

## ***EDA-F 2.01***

Programm for the demonstration of the potential of energy saving  
by temporary using a poolcover for an outdoor pool

at the example of not translucent hollow section PVC-slats

licend for

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**grando GmbH pool covers**

Lizenz-Nr.: 0001.2.01.6.99

evolved by

**Fraunhofer-Institut für Bauphysik**

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Notes for using the programmes EDA-F or EDA-H:

- 1.) The programme EDA-F 2.0 (Energieeinsparpotentiale durch Abdeckungen-Freibad -potential of energy saving by using covers for outdoors pools) shows the balance of different energy streams which are in interchange with the surrounding,
- 2.) The accuracy of the calculation depends very much of the quality of the boundary condition as (measurements, temperature, abundance for freshwater supply). The user should take care of particularly those parameters, which could change because of timing or regional fluctuations, f.e. the temperature of the water. These circumstances could cause variations of some percentage. In case of doubt, it is recommended to repeat the calculation several times to see the influence of the instable value to the result.
- 3.) The calculation is basing on monthly average values of outside temperature, dewpoint temperature and monthly totals of solar irradiation in horizontal. Those parameters are according to TRY from the region around Würzburg / Germany. Those were listed in the registersheet climate-data. If the real climate-data are different to the assumed climate-data, this will have an effect on the quality of the calculation. The wind speed is very important, the user can choose between variable climate data or fixed values.
- 4.) With EDA only one pool, with or without cover, can be calculated. If there are many pools with only one summary energy value, every single pool has to be calculated with EDA and at the end, those values have to be accumulated. This has the advantage, that for every single pool different values like water temperature etc. are possible.
- 5.) The values, which were calculated by the programme, are not construed for heating, aeration or air conditioning. This investigation is basing upon the general conditions for the execution of research & development of the Fraunhofer organisation. Issues and dissemination to a third person are not allowed.

Fraunhofer-Institut für Bauphysik, Juni 1999

### Input for indoor pools

Bathing season  ▼

Assumption for air speeds near the ground  
 ▼

Pool water temperature **28** [°C] ◀ | ▶ **84'**  
 Fresh water temperature **10** [°C] ◀ | ▶ **50'**  
 add. fresh water supply **6** [l/m²d] ◀ | ▶  
 calc. min. supply of fresh water 11 [l/m²d] )

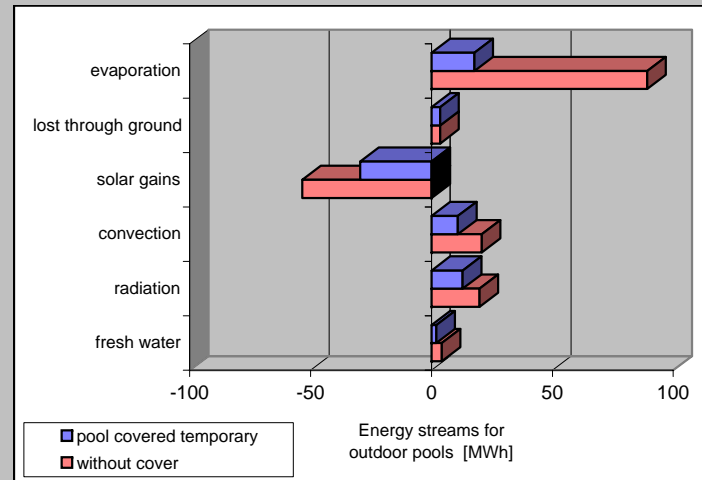
Lenght of pool **12.2** [m] ◀ | ▶ **40'**  
 Width of pool **6.1** [m] ◀ | ▶ **20'**  
 Deepness of pool **1.8** [m] ◀ | ▶ **4'**

Distance between poledge and cover  
 Distance inside **-3** [cm] ◀ | ▶  
 Distance outside **5** [cm] ◀ | ▶  
 Daily time without cover **4** [h/d] ◀ | ▶  
 (= daily bathing time)

Energy source (heating)  ▼

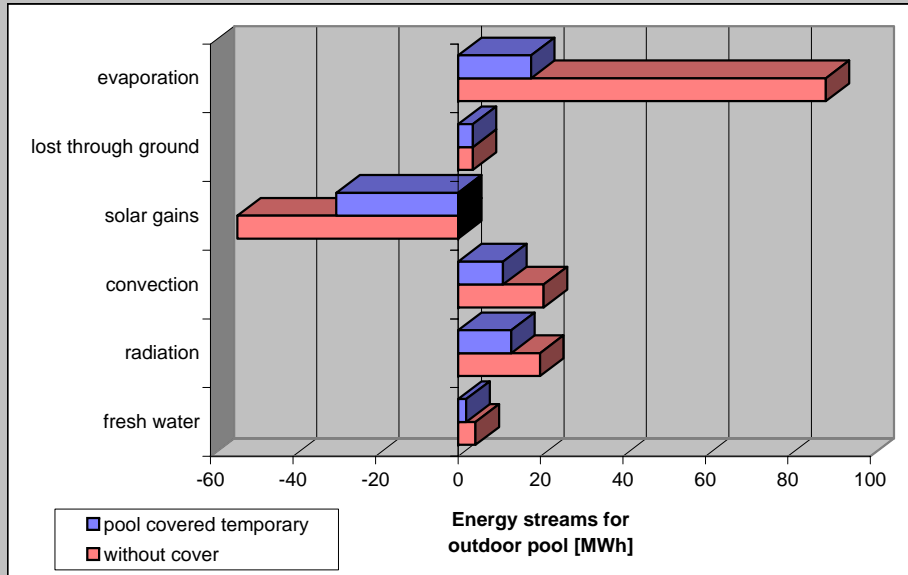
Energy price 03/2008 **8** [Cent/kWh] ◀ | ▶

### Energy balance - preview



Energy balance without cover	84,114 [kWh]
<b>Energy balance with cover at time</b>	<b>17,643 [kWh]</b>
Energy saving absolute	66,471 [kWh]
Energy saving in percentage	79 [%]
Saving of energycosts	6,256 [\$]

### Influence of the pool cover to the energy and costbalance of an outdoor pool.



Balance of energy streams		
	without cover	with cover temporary
evaporation	89,192	17,725
lost through ground	3,570	3,570
solar gains	-53,535	-29,513
convection	20,771	10,933
radiation	19,887	12,915
supply of fresh water	4,229	2,013
<b>Total</b>	<b>84,114</b>	<b>17,643</b>

<b>Saving during temporary covering</b>		<b>Period of balance</b>	<b>all-the-year</b>
<b>Energy saving</b>	<b>66,471 kWh</b>	<b>Daily closed pool</b>	<b>20 h</b>
<b>Cost savings</b>	<b>6,256 \$ that means 79.0%</b>	<b>Source of energy</b>	<b>natural gas 8 Cent/kWh</b>

Other boundry conditions, please see our input sheet



