SOLKAV

Alternative Energie Systeme GmbH

Solar absorber & heat pump technology

for indoor and outdoor swimming pools and hotels

Ice rinks

For sale and rent

SportSolar

Integration of solar absorbers into pool-side walkways, sports flooring, tennis courts

Solar absorber & heat pump technology

for outdoor and indoor swimming pools and hotels

ClassicSolar

SolarBooster/ heat pump

SportSolar

PremiumSolar

SOLKAV

We about us

Key data:

- Located at Pyhra near St. Pölten, Austria
- Operating Europe-wide with a focus on A,D,CH, Benelux, CEE (Bulgaria, Poland), Spain
- You can communicate with us in german; english; spanish, serbo-croatian; polish; russian; albanian
- 10,000 systems installed, including 150 large plants
- 35 employees
- Owned by: private investors and funds

Our mission:

Solar absorber and heat pump technology

- For home and commercial applications
- Rapid payback (even without subsidies)
- Reliable technology

  (Bitzer compressors; alva laval heat changers; Grundfos pumps; Siemens controller; etc.)
- For many years of continuous service

SOLKAV

We about us

Our vision:

Innovation is the source of any further development

- 1982: the first solar absorber in Europe (Wilhemsburg; Austria)
- 1985: the first ice rink employing absorber technology
- 1994: the first floor-integrated solar absorber (SportSolar)
- 2002: heat pump system combined with solar absorber technology
- 2004: the first full-scale solution for heating and air conditioning using solar absorber technology (Sofia)
- 2007: the first gas motor powered heat pump solution

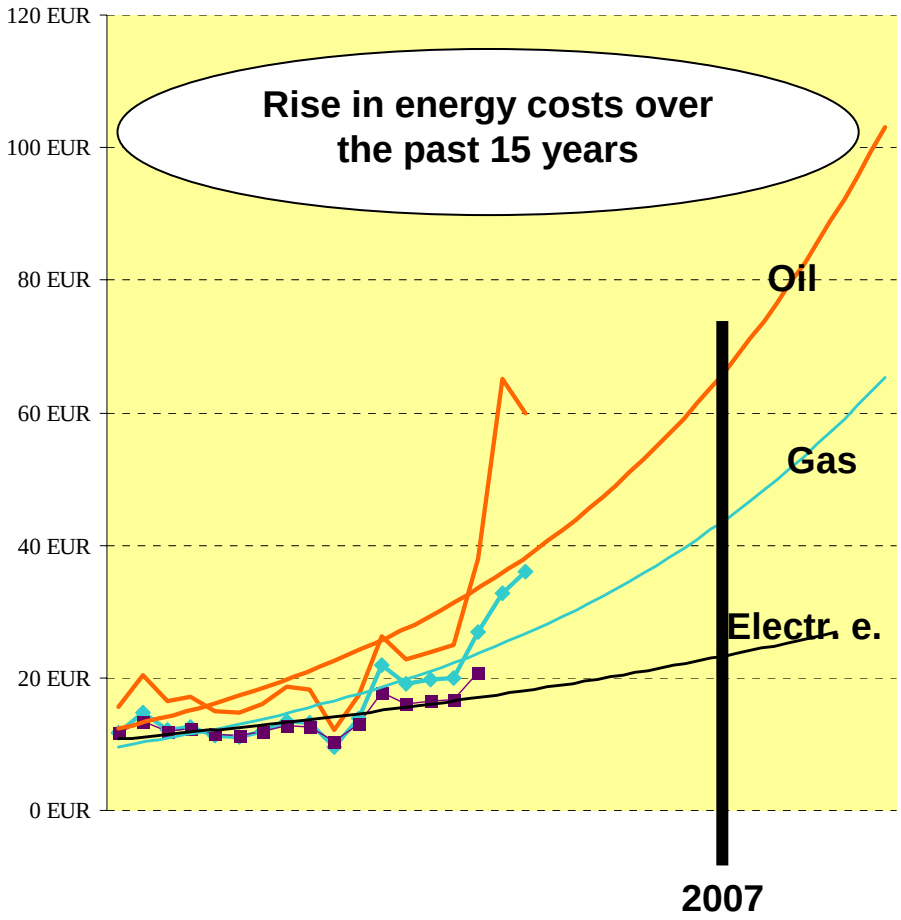
Patents:

Our company holds various patents

- SPORT SOLAR:
  - Integrated of the absorber a surface (as terrace; a pool-side walkway or as sports flooring)
- Absorber-Heat pump combinations:
  - Management of the permanent changing incoming absorber temperatures and the managed heat capacity
- Twinabsorber technique
  - Double circle absorber, which make two applications at the same time
- GAS Engine for a heat pump :
  - The usage of a gas engine for the heat pump in combination with solar (applied)

Development of energy costs

for outdoor and indoor pools and hotels



- On average, energy costs rose
  - by an annual 4.5% up to 2004;
  - by 2007, the annual average increase over the past 15 years has risen to **8.0 %**
- The **price of natural gas**, which is often of critical relevance for swimming pools,
  - has soared "**OPEC style**" due to Russia's rigorous pricing policy
- The price of **electrical energy** has risen over the long term
  - **by 4 %,**
  - and thus at about half the rate of fossil fuels

Energy costs per year

for outdoor and indoor swimming pools and hotels

- To heat **one m² of your outdoor swimming pool** to Ø + 23° - 24° during the season you require about **800 kWh** of fossil energy at a cost of **EUR 48 per m²***
- To heat **one m² of your indoor swimming pool** you require about **1,500 kWh** per year of fossil energy at a cost of **EUR 90 per m²** *
- **For one m³** of hot water about **35 kWh** or **EUR 2.1 per m³** *
- **Space Heating** including heat recovery costs you **about 250 kWh per m²** or **EUR 15 per m²**

* (e.g.: EUR 0.05 per kWh of gas at 85% energy efficiency or EUR 0.06 per KWh of district heat)

- For an outdoor swimming pool with
  - 1,000 m² pool area and
  - 2,000 m³ hot water
  - Your energy costs amount to:
    - ◇ **EUR 48,000 for the pool > (90%)**
    - ◇ EUR 4,200 for the hot water
- For an average indoor swimming pool with
  - 500 m² pool area and
  - 6,000 m³ hot water
  - 1,200 m² floor area
  - Your energy costs amount to
    - ◇ **EUR 45,000 for the pool > (60%)**
    - ◇ EUR 12,600 for hot water
    - ◇ EUR 18,000 for space heating

SOLKAV

In summer and in winter

You want

- warmer water in your outdoor or indoor swimming pool
- combined domestic hot water preparation and/or space heating
- combined air-conditioning
- to operate a (mobile) ice rink at low cost in winter
- to do all this on easy terms

Solkav offers you a variety of product solutions

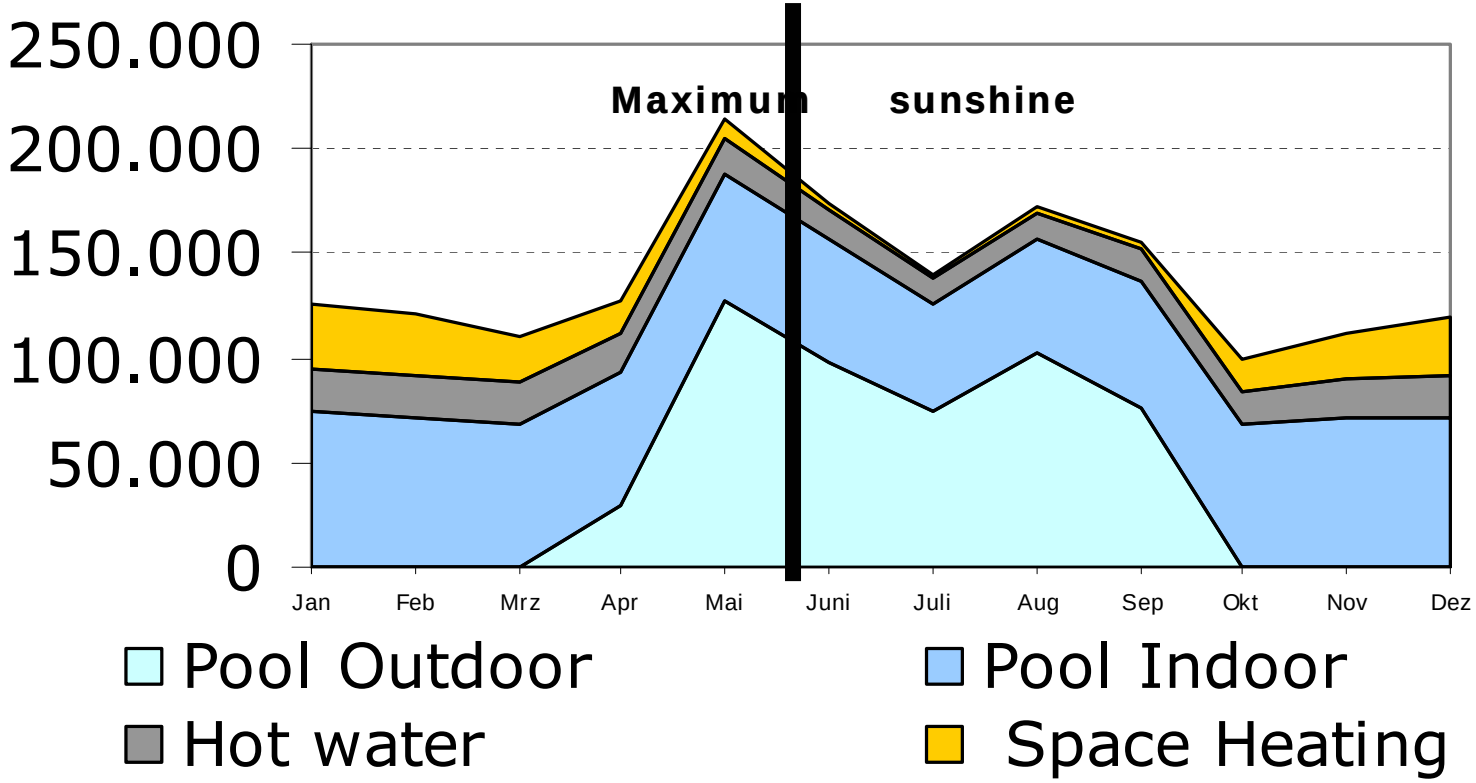
- **based on solar technology components**
- **if desired, in combination with heat pumps**
- **that use free solar energy for highly cost-efficient operation**

Solkav

An investment that pays off

Energy cost distribution

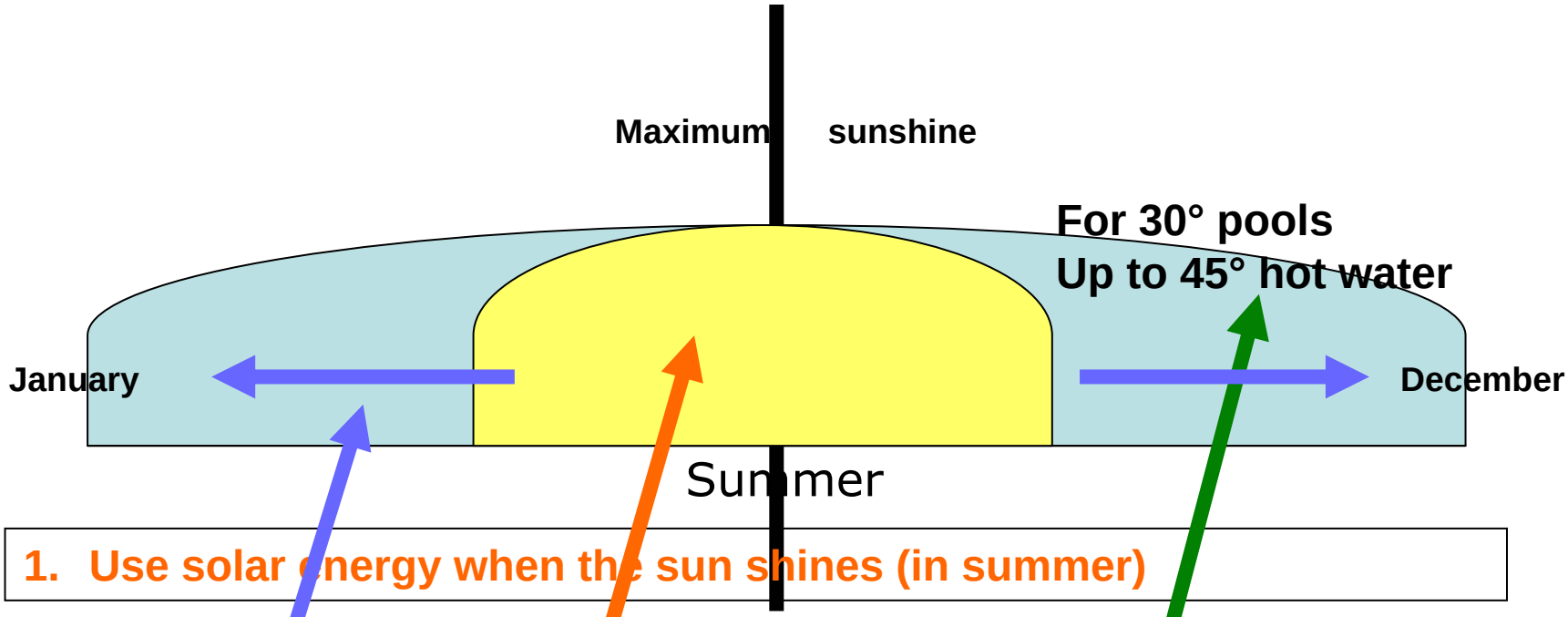
for outdoor and indoor swimming pools and hotels



Pools require heating either throughout the year or primarily in summer
(when the sun shines or temperatures are at least high)

The Solkav concept

for outdoor and indoor swimming pools and hotels



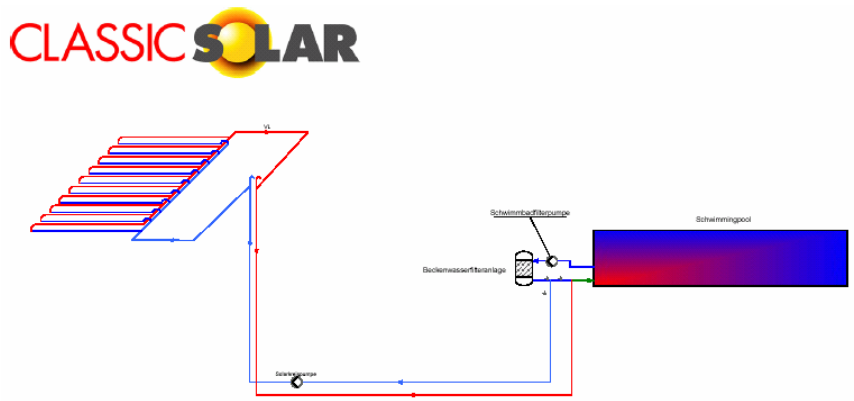
1. Use solar energy when the sun shines (in summer)

2. Efficient use of heat pump while the temperature is above freezing (> 330 days)

3. Low target temperatures that are efficiently attained by a heat pump 30° – 45°

Classic Solarabsorber

Operating principles

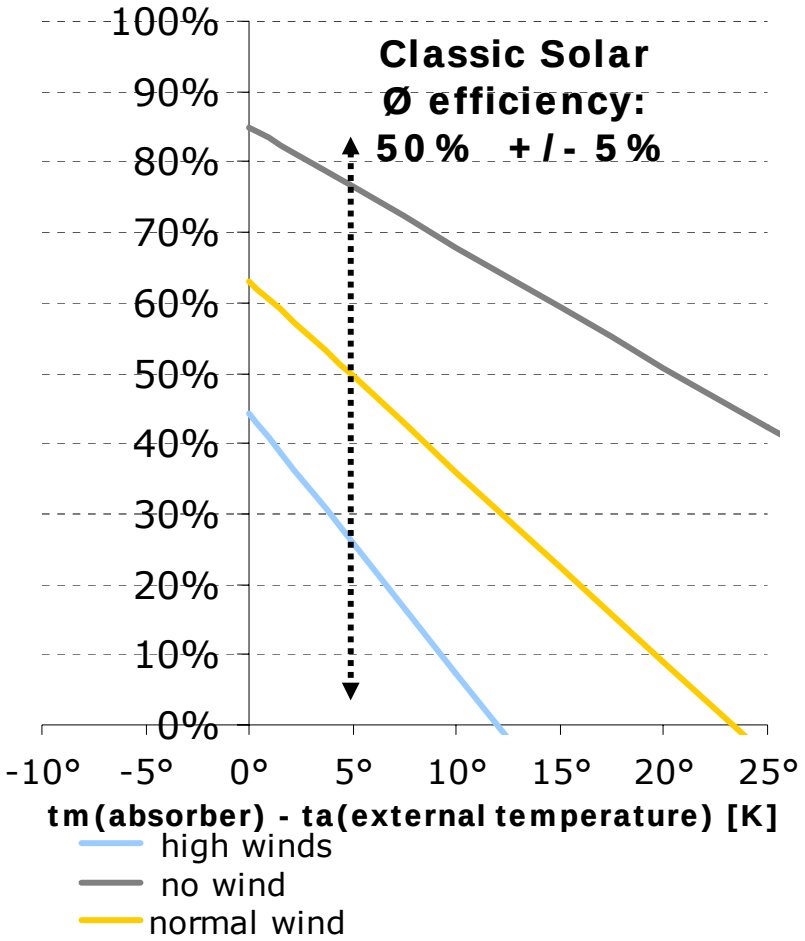


Pool water is circulated **directly through a roof-mounted system**

- While the water is circulating it is heated by solar energy – the optimal **temperature delta being approx. 3°C**
- With large volumes/pipe diameters, the solar energy gained is about equivalent to that captured with glazed collectors
- When the sun does not shine or the pool water is sufficiently warm, **the system shuts down automatically**

Classic solar absorber

Degree of efficiency

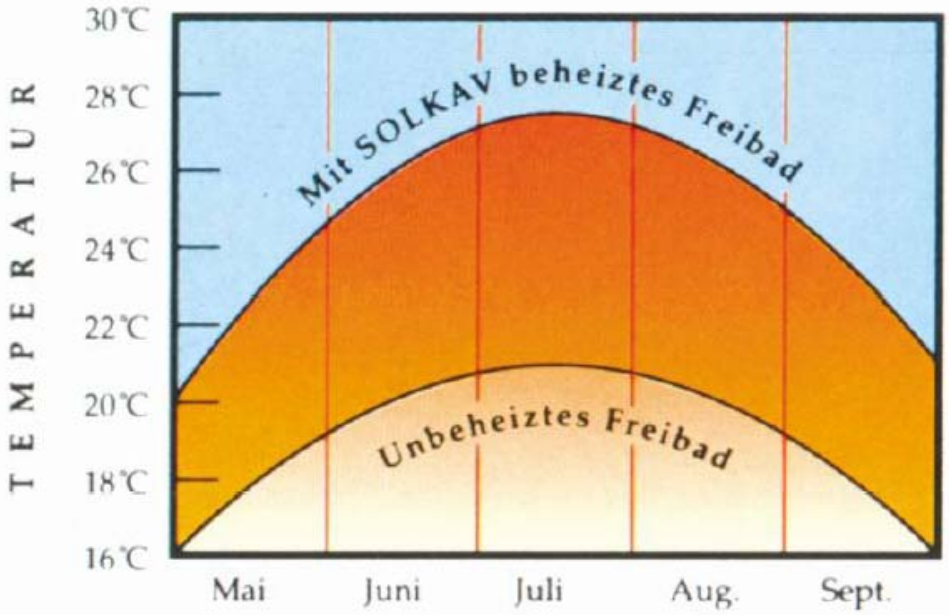


The Classic solar absorber is an **uncovered tube system** and therefore

- **less expensive** than glazed systems
- Because of the low circulation temperature in pool heating applications (about +5° above external temperature), **the impact of windy conditions is within a tolerable range**
- With an efficiency of about 85% in ideal conditions and an efficiency of about **50% +/-5%** in average operation a true **high performer**

Classic Solarabsorber

Results



With 100 % absorber area relativ to pool area

	Wind low	normal	high
Additional rise in temperature on a sunny day			
By day	**+ 5°C**	**+ 4°C**	**+ 3°C**
By night	**- 1,5°C**	**-2°C**	**- 3°C**
Increase in pool temperature (Ø)	**+ 5°C**	**+ 4°C**	**+ 3°C**
Additional pleasant bathing days	**60**	**-**	**80**

about 50 % effiency from solar radiation

♥ and this without energy costs

Classic solar absorber

Long-term durability

UV light. EPDM is 100% UV resistant. Unlike many types of plastics, it does not contain any plasticisers and therefore is not at risk of disintegrating in the course of time

Chlorine. Solkav uses high-quality EDPM (rubber) resistant in accordance with the German standard DIN 4060. (You may even use some extra chlorine. When using saline systems, a titanium intermediate heat exchanger is required)

Hail. Rubber is flexible and the Solkav absorber is especially thick-walled and sturdy.

Classic solar absorber

Martens, ravens & Co.

Martens, ravens >>
no problem

- You can easily repair the solar system in a matter of just 10 minutes yourself

or

- You can protect your system by means of a simple wire mesh which, if necessary, can also be installed later on

- PS: only about one in 200 systems is actually affected by problems of this kind

Classic solar absorber

Installation variants

Easy to install on any roof

- ◇ flat roof
- ◇ tiled roof
- ◇ Eternit (fibres and cement)
- ◇ seam roof

of any size (length x width)

Fastening:

- ◇ by bonding agent or
- ◇ by means of aluminium rails

Load on roof: 6 kg per m² + piping and fasteners on average not exceeding 15kg

Classic solar absorber

Cooling

Your solar system also comes with a **cooling feature**.

- If desired, the pool can be cooled down a little during the night
- This feature is of particular interest for swimming ponds as it significantly reduces the growth of algae and bacteria that may occur in extremely hot summers.
- PS: Combined with a heat pump, a solar system may even be operated as an ice rink in winter

Classic solar absorber

Meeting high demands

PREMIUM SOLAR

… the Lexan-coated absorber

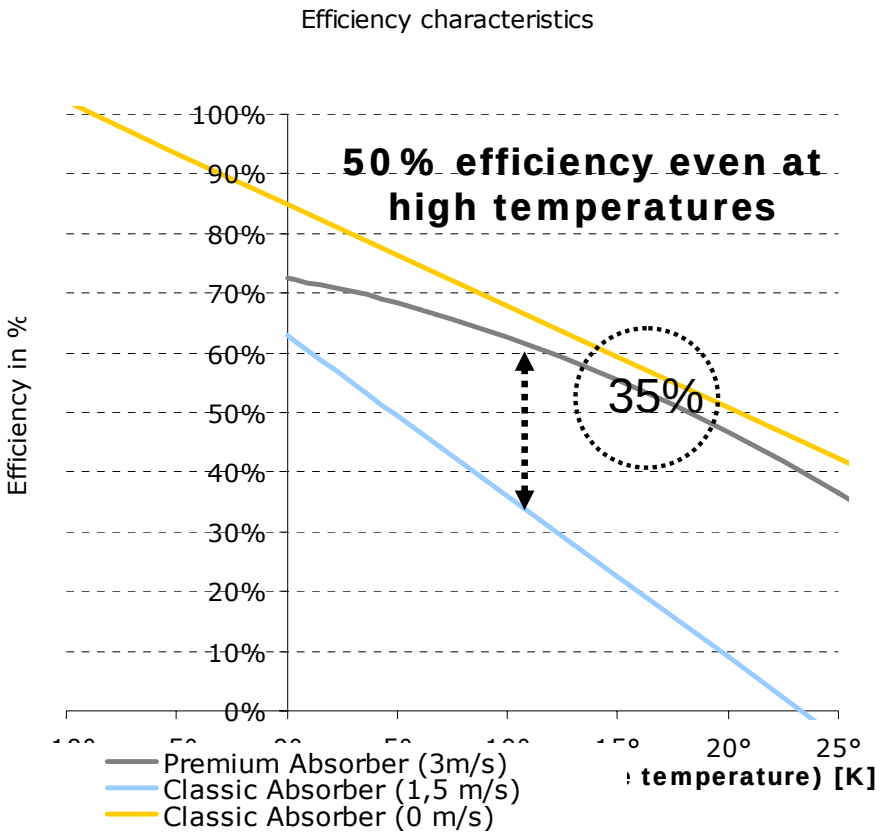
Premium Solar

whenever

- the bathing season is to be extended for as long as possible
- high marten-proofness is desired
- the roof is exposed to high winds
- an especially elegant solution is preferred
- for indoor swimming pools with high water temperatures

Premium Solarkollektor

The wind and freezing-resistant solution



… The Lexan-coated absorber

- Attains an **efficiency of about 50% +/-5%** even
  - **in high winds** (3 m/s)
  - and at a temperature delta of 15°C relative to the external temperature
- It is thus especially suitable for demanding applications such as
  - **indoor swimming pools**
  - or combined with glass domes (for a longer season)
- Filled with anti-freezing agent, it may even be operated all year round >>
  - **about 10 months of solar pool heating**

Premium solar collector

Easy to install

Can be installed on any roof

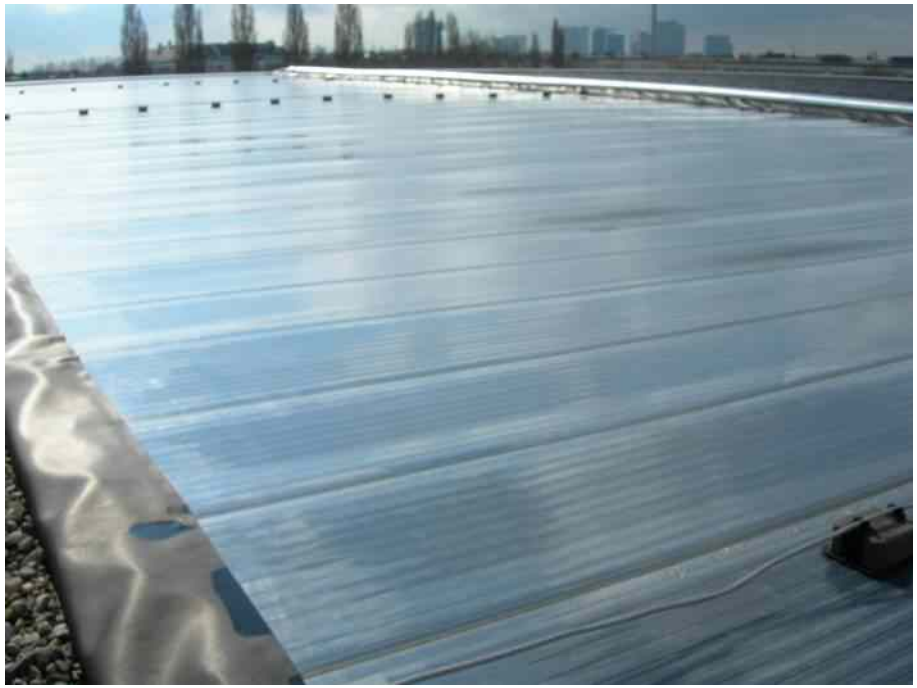
Unlike glazed collectors

- **independent of irradiation angle** as absorber-based
- Therefore **no complex roof structure** needed
- No structural problems (**total load on roof about 20 kg)**

Premium solar collector

as solar optimiser

Can be installed on any roof



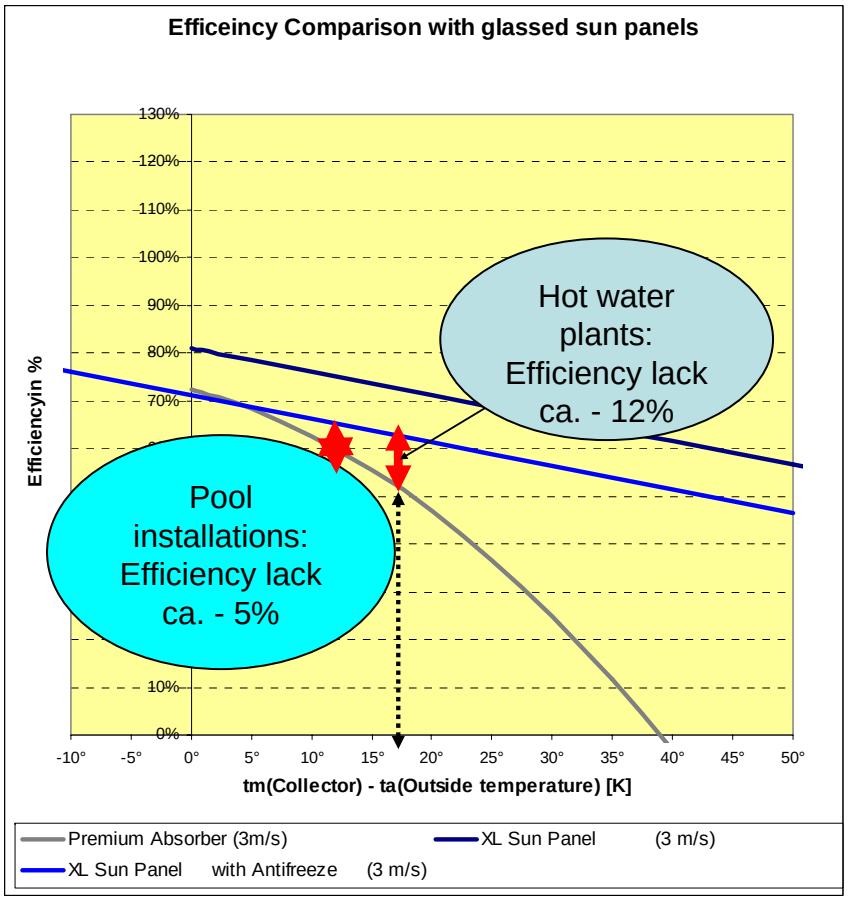
Perfect for large systems

- Compact installation possible even on large areas
- The **larger the area**, the better the premium collector can demonstrate its good cost/benefit performance
- Can also be **combined with the Classic absorber**

  This enables you to combine the advantages of ClassicSolar (using air circulation) with those of PremiumSolar (particularly good solar values)

Premium solar collector

for hot water / in combination with pool water

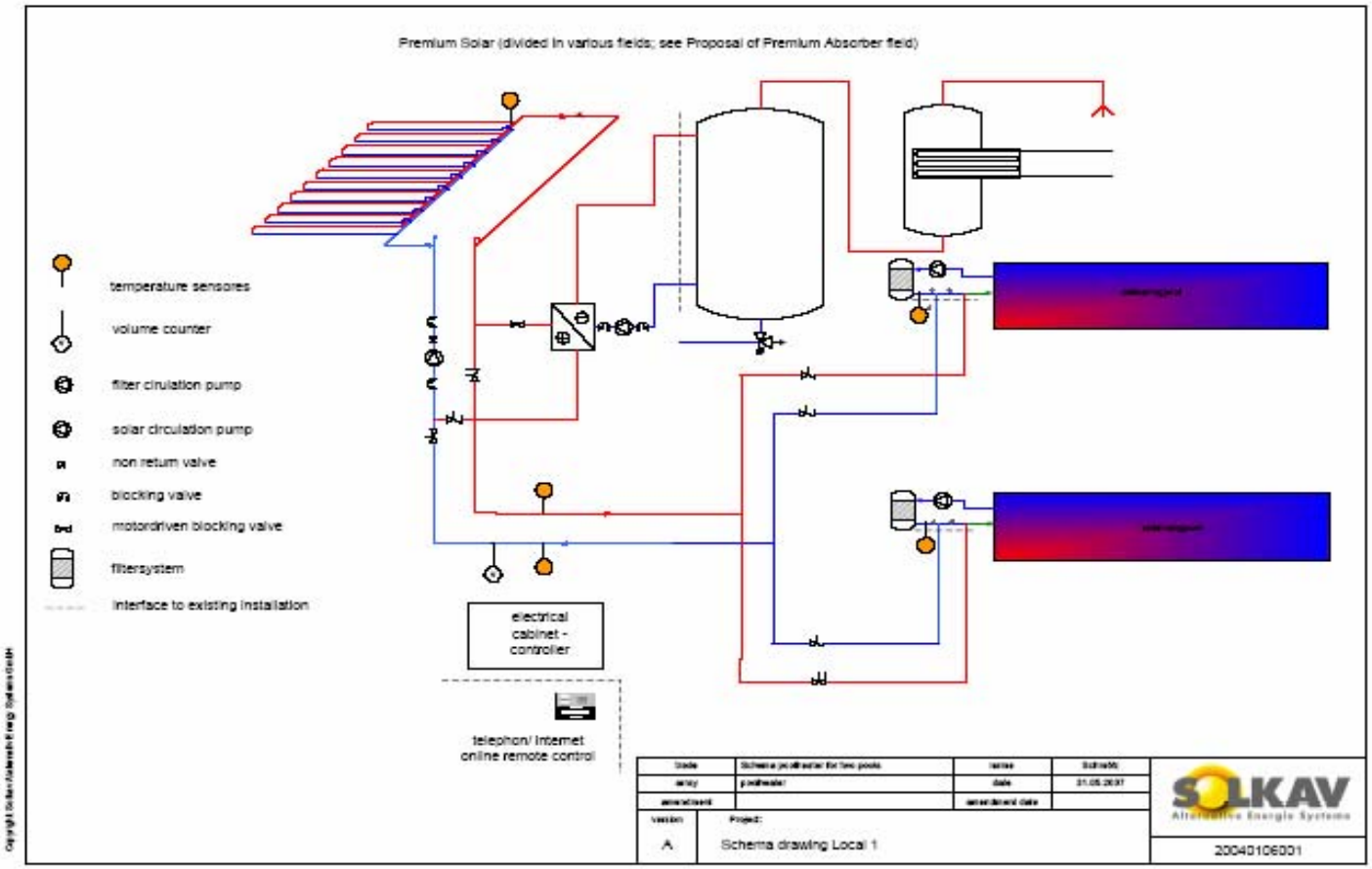


Perfectly applicable for hot water installations:

- The Premium collector
  - Needs no Antifreeze filling
  - Got run with low temperatures (40° - 50
  - Needs no or less heat changers in between
- And is therefore more or less equal in comparison to glassed sun panels.
- But with cost of: -40%

Premium solar collector

for hot water / in combination with pool water



Very Efficient

At the temperature

level up to

50° +/-5°

- Continuously operated equal in terms of kWh output in comparision to glassed sun panels

- At Cost of

  -40%

SPORT solar absorber

The space-saving alternative

SPORTSOLAR

Solar absorber can be installed as:

- a terrace
- a pool-side walkway
- or as sports flooring

It is always

- slip-proof
- and safe

European patent

All colours are possible (very light shades are not recommended, though)

SPORT solar absorber

Installation on the ground

Once the ground has been prepared, the classic **EPDM absorber mats** can be bonded to the flooring. For this job, the same bonding agent is used that is used for fixing absorber mats to the roof.

When the bonding agent has cured, the mats can be filled with EPDM pellets of the desired colour. Once this job has been completed, the coating has to rest for one day before the finish can be applied.

SportSolar systems can be made to fit any design and perform several functions (solar system, playing court, ice rink, …)

SPORT solar absorber

SportSolar designed to meet your needs

Maspalomas / Gran Canaria 2006

- The piping ducts are constructed along the edge and covered by plastic grids.
- The efficiency of flooring is similarly high as that of roof-mounted systems. The floor structure provides additional protection against the wind.
- Any number of stays can be integrated into the flooring.

Blue, blue-grey, red, red-black, anthracite, volcano rock brown – whatever you desire

SPORT solar absorber

SportSolar – maxi version

Burbach/NRW 2003

Neulengbach/Wien 2001

… so there‘s nothing to stop some fun in the pool.
SportSolar systems have anti-slip surfaces, which reduces the risk of injury. The walkway around the pool always has a comfortable temperature.

SPORT solar absorber

SportSolar as sports flooring

Also suitable for use as sports flooring

- similar to Tartan flooring
- for all ball games

  - ◇ tennis
  - ◇ basketball
  - ◇ handball
  - ◇ badminton
  - ◇ etc.

SPORT solar absorber

SportSolar with ClassicClay properties

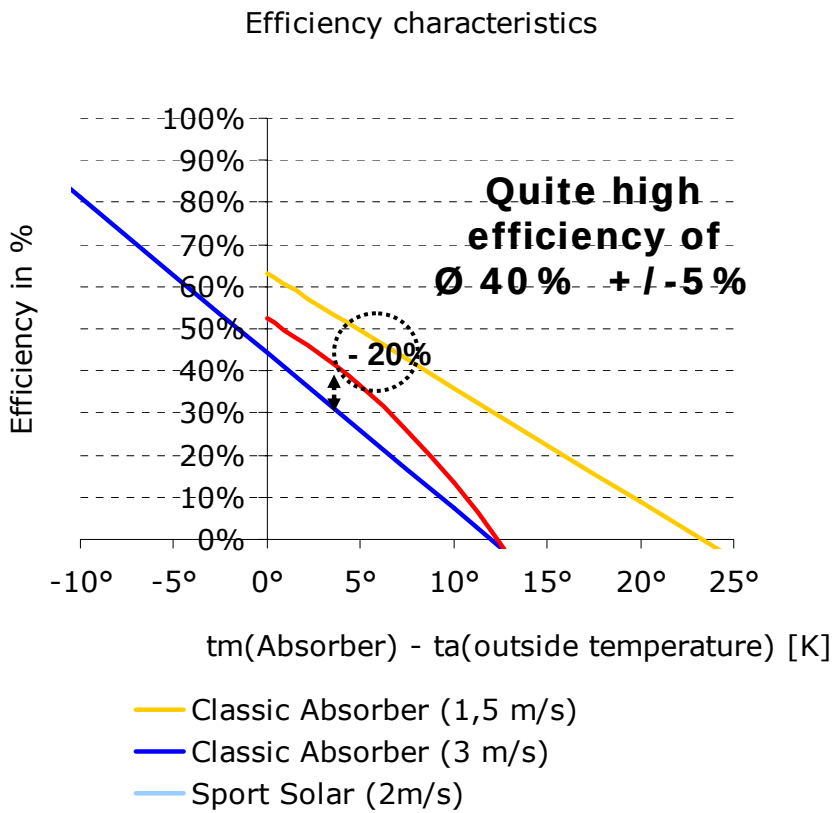
Also suitable for tennis courts

- Characteristics like a **clay court**
- **Easy on joints and muscles**
- Requires only **minimal maintenance**
- **Water permeable** and insensitive to weather conditions
- **Always the same characteristics,** regardless of the season
- **Attractive appearance (brick-red)**
- **Long service life**

… tennis of clay-court quality

SPORT solar absorber

Solar absorber without extra space needs



Quite efficient in actual operation

- Hardly inferior to standard absorber
- **About 40 % +/-5 % efficiency**
- Hardy affected by windy conditions due to in-floor installation

At wind speeds of 3m/sec or more even **superior** to roof-mounted absorbers **!**

Solar absorber + heat pump

Thermal reliability & energy conservation

SOLARBOOSTER

The Solkav SolarBooster concept: even an outdoor spa bath can be heated by a solar-assisted system

You want 100% thermal reliability while minimising your energy costs?

To achieve this, we combine the absorber system with a heat pump.

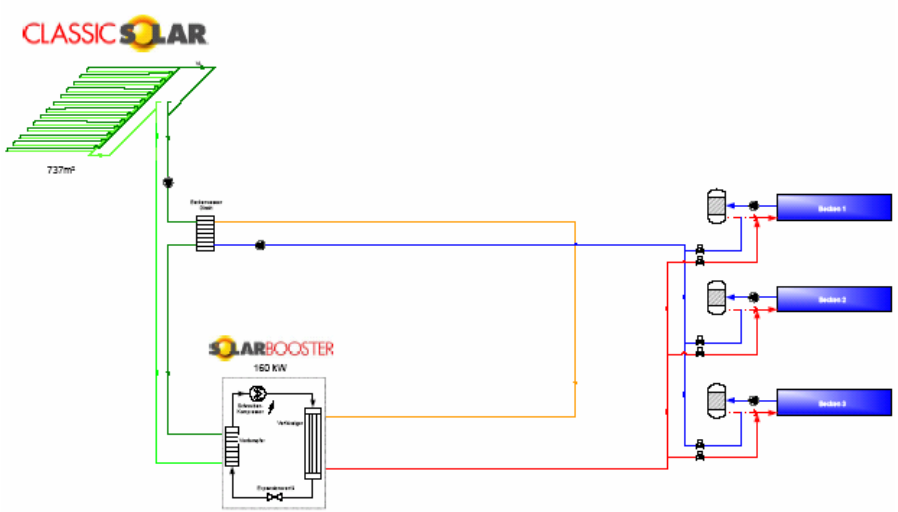
Such a system normally operates with solar energy and switches to the heat pump only in poor weather conditions.

⇨ Energy costs amount to only 15% of a standard oil/gas heating system or 50% of a standard air-source heat pump.

Solar absorber + heat pump

Thermal reliability & energy conservation

SOLARBOOSTER



The integrated solution

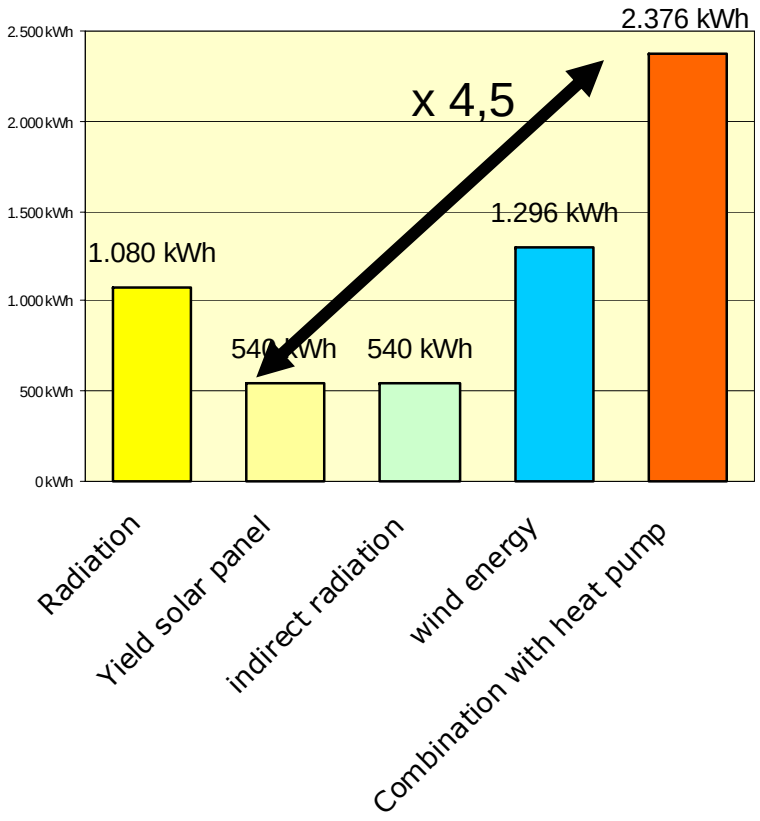
- When the sun shines, the system operates with solar energy
- When there is no sunshine or by night, the system operates
  - as heat-pump based system that
  - extracts primary energy from the air.

♥ Perfect for indoor swimming pools

Solar absorber + heat pump

Thermal reliability & energy conservation

Heat yield of a absorber in combination with heat pump



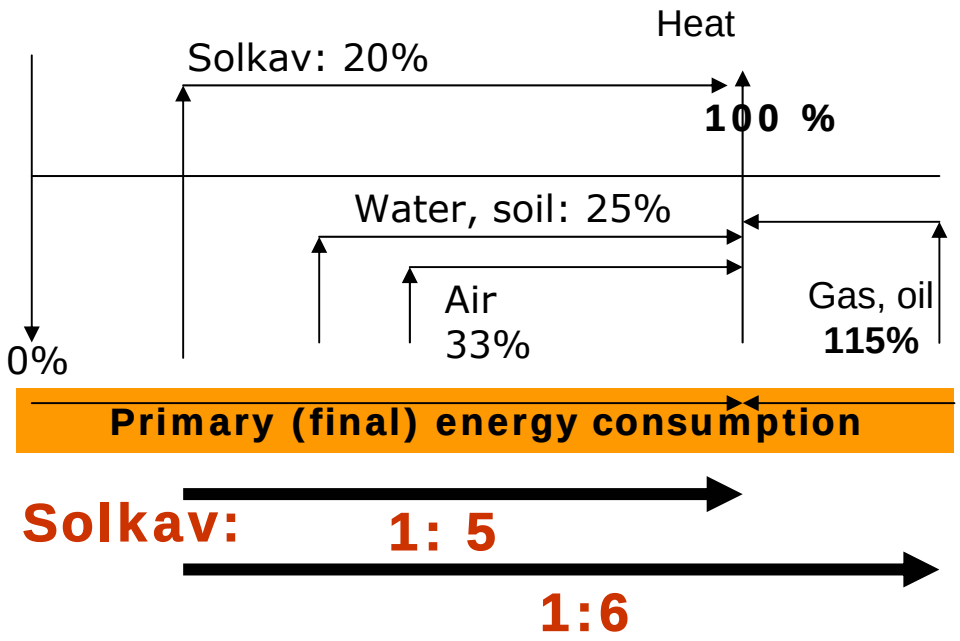
In combination with a heat pump

- Is the solar absorber at the same time a **hugh heat changer plant,**
  - which also absorbs diffuse radiation
  - And also extract heat of the air and increase the yield of the absorber in comparision to a sun panel by **4,5**
- **24 hours operation**
  - Also **without any solar radiation**
  - And during **the night**
- With **constant kWh output**,
  - Because the consumption of electrical power egalize different kWh input of the absorber.
  - As long the absorber is not covered by snow

Solar absorber + heat pump

Thermal reliability & energy conservation

SOLARBOOSTER



Location: Central Europe

Heating power superior to that of any other heat pump system as

- **solar irradiation is added** to the ambient heat (air)
- At 250 watts per m² of absorber area, the average energy yield is very high (soil: 50 – 70 watts)
- Due to the use of brine (a mix of glycol and water) as a medium
  - the power consumption for "moving the medium" is only 25% of that needed by air-source heat pumps
  - Because of the large size of the heat exchanger surface, icing occurs only at freezing temperatures. Can be operated at outside temperaturs of down to 0°C.

Solar absorber + heat pump

Thermal reliability & energy conservation

Energy conservation by public baths in Wien Donaustadt
Details from Axima Gebäudetechnik GmbH (contractor operator)

System features: **Donaustadt: 600 m² Twin Absorber**
160 KW heat pump

Invest: 175 TEURO

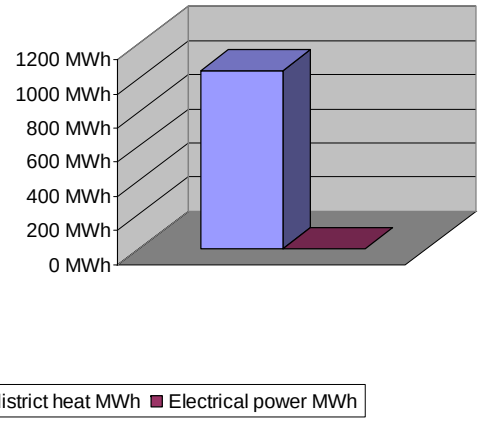
Cost MWh District heat:
46 EUR

Cost MWh electr. power:
80 EUR

Coeff. of performance: 05.Mai

DONAUSTADT 2005/06	Jun	Jul	Aug	Sep	Oct.	Nov.	Dec.	Jn	Feb	Mar	Apr	May	And.	Total
Saving on district heat MWh	182	136	107	58	- 20	37	92	85	67	115	146	157	-120	1.044
Electrical power MWh	0	0	0	0	- 0	0	0	0	0	0	0	0	- 0	0
													Saving	48 TEURO
													Amortisation period	3,6 Jahre

Savings in MWh



More than 15 systems installed and in operation

Stable results with about:

- **11 months of operation; about 5500 full load hours per KW installed**
- **Heat – electric power usage ratio of 1:5**
- **Conservation of caloric energy (depending on primary energy); about 1:6**
- Example:
  - 160 KW installed
  - Replaces 1m kWh of district heat
  - 1 : 5.5 ratio of district heat reduction to additional power consumption
  - Annual savings of EUR 33,000
  - Investment: EUR 175,000
  - Amortisation period: 5.3 years

Solar absorber + heat pump

Variation: Combination with ice rink

♥ Conserving energy and having fun

The technology installed is put to dual use

- In winter, as **ice rink** using **waste heat from the indoor swimming pool**

  >> therefore the energy for the ice rink is free

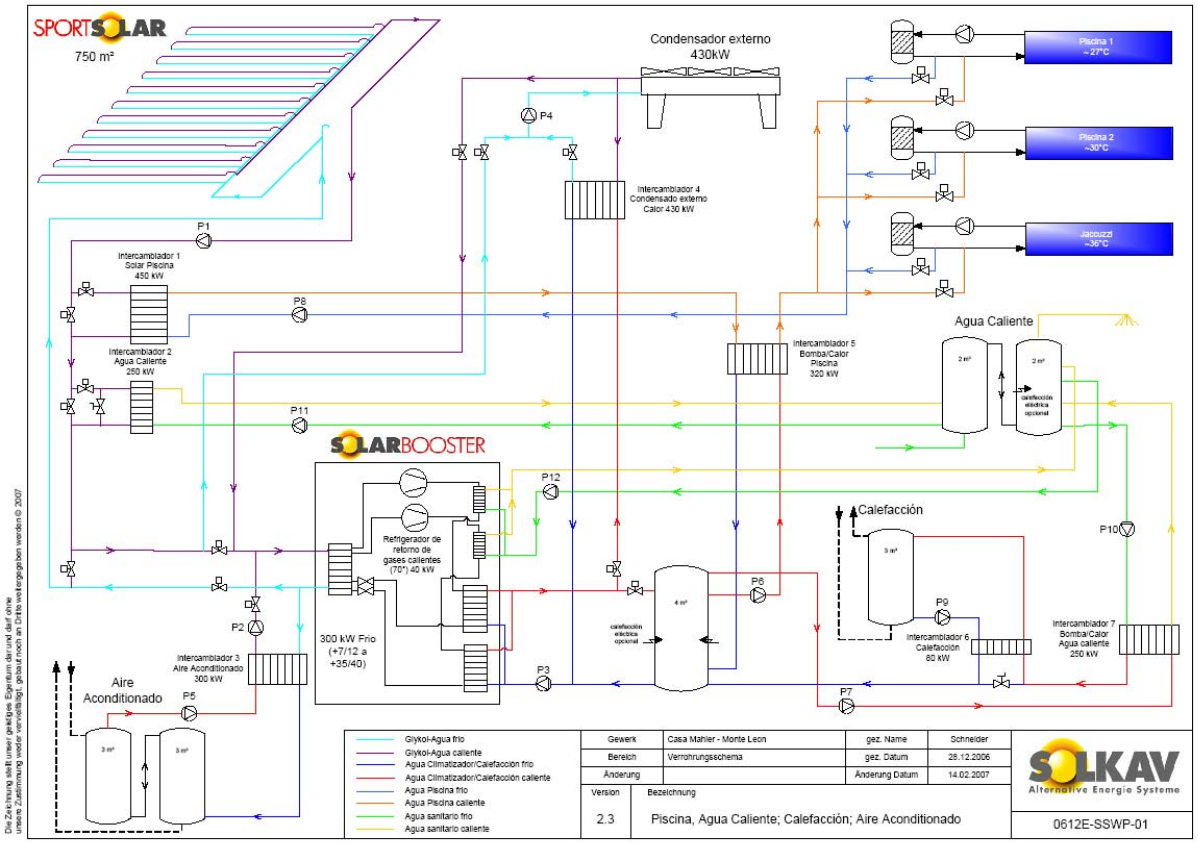
- In spring, summer and autumn as integrated **solar+heat pump system**

  >> with the "usual" savings

- Can also be configured as a **combined air conditioning system**

Solarabsorber + heat pump

Variation: Combination with climatisation



The installed plant and the consumed energy can be used twice:

- **At the same time for climatisation and for the supply of heat**
- **The waste heat of the climatisation process can be used to heat a pool or to preheat shower water**

>> in this case the cost of climatisation is for free.

- Through integration of solar absorber energy the cost of the system get to be reduced further
- Usable for big climatisation consumers like
  - Hotels;
  - shopping malls;
  - office buildings

♥ Energieeinsparung und Performance

Solar absorber + heat pump

gas-powered

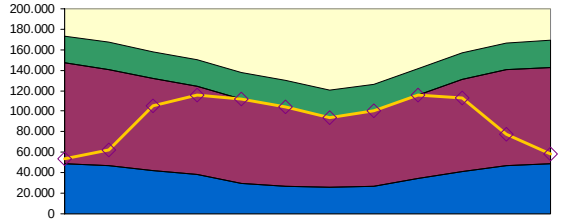
In 2007 the Bäderland Group in Hamburg put the first gas engine driven solar absorber/heat pump system into operation:

- **From 200 KW (winter) to 350 KW (summer) + 110 KW waste heat**
- **One reciprocating piston; NH^3 with TEWI value of zero**
- **Expected average COP: heat – gas coeff. of performance: 1:2.9**
- **330 operating days per year**
- **Annual energy cost savings: EUR 65,000**
  - Investment: EUR 350,000
  - Amortisation period: 5.3 years

SOLKAV scope of delivery

Feasibility study

SOLAR-ASSISTED COVERAGE of HEATING REQUIREMENTS	61,8%



Heating requirements in kWh

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
Outdoor pool	48447	46570	41765	38636	30107	27145	25488	27255	34202	40893	46464	48519	455.493
Indoor pool	98678	94388	90097	85807	81517	77226	68646	72936	81517	90097	94388	94388	1.029.685
Hot water	26063	26063	26063	26063	26063	26063	26063	26063	26063	26063	26063	26063	312.754
T/requirement	173188	167020	157926	150506	137687	130434	120196	126254	141782	157054	166915	168970	1.797.932

COVERAGE OF HEATING REQUIREMENTS by SOLKAV in kWh													
SOLKAV	53702	62265	104834	115862	111624	104371	94134	100191	115719	112971	77715	58582	1111970
in % of requ.	31%	37%	66%	77%	81%	80%	78%	79%	82%	72%	47%	35%	62%

- Analysis of ACTUAL energy consumption
  - by user groups and temperature levels
  - over the year and during the day
- Simulation of cost savings based on
  - local solar/temperature data
  - current and projected energy costs

in kWh	Heating requirement	SOLKAV	Saving
Effective energy	1.111.970	221.965	890.005
		COP:	5,0

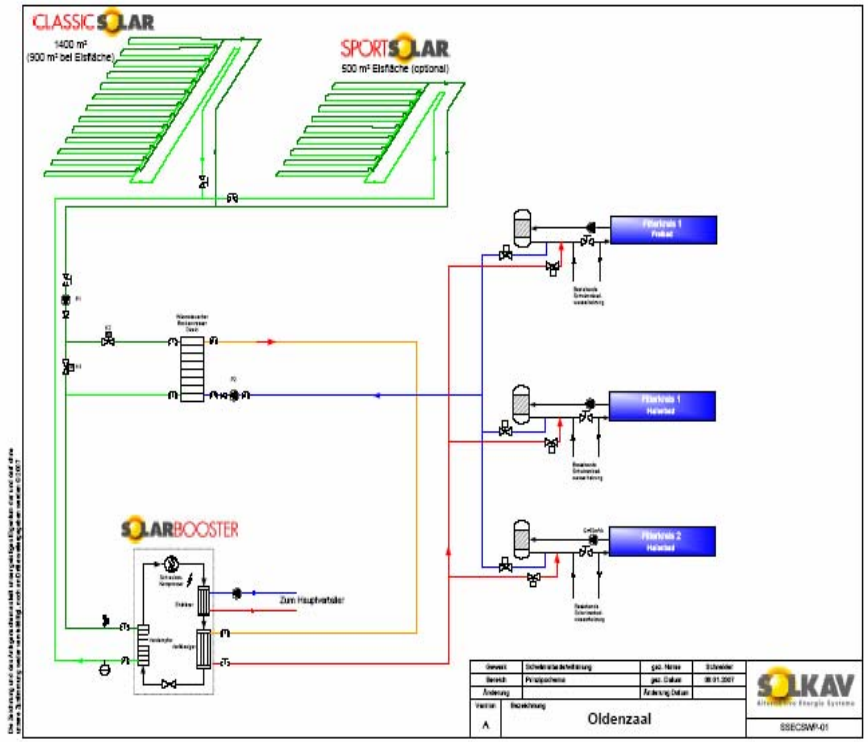
PRIMARY ENERGY BALANCE FOR TOTAL SYSTEM			
in kWh	Convent. System	SOLKAV	Saving
Energy consumption	1.235.522	221.965	1.013.557
residual conv. portion	762.180	762.180	0
TOTAL	1.997.702	984.145	1.013.557
		Saving	51%

in EUR

- Proposed optimised solar/heat pump combination
  - Pure solar system?
  - Combination with heat pump?
  - Special solutions such as ICE or gas-powered

SOLKAV scope of delivery

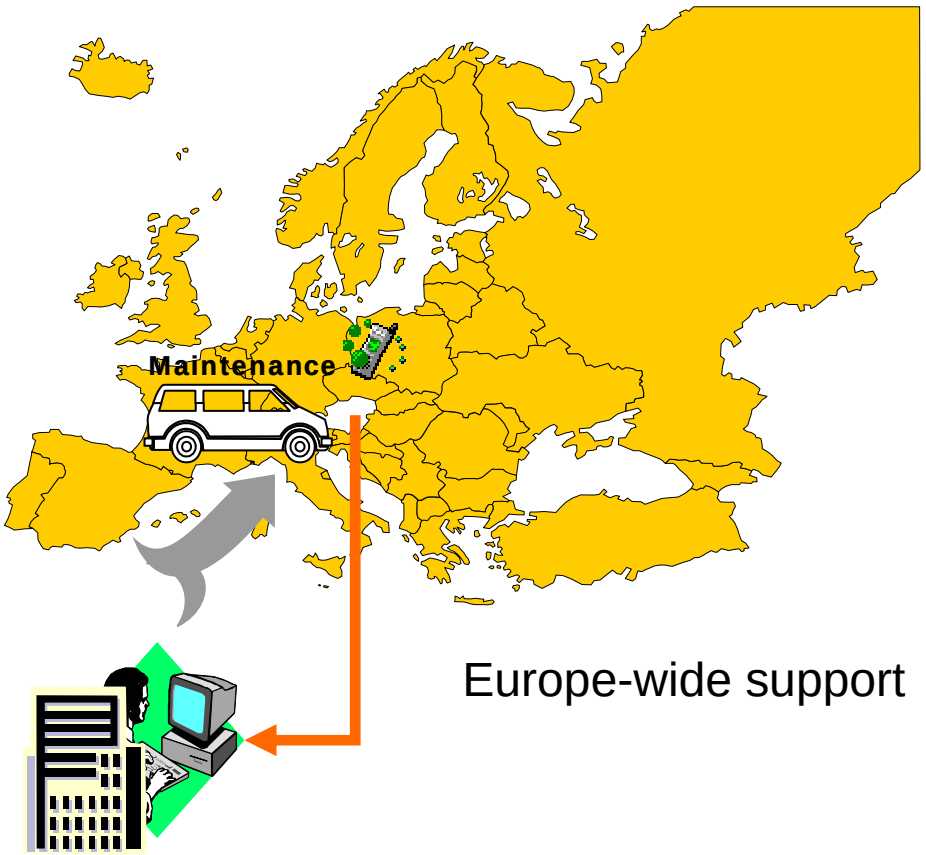
Ready to use: from plan to completion



- Solkav provides the engineering design
  - as general contractor
  - or in co-operation with your engineering consultant
- Solkav assembles the entire system
  - the absorber system
  - the hydraulic system
  - the electrical and control systems
- delivers and fine-tunes you system

SOLKAV scope of delivery

After-sales service



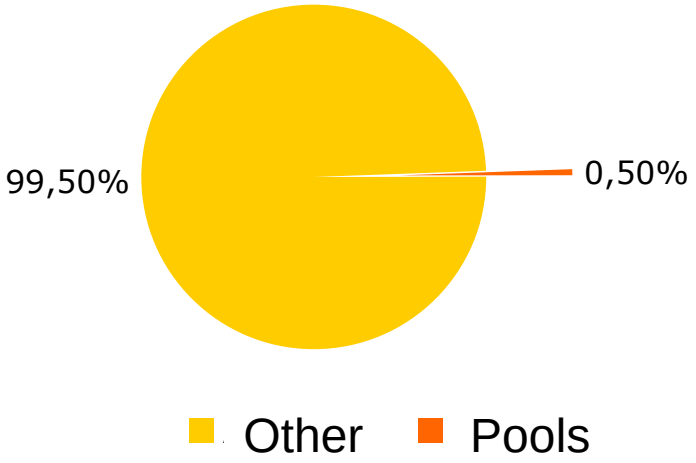
Europe-wide support

- SOLKAV provides on-site training to your team, enabling them
  - to operate the system independently and in the most efficient manner
- SOLKAV
  - offers remote maintenance on-line at any time
  - provides on-site fault-clearing services and/or instructs its local contractors
- SOLKAV will be pleased to provide
  - spring and autumn maintenance
  - full-scale maintenance including any repair work desired

SOLKAV references

Reduction of CO_2 emissions

CO_2 share of total Co_2 emissions



Existing swimming pools:

- Outdoor and indoor pools:
  Austria: 1,500
  Germany: 8,500
- Private pools and hotel indoor pools:
  Austria: 60,000
  Germany: 500,000

To heat these pools; and the infrastructure such as hot water and space heating one requires (approximately):

Heat:

- 1.5m MWh (Austria),
  22.0m MWh (Germany)

$C0_2$:

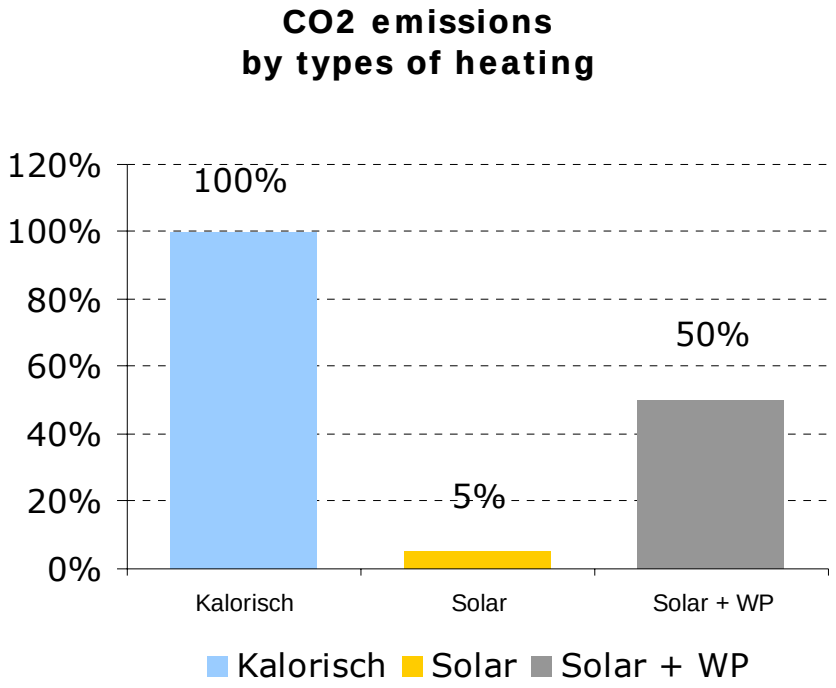
- 300,000 tons (Austria)
- 1,500,000 tons (Germany)

Or caloric power stations of 500 MW each:

- 1 power station (Austria)
- 12 power stations (Germany)

SOLKAV references

Reduction of CO_2 emissions



The use of

solar heating (outdoor pools) and solar+heat pump heating (indoor pools) results in

- **95% less CO2 with solar heating**
- **50% less CO2 with solar + heat pump heating**

Universal use of the technology (and reduction of the fossil portion to only supplementary heating) will reduce CO_2 emissions as follows:

- **75% -80% of CO2 emissions** related to swimming pools

  That is:
- **240,000 tons (Austria)**
- **1,200,000 tons (Germany)**

Or in caloric power stations of 500 MW each:

- 1 power station (Austria)
- 8 power stations (Germany)

SOLKAV Anything else?

Ice Rinks for Rent

Säntispark – St. Gallen 2004

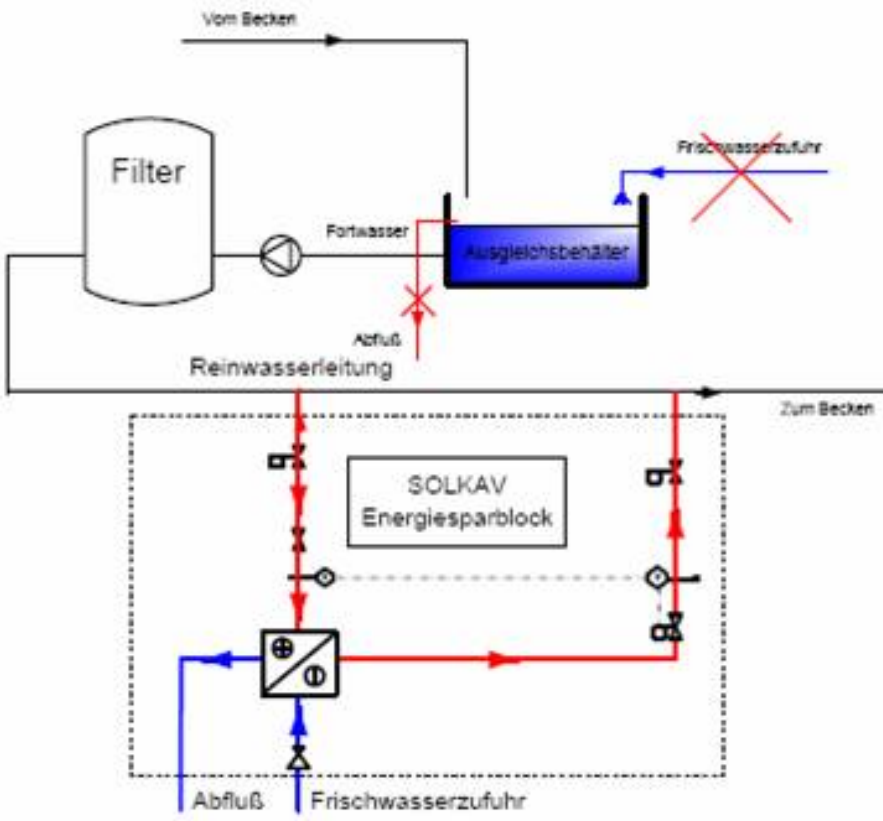
We rent mobil Ice rinks

- For each individual lay out
- Turn key incl. all Acessoirs (chiller technology; barriers; skating equipement; Ice resurfacing tools; etc.)
- Fast to built and to extract
- In combined projects with heat pump use; just as a winter additional

* Being a manufacturer you will find a lot more of our equipment installed as we rent on our own-

SOLKAV Anything else?

Fresh water package



An average indoor pool area needs

- 20 m³ fresh water a day
- Need therefore 18° x 1,163 x 0,05 EUR/cost per kWh heat x 7.200 m³

  = **ca. EUR 7.500 HEAT**
- 7.200 m³ x 4 EUR per m³ (Fresh water + sewage fees)

  = **~~ca.~~ EUR 28.800 cost of fresh water**

With the **Solkav Fresh water package**

- You pick up the heat of the sewage water and give it the fresh water: - **95% savings of heat**
- Rreduce the consumption of fresh water **30% – 50%**

The relatively small investment pay back in approx. 3 years.

Solar absorber + heat pump

Estimated Cost and savings

Estimated cost for outdoor pools, installed; in EUR excl. VAT

Pool size	Energy need	Classic Solar		PremiumSolar		Sportsolar		Combined absorber/heat pump	
150 m²	120.000 kWh	120 m²	€ 18.000	113 m²	€ 39.375	150 m²	€ 45.000	150 m² / 50 KW	€ 70.000
312 m²	249.600 kWh	150 m²	€ 22.500	150 m²	€ 48.000	312 m²	€ 84.240	250 m²/ 80 KW	€ 100.000
450 m²	360.000 kWh	312 m²	€ 37.440	234 m²	€ 70.200	450 m²	€ 112.500	400 m² / 120 KW	€ 120.000
600 m²	480.000 kWh	450 m²	€ 49.500	338 m²	€ 97.875	600 m²	€ 138.000	450 m² / 150 KW	€ 140.000
850 m²	680.000 kWh	600 m²	€ 63.000	450 m²	€ 126.000	850 m²	€ 178.500	600 m² / 200 KW	€ 170.000
1.000 m²	800.000 kWh	850 m²	€ 85.000	638 m²	€ 172.125	1.000 m²	€ 200.000	800 m² / 250 KW	€ 200.000
1.250 m²	1.000.000 kWh	1.000 m²	€ 100.000	750 m²	€ 195.000	1.250 m²	€ 250.000	900 m² / 300 KW	€ 225.000
		1.250 m²	€ 125.000	938 m²	€ 234.375				

* In the case of biologic swimming pools just the pool area has to be counted

Savings for indoor pools: in EUR; excl. VAT

	Assumption: EUR 0,065 per kWh Oil/Gas with 85% efficiency				Assumption: EUR 0,100		Pool. Hot Water per kWh elektrical power	
Region Northern Europe: (Netherlands; Germany; Baltic see)	250 kWh	€ 16	300 kWh	€ 20	220 kWh	€ 14	583 kWh	€ 30
Region Middle Europe: Mitteleuropa; Belgien; Nordfrankeich	280 kWh	€ 18	350 kWh	€ 23	250 kWh	€ 16	667 kWh	€ 34
Region north. South Europe: (France: Italy: North and Mid; northern Spain und Portugal; Balcan Area)	350 kWh	€ 23	400 kWh	€ 26	320 kWh	€ 21	1.333 kWh	€ 68
Region South: Spain and Portugal: south and Mid; Baleares; Greece	450 kWh	€ 29	550 kWh	€ 36	400 kWh	€ 26	1.667 kWh	€ 85
Region southern South: Canary Islands - Winter bathing areas	600 kWh	€ 39	800 kWh	€ 52	550 kWh	€ 36	2.125 kWh	€ 108

♥ We will be pleased to design the optimum system layout for you without engagement

Solar absorber + heat pump

Estimated Cost and savings

Estimated cost for indoor pools; installed; in EUR excl. VAT

Pool size	Energy need	Classic Solar		PremiumSolar		Sportsolar + heat pump		Combined absorber/heat pump	
150 m²	**225.000 kWh**	180 m²	**€ 27.000**	150 m²	**€ 57.000**	50 KW / 220 m²	**€ 113.000**	50 KW / 220 m²	**€ 80.000**
312 m²	**468.000 kWh**	374 m²	**€ 44.928**	312 m²	**€ 106.080**	100 KW / 350 m²	**€ 177.500**	100 KW / 350 m²	**€ 125.000**
450 m²	**675.000 kWh**	540 m²	**€ 59.400**	450 m²	**€ 144.000**	150 KW / 500 m²	**€ 255.000**	150 KW / 500 m²	**€ 180.000**
600 m²	**900.000 kWh**	720 m²	**€ 75.600**	600 m²	**€ 180.000**	180 KW / 650 m²	**€ 307.500**	180 KW / 650 m²	**€ 210.000**
850 m²	**1.275.000 kWh**	1.020 m²	**€ 102.000**	850 m²	**€ 238.000**	260 KW / 1000 m²	**€ 450.000**	260 KW / 1000 m²	**€ 300.000**
1.000 m²	**1.500.000 kWh**	1.200 m²	**€ 120.000**	1.000 m²	**€ 260.000**	320 KW / 1200 m²	**€ 555.000**	320 KW / 1200 m²	**€ 375.000**
1.250 m²	**1.875.000 kWh**	1.500 m²	**€ 150.000**	1.250 m²	**€ 312.500**	400 KW / 1500 m²	**€ 675.000**	400 KW / 1500 m²	**€ 450.000**

* In the case of swimming ponds; calculations are based only on the swimming ares x 3

* outdoor pool for full-year oparation; area x 3

Surcharge for gas engine: **40%**

Savings for indoor pools: in EUR; excl. VAT

Pool. Hot Water

	Assumption:	0,065 EUR per kWh Oil/Gas with 85% efficiency				Assumption:	0,100 EUR	per kWh elektrical power	
Region Northern Europe: (Netherlands; Germany; Baltic see)	320 kWh	**€ 21**	400 kWh	**€ 26**	1.120 kWh	**€ 50**	1.400 kWh	**€ 63**
Region Middle Europe: Mitteleuropa; Belgien; Nordfrankeich	380 kWh	**€ 25**	480 kWh	**€ 31**	1.280 kWh	**€ 58**	1.600 kWh	**€ 72**
Region north. South Europe: (France: Italy: North and Mid; northern Spain und Portugal; Balcan Area)	450 kWh	**€ 29**	600 kWh	**€ 39**	1.440 kWh	**€ 65**	1.800 kWh	**€ 81**
Region South: Spain and Portugal: south and Mid; Baleares; Greece	550 kWh	**€ 36**	750 kWh	**€ 49**	1.600 kWh	**€ 77**	2.000 kWh	**€ 97**
Region southern South: Canary Islands - Winter bathing areas	650 kWh	**€ 42**	900 kWh	**€ 59**	1.760 kWh	**€ 85**	2.200 kWh	**€ 106**

♥ We will be pleased to design the optimum system layout for you without engagement

SOLKAV

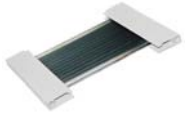
Solar absorber & heat pump technology

Which solar type are you?

Always true:

With a SOLKAV solar/heat pump system you can cut your energy costs substantially and your investment will pay for itself in just a few years.

ClassicSolar: the easy-to-install standard system



PremiumSolar: for very windy conditions and indoor pools

SportSolar: for in-floor installation

Combined with heat pump: for full-year and round-the-clock operation

&

Ice and gas-powered systems as special options

SOLKAV references
of the past 5 years

- **Solar absorber and heat pump systems:**
  - 6 indoor swimming pools in Vienna: Donaustadt 2003; Grossfeldsiedlung 2003, Hietzing 2003, Floridsdorf 2005, Jörgerbad 2006, Favoriten 2005
  - 3 in Germany: Brüggen 2003, Gelnhausen 2004; Birkerteich 2005
  - 2 in Benelux: DeBilt (2007); Izegem (2006)

- **Systems combined with ice rinks:**
  - NL - Haarlem (2005)
  - Polen – Kolobrzeg (2006)

- **Systems combined with air-conditioning:**
  - Sofia (2004)
  - Maspalomas / Gran Canaria (2007)

- **Large absorber systems:**
  - SportSolar: A – Neulengbach (2001); D– Hänigsen (2004); Burbach (2003); Gran Canaria – SunClub 82006);
  - PremiumSolar: A – Wien-Floridsdorf (2005); D – Rossdorf (2003)

- **Energy contractors,**
  - such as AXIMA
  - and Siemens Gebäudetechnik;

  operating Solkav systems as contractors

- **Large municipalities**
  - such as the city of Vienna (a client for 20 years) and about 25 systems in the grid
  - Bäderland Hamburg with the first gas-powered heat pump

- **Energy utilities,**
  - such as AVACON (Lower Saxony) who recommend the Solkav concept to their energy customers

- **Engineering consultants**
  - who are familiar with Solkav products

- **Partners in industry**
  - Water treatment firms such as BSA
  - Makers of stainless steel pools like Berndorf

SOLKAV

Solar absorber & heat pump technology

A good feeling

- Environmentally friendly
  - Apart from the sun, solar absorbers do not need any extra energy input
  - Heat pump technology minimises energy consumption

- Operation of the system is easy on your pocket

♥ Enjoy fun, sports and well-being with a clean conscience

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