SOLAR THERMAL SYSTEMS in EU and Greece

Michaelis KARAGIORGAS
BONAI R Ltd

PhD Energy Engineer UNIVERSITE PARIS VII
Distribution of solar thermal systems by application

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

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

New installed in 2006:
26.1 Mio m² = 18.3 GWth

3.5 Solar Thermal Capacity in Operation, 2007

- **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

<table>
<thead>
<tr>
<th>Country</th>
<th>In Operation (^2)</th>
<th>Market (=Newly Installed)</th>
<th>Market Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2007</td>
<td>2005</td>
<td>2006</td>
</tr>
<tr>
<td><strong>Total Glazed m(^2)</strong></td>
<td>3,570,200</td>
<td>2,208,000</td>
<td>2,480,000</td>
</tr>
<tr>
<td>AT (Austria)</td>
<td>2,802,627</td>
<td>231,470</td>
<td>292,669</td>
</tr>
<tr>
<td>BE (Belgium)</td>
<td>146,118</td>
<td>20,234</td>
<td>35,636</td>
</tr>
<tr>
<td>BG (Bulgaria)</td>
<td>25,100</td>
<td>2,000</td>
<td>2,200</td>
</tr>
<tr>
<td>CH (Switzerland)</td>
<td>508,900</td>
<td>39,132</td>
<td>51,063</td>
</tr>
<tr>
<td>CY (Cyprus)</td>
<td>625,200</td>
<td>50,000</td>
<td>60,000</td>
</tr>
<tr>
<td>CZ (Czech Republic)</td>
<td>131,710</td>
<td>15,550</td>
<td>22,050</td>
</tr>
<tr>
<td>DE (Germany)</td>
<td>8,994,000</td>
<td>950,000</td>
<td>1,500,000</td>
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<tr>
<td>DK (Denmark)</td>
<td>385,280</td>
<td>21,250</td>
<td>25,300</td>
</tr>
<tr>
<td>EE (Estonia)</td>
<td>1,470</td>
<td>250</td>
<td>300</td>
</tr>
<tr>
<td>ES (Spain)</td>
<td>964,166</td>
<td>106,000</td>
<td>173,000</td>
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<tr>
<td>FI (Finland)</td>
<td>20,400</td>
<td>2,383</td>
<td>3,200</td>
</tr>
<tr>
<td>FR (France)</td>
<td>879,400</td>
<td>123,500</td>
<td>220,000</td>
</tr>
<tr>
<td>GR (Greece)</td>
<td>3,570,200</td>
<td>2,208,000</td>
<td>2,480,000</td>
</tr>
<tr>
<td>HU (Hungary)</td>
<td>16,250</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>IE (Ireland)</td>
<td>30,790</td>
<td>3,500</td>
<td>5,000</td>
</tr>
<tr>
<td>IT (Italy)</td>
<td>1,100,230</td>
<td>127,059</td>
<td>186,000</td>
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<tr>
<td>LT (Lithuania)</td>
<td>3,450</td>
<td>500</td>
<td>600</td>
</tr>
<tr>
<td>LU (Luxembourg)</td>
<td>18,900</td>
<td>1,900</td>
<td>2,500</td>
</tr>
<tr>
<td>LV (Latvia)</td>
<td>5,350</td>
<td>1,000</td>
<td>1,200</td>
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<tr>
<td>MT (Malta)</td>
<td>20,300</td>
<td>4,000</td>
<td>4,500</td>
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<tr>
<td>NL (Netherlands)</td>
<td>558,183</td>
<td>20,486</td>
<td>14,486</td>
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<tr>
<td>PL (Poland)</td>
<td>254,897</td>
<td>27,780</td>
<td>41,600</td>
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<tr>
<td>PT (Portugal)</td>
<td>285,950</td>
<td>16,000</td>
<td>20,000</td>
</tr>
<tr>
<td>RO (Romania)</td>
<td>69,600</td>
<td>450</td>
<td>400</td>
</tr>
<tr>
<td>SE (Sweden)</td>
<td>262,394</td>
<td>27,621</td>
<td>38,519</td>
</tr>
<tr>
<td>SI (Slovenia)</td>
<td>121,300</td>
<td>4,800</td>
<td>6,900</td>
</tr>
<tr>
<td>SK (Slovakia)</td>
<td>17,220</td>
<td>7,500</td>
<td>8,500</td>
</tr>
<tr>
<td>UK (United Kingdom)</td>
<td>309,920</td>
<td>20,000</td>
<td>54,000</td>
</tr>
<tr>
<td>EU27 + CH</td>
<td>21,957,446</td>
<td>2,049,297</td>
<td>3,003,422</td>
</tr>
</tbody>
</table>

**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 m² collector area, 120-220 lt storage tank.
  - Average size: 2.4m² 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

- 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, I nofita 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 Peultitselis, 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
THERMOELEKTRIKI, 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 Metallourgy, Kilkis, info@mevaco.com.gr
BARDAKIS, Electrical Resistances, Patra, info@pyraelectric.gr
KSULINAKIS-NOBEL, Athens, www.nobel.gr
PAPAEMANUEL, Athens, www.papaemmanouel.gr
POLYFORMA, Polysterene, polyforma@otenet.gr
PRIME LASER TECHNOLOGY, Athens, www.primeberlaser.gr
ROMINA, Athens, mmavra@lee.gr
SAMMLER, Athens, www.sammler.gr
SHE, www.she.com.gr
SIELINE, Athens, www.sieline.gr
SOL, Athens, www.sonne.gr
STIEBETHERM, Athens, www.elitherm.gr
CHRISTIDIS, Metallurgy, Athens, christisa@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
BONAIR: mkara@bonair.gr