

EcoSol

Standard Consulting with Simplified Input Form

02.04.2006

Calculation of energy consume and costs of energy production. The energy supply system contains collectors, solar cells and an additional heating.

Name; First name	Peschke, Christoph
Address	Ernststraße, 53
Postal code; town	53757, Sankt Augustin
Country	D
Telephone	02241 234446
Fax	02241 234447
Email	chpeschke@aol.com
Location of building:	53757 Sankt Augustin
Customer no.	1

Projekt EcoSol
Ernststraße 53
53757 Sankt Augustin
Tel. 02241 234446
Fax 02241 234447
Email: ErgoSolar@aol.com
Web: www.economic-solar-energy.de

System types

The system types are simulated according to the choices in the following table.

	<u>End reservoir/ Intermediate coupling/ Intermediate coupling with air heat exchanger</u>	<u>Gas heating/ Earth collector</u>	<u>Standard- collector/ Vacuum tube collector</u>	<u>Only collectors / Solar cells</u>	<u>Usage water cold/ Heat recovery</u>
System 1	E	G	S	S	U
System 2	E	G	V	S	H
System 3	A	G	S	S	U
System 4	A	G	S	S	H
System 5	A	G	V	S	H

Contents

1.	Energy consume as function of collector area	3
2.	Required area for solar cells.....	4
2.1.	Area for generation of electrical consume	4
2.1.1.	System 1/System 3	4
2.2.	Total area for zero energy house	4
2.2.1.	System 1/System 3	4
3.	Costs	5
3.1.	System 1	5
3.1.1.	System 1, collectors only	5
3.1.2.	System 1 with cells.....	5
3.2.	System 3	6
3.2.1.	System 3, collectors only	6
3.2.2.	System 3 with cells.....	6
4.	Costs for cells	7
5.	Required heating power	8
6.	Complete consulting.....	8

1. Energy consume as function of collector area

The graphs show the additional local energy consume for heating and usage water as function of the installed collector area.

1. System with end reservoir coupling, standard collector
(Data set u-h-EJEG_MAVN-D_st0.dat)
2. System with end reservoir coupling, Vacuum tube collector, heat recovery
(Data set u-h-EJEG-WW_MAVN-D_st0-r.dat)
3. System with intermediate coupling and air heat exchanger
(u-h-ZJEG-L_MAVN-D-L-st0.dat)
4. System with intermediate coupling, air heat exchanger, heat recovery
(u-h-ZJEG-L-WW_MAVN-D-L-st0.dat)
5. System with intermediate coupling, air heat exchanger, heat recovery, vacuum tube collectors
(u-h-ZJEG-L-WW_MAVN-D-L-st0-r.dat)

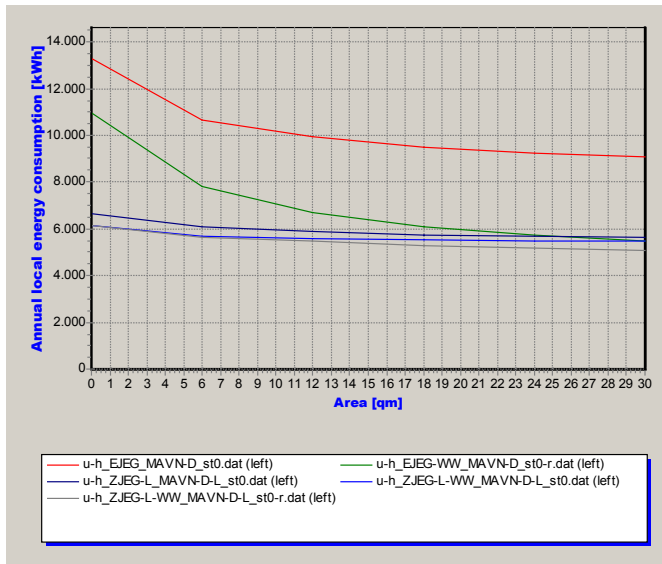


Figure 1

Additional parameters to input form:

Efficiency of vacuum tube collectors:

$$\alpha := 0.8$$

$$\beta := 0.46$$

Relative pumping energies

$$0.03 \text{ W/(kg/h)}$$

2. Required area for solar cells

2.1. Area for generation of electrical consume

The graph shows the area of solar cells required for the annual consume of electrical energy.

2.1.1. System 1/System 3

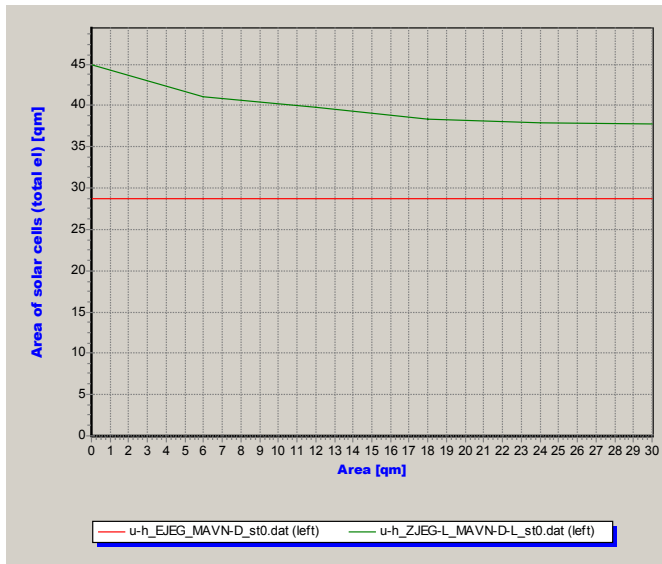


Figure 2

2.2. Total area for zero energy house

The graph shows the area of solar cells and solar collectors required for the total annual energy consume.

2.2.1. System 1/System 3

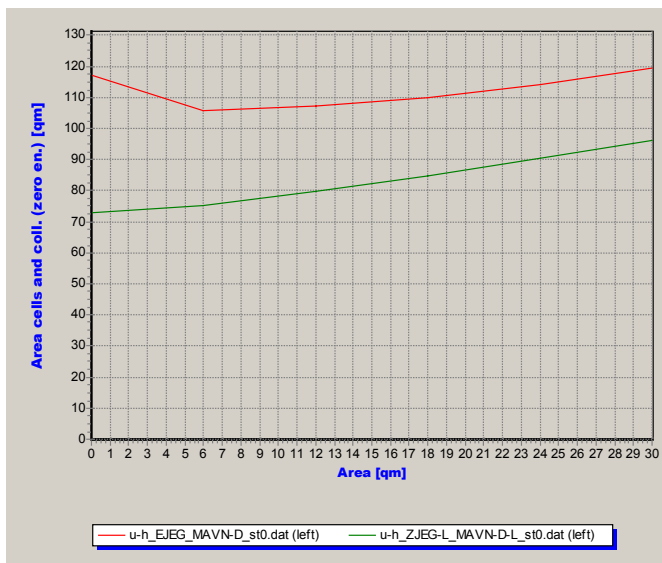


Figure 3

3. Costs

The annual costs for the energy system including credit payment and energy consume. The cell area is the area required for the electrical consume. Electrical energy surplus is sold to the energy supplier. The required energy is bought to market prices.

3.1. System 1

3.1.1. System 1, collectors only

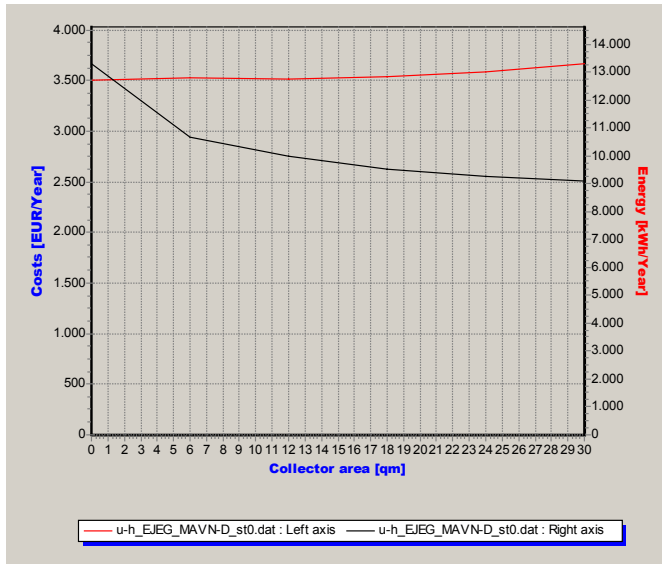


Figure 4

3.1.2. System 1 with cells

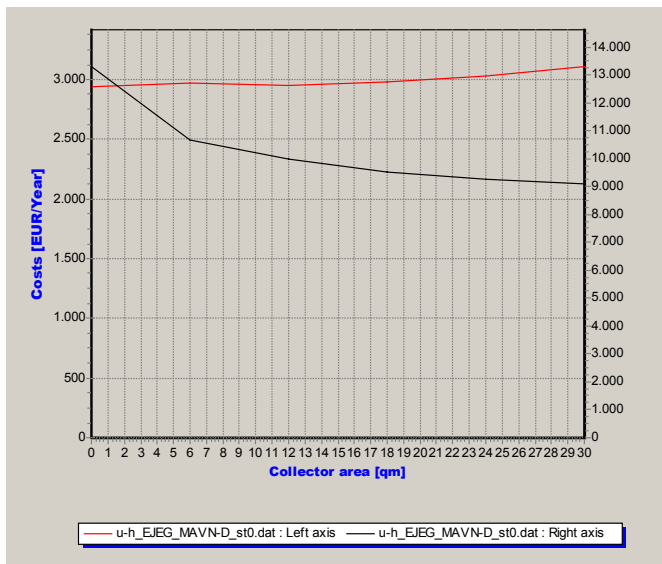


Figure 5

3.2. System 3

3.2.1. System 3, collectors only

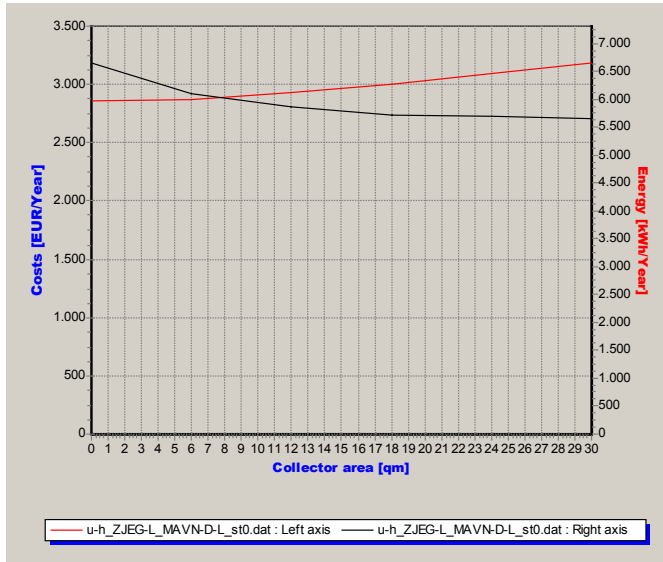
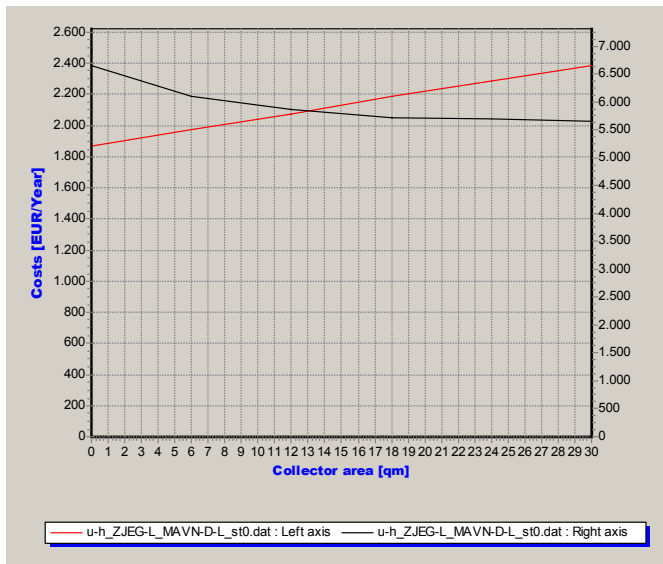


Figure 6

System with intermediate coupling, air heat exchanger, heat recovery

3.2.2. System 3 with cells



With surplus refunding

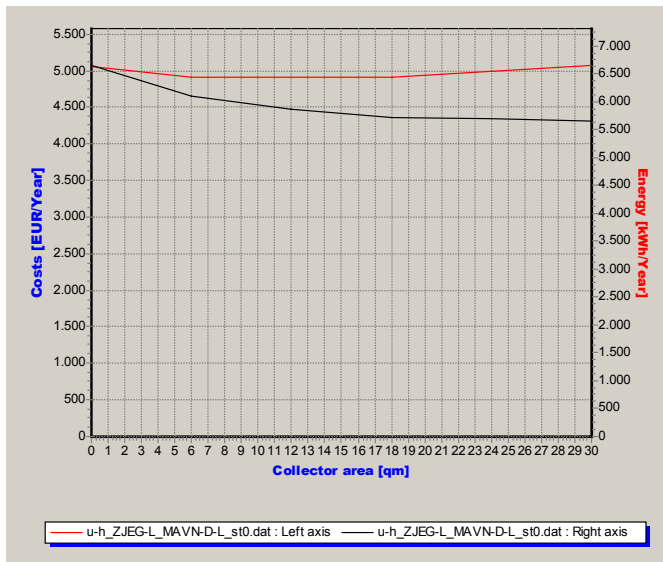


Figure 7

Without surplus refunding

Additional parameters to input form:

Costs for intermediate heat pump: 1.000 €

Costs for air heat exchanger: 1.000 €

4. Costs for cells

The figure shows the costs (profit) of a purely photovoltaic system with surplus funding.

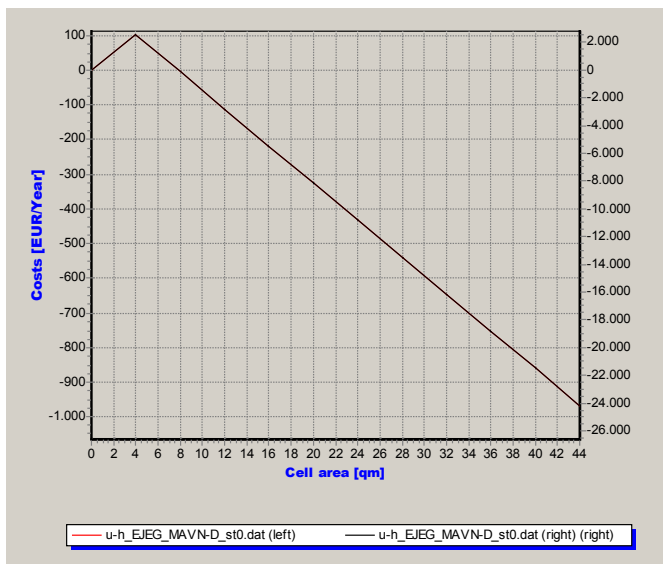


Figure 9

Profit at the end of repayment of system (25 years). Of the yearly repayment rates, the refunding is subtracted.

5. Required heating power

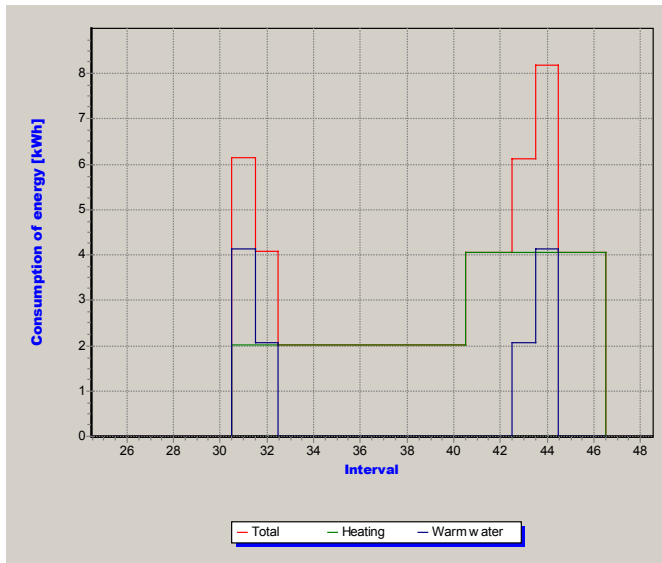


Bild 10: Energy consume (February, 2. day)

The relative consume per interval (1 h) is set to the relations shown in a standard consulting.

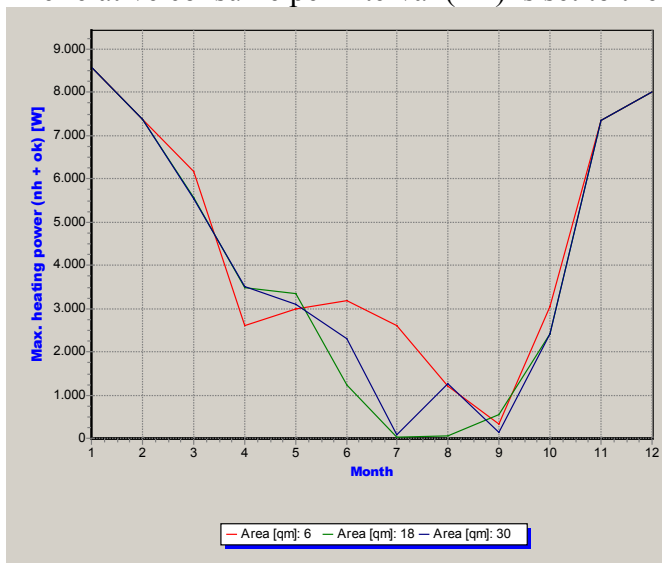


Figure 11 Additional heating power

Required total maximum additional heating power for different collector areas, system 3.

6. Complete consulting

Further consulting services are shown on the internet page of EcoSol:

www.economic-solar-energy.de

- The energy consume is calculated based on a detailed complete system and consume description.
- The results are presented as files.
- Costs can be calculated for various prices and system variations.