SOLAIR

Increasing the Market Implementation of Solar Air-Conditioning Systems for Small and Medium Applications in Residential and Commercial Buildings

Intelligent Energy Europe

SOLAR THERMAL SYSTEMS in EU and Greece

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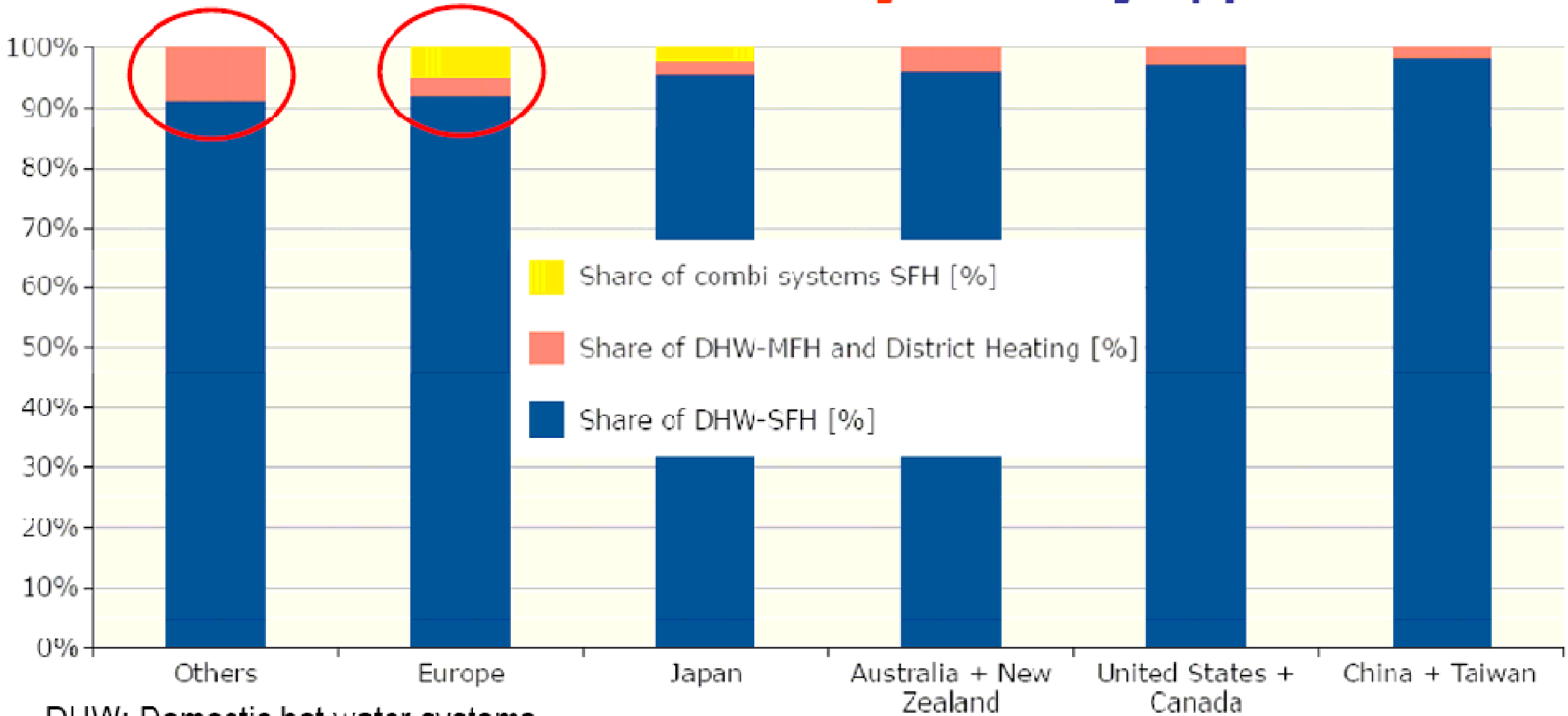
Distribution of solar thermal systems by application



DHW: Domestic hot water systems
SFH: Single family houses
MFH Multi-family houses
Combisystems: Systems for DHW and space heating

Source: IEA-SHC, Solar Heat Worldwide Edition 2008, www.iea shc.org

Others: Barbados, Brazil, India, Israel, Jordan, Mexico, Namibia, South Africa, Tunisia and Turkey

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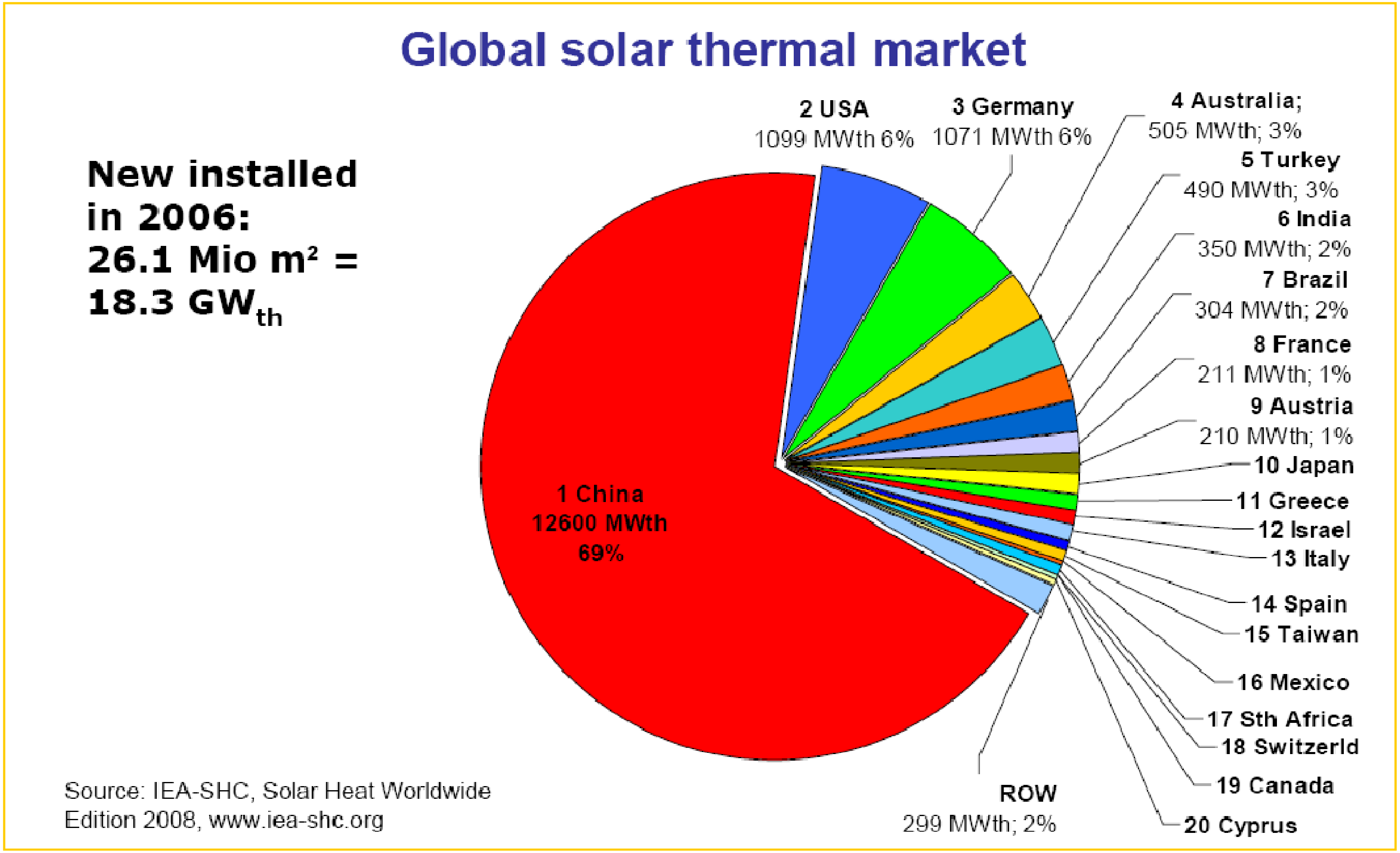

Conversion factor: 1 m^2 collector = 0,7 kW_{th} installed capacity

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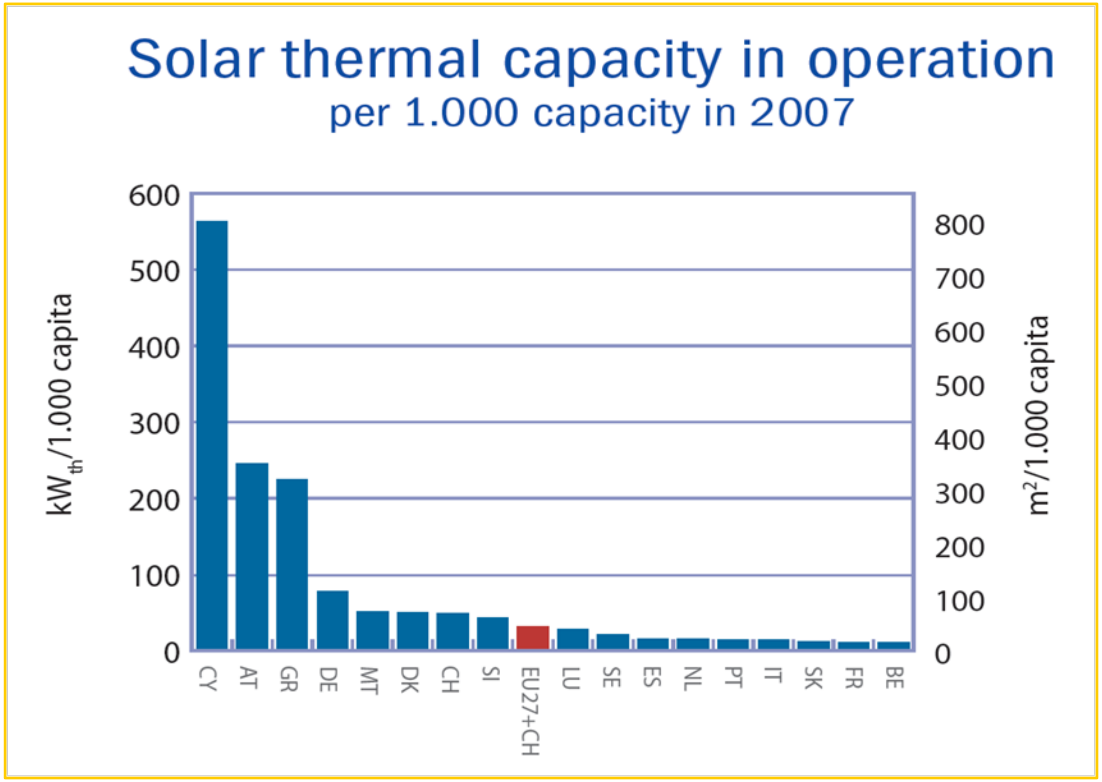

- **Cyprus is 1st: 562 kWth** in operation per 1.000 capita
- **Greece is 3rd**
- **EU average: 30,7 kWth** /1.000 capita.
- Austria shows the rest what is possible: 244 kWth/1.000 capita, 8 times the EU average.

The figures relate to all installations built in the past and deemed to be still in operation (ESTIF assumes a life-time of 20 year for systems installed after 1989) and to today's size of the population.

3.2 Greek market share

	In Operation[2]	Market (=Newly Installed)					Market Growth
	2007	2005	2006	2007			2007/2006
	Total Glazed m^2	Total Glazed m^2	Total Glazed m^2	Total Glazed m^2	*Flat Plate m^2*	*Vacuum Collectors m^2*	Total Glazed %
AT (Austria)	2 892 627	233 470	292 669	281 000	*277 600*	*3 400*	-4%
BE (Belgium)	146 118	20 234	35 636	42 000	*37 000*	*5 000*	18%
BG (Bulgaria)	25 100	2 000	2 200	2 500	-	-	14%
CH (Switzerland)	508 980	39 132	51 863	65 432	*62 878*	*2 554*	26%
CY (Cyprus)	625 200	50 000	60 000	65 000	-	-	8%
CZ (Czech Republic)	131 730	15 550	22 030	25 000	*18 900*	*6 100*	13%
DE (Germany)	8 994 000	950 000	1 500 000	940 000	*840 000*	*100 000*	-37%
DK (Denmark)	385 280	21 250	25 300	23 000	*22 000*	*1 000*	-9%
EE (Estonia)	1 470	250	300	350	-	-	17%
ES (Spain)	964 166	106 800	175 000	262 000	*251 000*	*11 000*	50%
FI (Finland)	20 493	2 383	3 200	4 000	*3 000*	*1 000*	25%
FR (France)	870 600	121 500	220 000	255 000	*243 000*	*12 000*	16%
GR (Greece)	3 570 200	220 500	240 000	283 000	*279 000*	*4 000*	18%
HU (Hungary)	14 250	1 000	1 000	8 000	*6 000*	*2 000*	700%
IE (Ireland)	30 790	3 500	5 000	15 000	*10 000*	*5 000*	200%
IT (Italy)	1 100 230	127 059	186 000	245 000	*210 000*	*35 000*	32%
LT (Lithuania)	3 450	500	600	700	-	-	17%
LU (Luxemburg)	18 900	1 900	2 500	3 000	-	-	20%
LV (Latvia)	5 350	1 000	1 200	1 500	-	-	25%
MT (Malta)	29 360	4 000	4 500	5 500	-	-	22%
NL (Netherlands)	338 341	20 248	14 685	19 900	*17 900*	*2 000*	36%
PL (Poland)	234 897	27 700	41 400	67 000	*44 000*	*23 000*	62%
PT (Portugal)	205 950	16 000	20 000	25 000	*22 000*	*3 000*	25%
RO (Romania)	69 600	400	400	500	-	-	25%
SE (Sweden)	262 394	22 621	28 539	25 465	*15 554*	*9 911*	-11%
SI (Slovenia)	121 300	4 800	6 900	12 000	*10 300*	*1 700*	74%
SK (Slovakia)	81 750	7 500	8 500	9 000	*7 740*	*1 260*	6%
UK (United Kingdom)	304 920	28 000	54 000	54 000	*27 000*	*27 000*	0%
EU27 + CH	21 957 446	2 049 297	3 003 422	2 739 847	-	-	-9%

Greece

- **9-10 % of European sales**
- **3,570,200 m^2 in operation**
- **283,000 m^2 newly installed glazed**
  - 279,000 m^2 flat plates
  - 4,000 m^2 vacuum

4. Greek Market

4.1 Product types and solar thermal applications

Product types

- 99% of the installed collector area is for **thermosiphonic water heaters**:
  - In studios, apartments and small pensions
  - Antifreeze liquid
  - The storage tank is mounted higher than the collectors.
  - Size range: 1.8-4 m^2 collector area, 120-220 lt storage tank.
  - Average size: 2.4m^2 collectors, 150 lt storage tank.
  - All systems have electric back-up heaters. 30% of them have an additional heat exchanger connected with the fuel or gas heating system.
  - Solar fraction >75%.
- Evacuated tube collectors: insignificant market share

Applications

- ~99% of installed collector area: Hot water in residences
- ~1% of installed collector area: Hot water in hotels.
- <1% of the installed collector area: Space heating, district heating, air conditioning and industrial process heating.

4.2 Distribution and marketing methods

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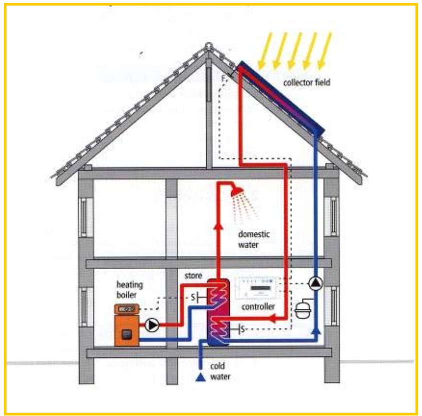
- The **maturity of the market** plays a key role. In Greece, it is considered as a **normal product**
  - offered by most heating installers, heating wholesalers
  - Specialised solar shops
- **Typical consumer motivation** to buy a solar system:
  - Savings (payback period 4–6 years)
  - Better comfort (no waiting time for the water to be heated up)
  - Availability, maintenance services, easy installation in Greek flat roofs
- **Selling of solar systems in exhibitions**: common practice
  - more than 10 building exhibitions each year.
- **Promotion methods**: Fairs, advertising in journals/radio/yellow pages, salesmen
  - 1984, 1986: large TV campaign by EBHE
  - 1994: TV campaigns by EU, EBHE and Public power corporation
  - The best promotion comes from satisfied customers.
- **Warranty 5 years or longer** (10–30 years)
- **EBHE: workshops and contacts** with professional associations (Hotels, Dairy/Wine industry)

4.3 Employment

- **3,000 people**: Total number of people employed in the solar branch.
- **1,200 people**: Manufacturing sector (production, sales and marketing, development, financial services, etc).
- **200 full time jobs:** Supply of material and services to the manufacturers.
- **1500 full time jobs:** Retail sales, planning, installation and maintenance.
- **100 full time jobs:** Research, testing and consulting.

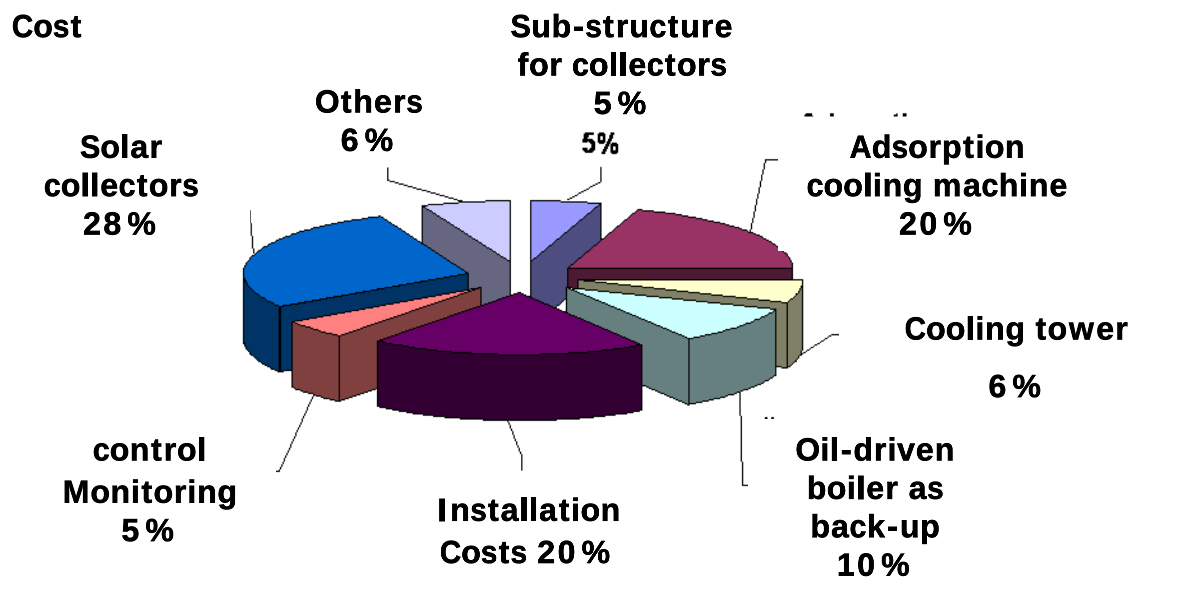


SARANTIS, Inofita Viotias

In operation since 1999

Solar cooling of a production site for cosmetics

- One of the largest installations in the world
- **2,700 m² flat plate collectors (SOLE)**
- 2 adsorption cooling machines, with 350 kW cooling power each
- 3 compression cooling machines with 350 kW air cooling and fan-coils
- Concept: economisation of electricity (Power and Work)



4.8 Manufacturers and distributors of solar thermal equipment

ALPHA THERM, Thessalonica, www.alphatherm.gr
BAYER Hellas, Athens, Theodora.Baxevani@baysystems.gr
VIOPOL Polyurethane Construction info@viopol.gr
GIALIDAKIS- HOWAT, Athens, www.howat.gr
DIMAS SOLAR, Argos, www.dimas-solar.gr
DIANA, Chalkida, dianafh@otenet.gr
EBEM- RAKOR Heating equipment, Athens, info@evem.gr
EBYK Peutitselis, Thessalonica, ebyk@ebyk.gr
EBHL, Thessalonica, www.ebil.gr
Greek Institute of Copper Development, Athens, nbergop@eiax.vionet.gr
ECONOMY NOX, Athens, www.economy-inoxsolars.gr
HELIOAKMI, Athens, www.helioakmi.com
HELIONAL, Thessalonica, www.helional.com
THERMOHELLAS, Athens, www.thermantiki.gr
THERMOILEKTRIKI, Piraeus, evlazos@otenet.gr
INTERSOLAR, Athens, www.intersolar.gr
ISOREN Insulation materials, info@isoren.gr
CALPAK-KIKERON HELLAS, Athens, www.calpak.gr
CLAPAKIS MICHAEL, Electrical Resistances, Athens, tel: 210 2475127
LASKARIS Athens, lask@otenet.gr
MATHIOUDAKI, Athens, mathiou@otenet.gr
MALTEZOS, www.maltezos.gr
MELPO, info@melpo.gr
MEVACO Mettalourgy, Kilkis, info@mevaconh.gr
BARDAKIS, Electrical Resistances, Patra, info@pyraelectric.gr
KSULINAKIS-NOBEL, Athens, www.nobel.gr
PAPAEMANUIL, Athens, www.papaemmanouel.gr
POLYFORMA, Polysterene, polyforma@otenet.gr
PRIME LASER TECHNOLOGY, Athens, www.primelasertech.gr
ROMINA, Athens, mmavra@tee.gr
SAMMLER, Athens, www.sammler.gr
SHE, www.she.com.gr
SIELINE, Athens, www.sieline.gr
SOL, Athens, www.sonne.gr
SOLE, Athens, www.sole.gr, www.eurostar-solar.com
STIEBETHERM, Athens, www.elitherm.gr
CHRISTIDIS, Metallurgy, Athens, christsa@otenet.gr

4.9 Solar thermal projects – Intelligent & FP6

- **SOLAIR**
  http://www.solair-project.eu/
- **HIGH-COMBI**
  http://www.highcombi.eu/
- **SAHC**
  http://www.sahc.eu/
- **SOLAR COMBI+**
  http://www.solarcombiplus.eu/Project/index_gr.htm
- **SOLPOOL**
  http://www.solpool.info/
- **TRANSOLAR**
- **ST-ESCOS**
  http://www.stescos.org/

5. Conclusions – The future of Solar Thermal Systems in Greece

- DHWS systems in small residential units are quite widespread

  - 80% of solar thermal market
- However, there is **large growth potential**, because
  - only 25% of the buildings are equipped with such a system
  - >90% of the owners are satisfied
- Instead of showing saturation, these developed market segments show **high level of new installations** per inhabitant, even in unfavourable times
- **Solar space heating is not widespread**
  - 8% of the solar thermal market.
  - The energy consumption for space heating does not justify this investment.
- **Lack of real incentives**

Law modernization!

Solar thermal systems project study compulsory for every new and existing building

Public financial incentives!

In investment & construction cost

Thank you for your attention!

www.bonair.gr

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