NOVI SAD ECOLOGY MOVEMENT

SOLAR SOD HOUSE – YOUR SWEET, WARM HOME

Veljko Milkovic's Self-Heating Eco-House Concept

- Financial and Energy Savings Calculation Report -

Solar sod house is in its basic purpose similar to classic house. In almost anything else, it is essentially different, primarily because of completely new room heating concept – with direct sun rays. All the other specific features of this solar house have come from the principal demand for maximum use and preservation witholding of free sun heat. The result of this idea is its main feature. This house, in terms of position, has to be dug in and protected by soil. Also its only open side has to be oriented strictly towards south.

In order to have the maximum use of the sun for successful heating during entire winter, it is necessary to inhance sun energy more times, that comes in through simple windows. This has been successfully achieved with specially calculated upper and lower reflecting surfaces, that are built in above and under each window. The sun energy increase factor in the object is up to 2.5 times bigger.

Direct advantages of solar sod over classic house

1. COST EFFICIENCY: if the heating costs, during the winter season and air conditionning costs during summer are calculated in a 140 m2 two-storey residential sod and classical house of the same features with the same 5-centemeter thermal insolation, the results are the following:

   Annual energy consumption for additional heating of the sod: 4,000 kWh

   Annual energy consumption for the heating of the corresponding house: 20,000 kWh

   Annual consumption for air conditioning of the equivalent house in summer: 3,000 kWh
   (If we want to provide the same comfort as the solar sod offers in summer)

   Total difference of the energy spent is in favour of the sod: 19,000 kWh per year.

   The equivalent price of the energy saved in this way is, at current prices[1], about 2,500 DM[2] (1,250 euros) per year.

   This means that in the period of 40 years the solar sod will definetly save over 100,000 DM (50,000 euros), and in 60 years it will pay off!

[1] This report was written in 1994 and all the calculations were made for that year.
[2] Deutsche Mark - German mark

2. Solar sod does not need instalation of floor heating, therefore it needs no addditional rooms for a boiler or fuel. This saves more than 20,000 DM (10,000 euros).
3. Because of the orientation towards the sun, there is also a 30 % direct savings on electrical lightning. The sod will during its lifetime certainly save over 6,000 DM (3,000 euros) on lightning.
4. The surface of the solar sod facade represents only one tenth of the entire surface of a classical house. Therefore, costs of plastering and facade maintenance are only one tenth of the same costs of a classical house.
5. Because of its location in the ground, the sod, no matter how big it is, doesn't need no lightning rods nor the rain gutters for collecting rainwater from the roof. Money saved on this is certainly more than 2,000 DM (1,000 euros).
6. A significant advantage of the solar sod, that cannot be calculated, is definetly a great security in case of: earthquakes, storm winds and even wars. We should mention that the problem of noise and vibrations is successfully solved by building solar sods. A sod is a house where there is "no kosava (southeast wind), north wind, nor draught"!

Constructive advantages of a solar sod

1. The sod has no classical foundations, but it has a multi purpose foundation or base slab.
2. In comparaison to classical house, it doesn't have an expensive roof construction, but it has a single slab made of reinforced concrete, with a protective layer of soil.
3. The sod has no gutters, but it has a lawn on the house roof. Maintenance costs of the lawn can be compared to the costs of gutters' maintenance and replacement.
4. The costs of maintenance and replacement of reflective surfaces can be compared to the maintenance of heat exchangers and heating instalations in a classical house.
5. Building of one eave made of reinforced concrete, that is at the same time an upper reflective surface, is definitely cheaper than building 4 classical eaves on a classical house.
6. Lower reflective surfaces also have the role of a protective window shutter and their prices are much lower than those of classical blinds on a house.
7. Costs of buying a bigger piece of land for building, that a sod requires, can be compensated by income from the agriculture grown on the same land. For example: orchard, garden or a luxurious park-plant nursery around the sod.
8. Instead of a classical block or brick walls, the sod requires external walls to be made of reinforced concrete[3]. This is slower to build, more complicated, and it requires relatively expensive formwork for pouring the concrete. These higher building costs can be completely justified by lasting of a solar sod, which is 4 times longer than that of over a classical house.

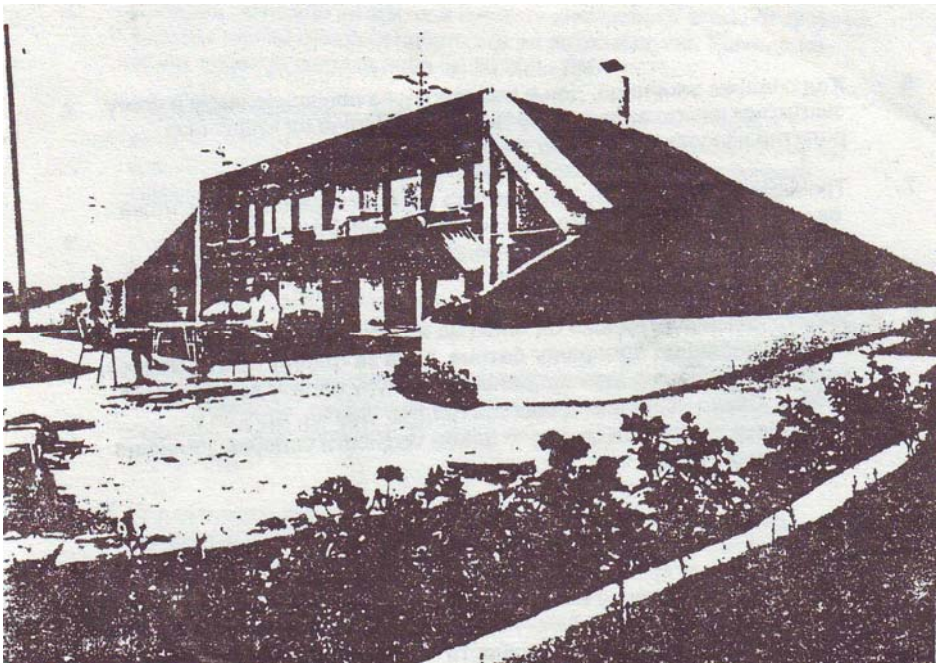
[3] Although the autor of this report made his house of concete, it is also possible to make solar sods of: bricks, wood, stone blocks…

Conclusion

All the mentioned characteristics of a solar sod, can be directly compensated with known flaws of every classical house. Based on previously presented advantages of the solar sod, it is clear to see that it is in every way more economical than any other house. Its 100% rentability, which is the result of savings on heating in period of 60 years, should be especialy highlighted. This means that a solar sod will, during its estimated lifetime of 300 years, pay off up to 5 times, which puts her at the top world inventions.

In Novi Sad,
December 05, 1994

Aleksandar Nikolic
Novi Sad, Serbia



Solar sod or self-heating ecological house (140m^2) near Novi Sad, Serbia.
http://www.veljkomilkovic.com/EkoKuca2Eng.html

Building of prefabricated ecological structures (residential, commercial and agricultural) with and without earth sheltering (earth protection) is in preparation.

Literature

1. Milkovic Veljko and Aleksandar Nikolic: ”Solar sod houses - the house of the future”, Novi Sad, Dnevnik, 1983

2. Milkovic Veljko: “Ecological houses”, “TIM-NT-90”; Novi Sad, 1991

3. Milkovic Veljko: "Sustainable life”, Novi Sad ecology movement, in preparation.