597,01	276,69	kwh day

solar gains

solar Radiation in mars orbit	590,00	W/m2												
solar radiation arriving through atmosphere	531,00	90%												
projected mirror area in winter and summer	530,00	m2												
projected mirror area in spring and autumn	596,00	m2												
average projected mrror area over year	563,00	m2												
transmission trough membranes	0,70	70%												
sunshine hours/day	6,00													
gains per day	1.255,60	kwh												
no dust storm	100,00	%	1.255,60	KWH average gains per day										
soil heat storage	0,50	kwh per m3 and c°												
volume soil	900,00	m3		450,00	kwh /c	6.750,00	kwh	total storage						
	15,00	C° temp diff		24,40	days									

