

# Greek Solar Thermal Market

## TRANSOLAR – Bucharest

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Market Development in Greece  
Tools Awareness & International  
Trade

**PANOS KONSTANTINIDES**

- DIRECTOR OF CALPAK COMPANY
- PERMANENT MEMBER OF EBHE



# Greek Solar Thermal Market

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- One of the most successful countries worldwide in Solar System installations
- First European country where solar thermal technology became a commercially viable application



# Greek Solar Industry Association

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# GSIA (EBHE) Members

Est. 1979



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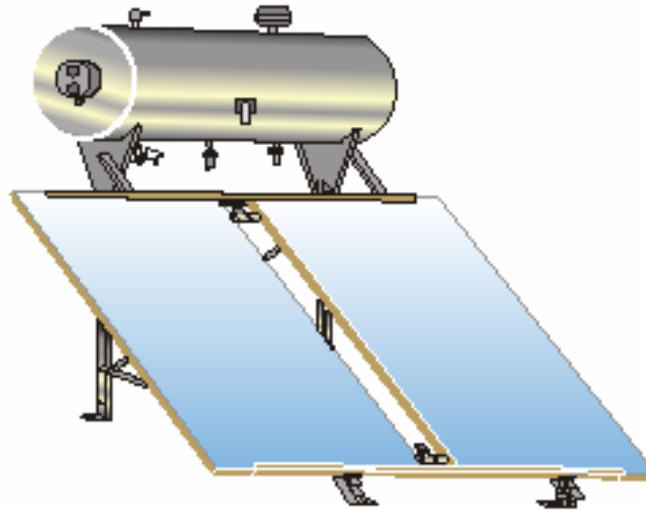


# Products in Greece

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- Solar water heater Thermosiphonic 85% (stable market)
  - multi-apartment buildings
  - small houses
- Central pump systems 15% (positive trend)
  - big houses (DHW and space heating)
  - swimming pools
  - solar cooling
  - hotels
  - hospitals
  - industries

# Thermosiphonic Water Heater





# Thermosiphonic Water Heater

## WHY thermosiphonic systems are so popular in Greece?

- Can be easily installed in either flat roof or slope roof
- Inexpensive and fast installation
  - installers are very well trained and skilled
- Low acquisition cost
- Low maintenance cost
- High energy performance
- Positive net present value

Thermosiphonic system 160/3M

### Economic Efficiency Calculation

#### System

System Yield : 1 577,43 kW/h  
Annual Fuel Savings : 184,93 m<sup>3</sup>

#### Economic Efficiency Parameters

Life Span : 25 years  
Interest on Capital : 2,5 %  
Price Increase Rate – Energy Use : 3,3 %

#### Costs (Cash Value)

Investments : - 1250 €  
Saving : 3 472 €  
Running Costs : - 478 €

**Net Present Value : 1743 €**

**Cost of Solar Energy : 0,06 €/kWh**

# DHW Pump System





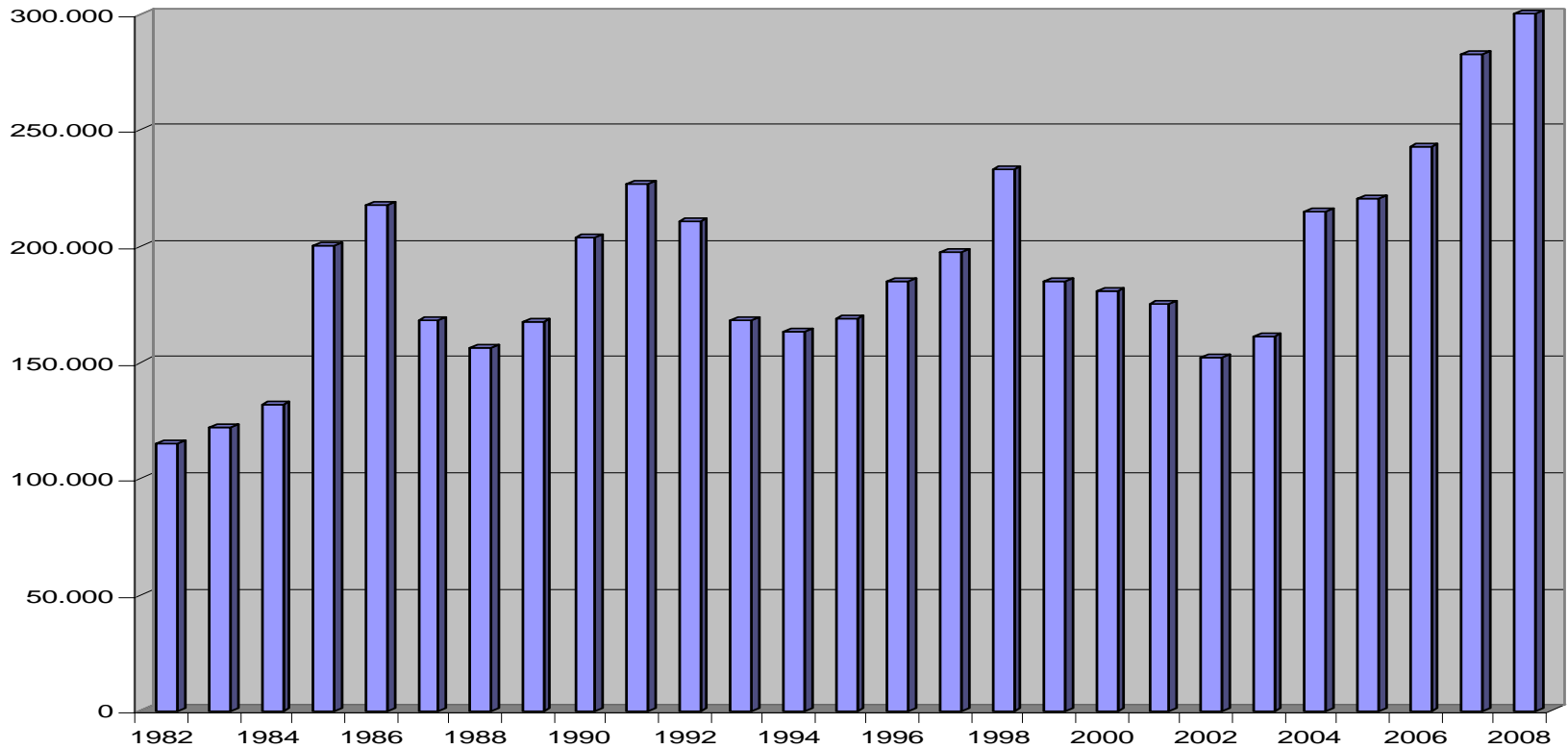
# Bigger Pump Systems





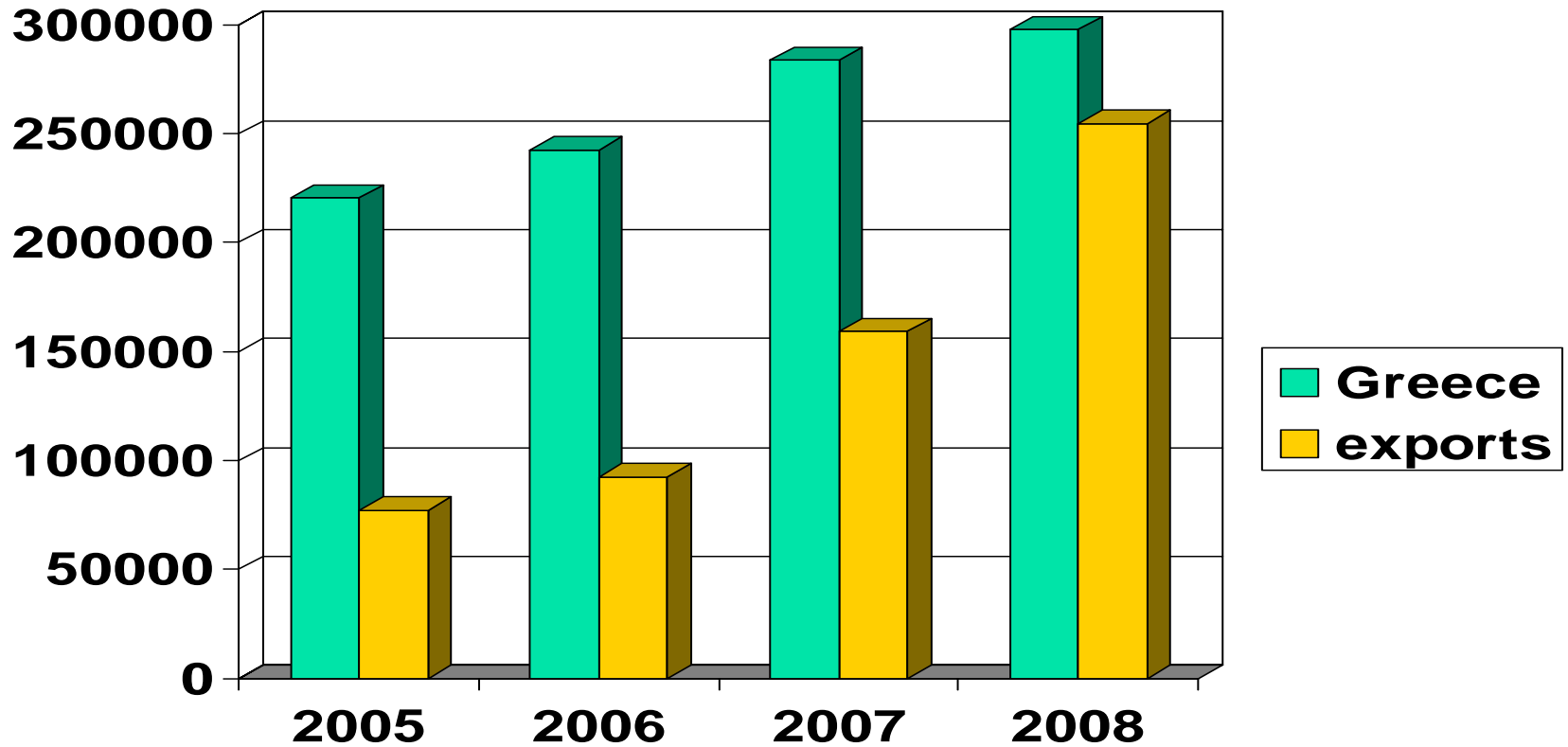
# GREEK SOLAR MARKET SALES

**Greek Solar Market**

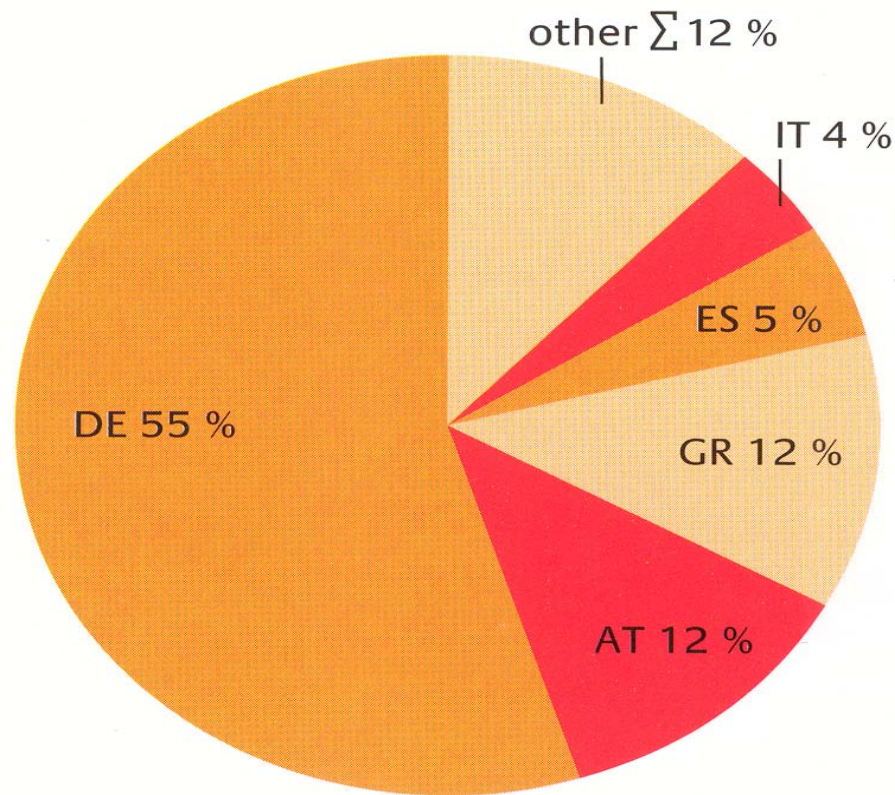




# TOTAL GREEK PRODUCTION

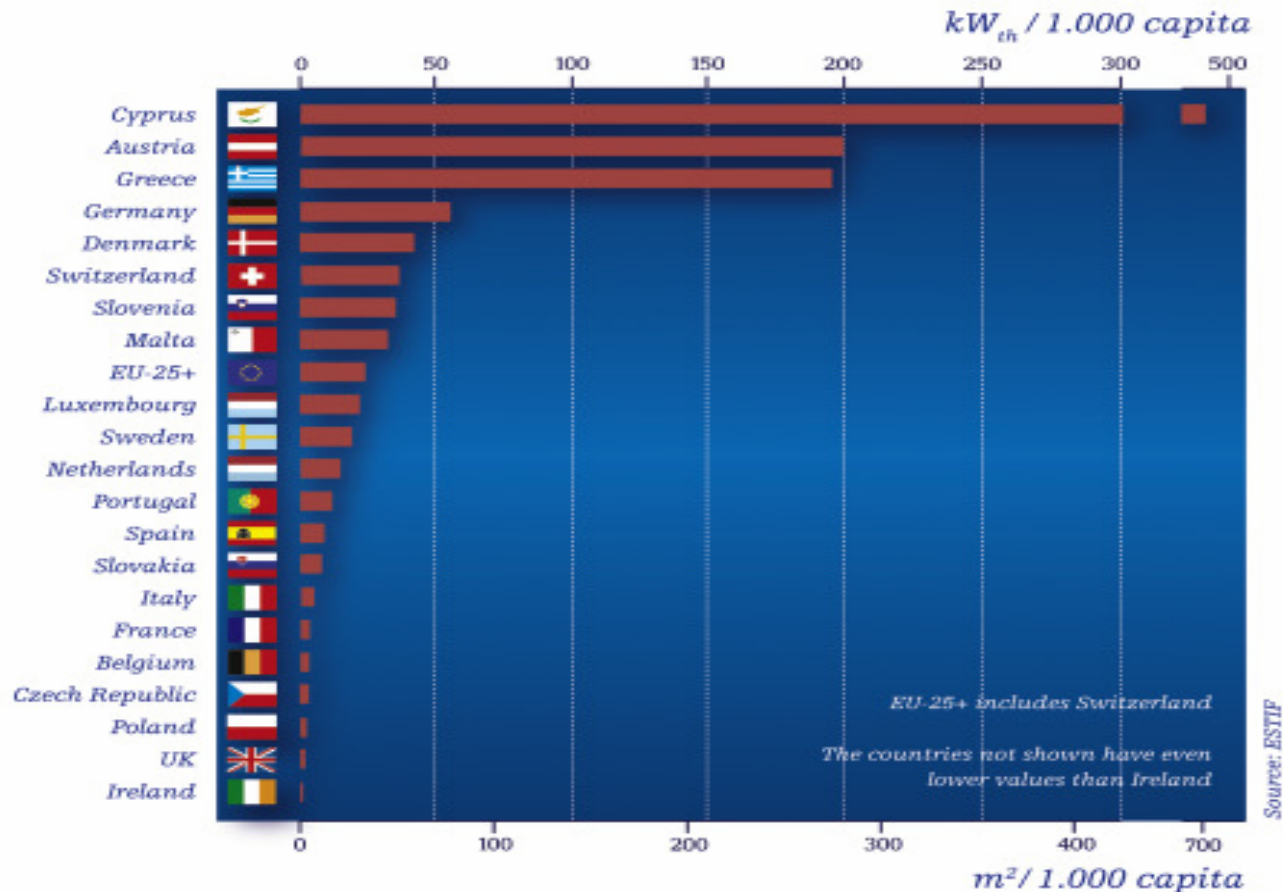


# EUROPEAN SOLAR THERMAL MARKET AS OF 2008



# World Solar Thermal Market in $m^2/1000$ habitants as of 2008

Solar thermal capacity  
in operation per capita (End of 2005)





# GREEK FIGURES - 2008

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## Installed collector area

- 3.550.000 m<sup>2</sup> or 2.485.000 kW

## Yearly savings

- 1.952.500 MWh
- 2.000.000 tn CO<sub>2</sub>
- 3.300 jobs
- 250.000.000 € turnover/year



# COMPARISON BETWEEN GREEK SOLAR MARKET & THE REST OF EUROPE -2008

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	<u>GREECE</u>	<u>EUROPE</u>
■ SOLAR COLLECTOR IN USE (m2)	3,5 mil.	21 mil.
■ OIL CONSERVATION (TONS/YEARS)	310 th	1820 th
■ DIMINATION OF POLLUTION (TONS/YEARS)	800 th	5200 th
■ INSTALLED POWER (MW)	2485	15200



# Critical success factors

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- Initialization of the market by well established companies (Calpak-BP, Siemens, Stiebel Eltron)
- Subsidies given by the State
- Credit policy of the Banks
- National promotional campaigns for public awareness
- Competition





# Advertising & Awareness Campaigns in Greece

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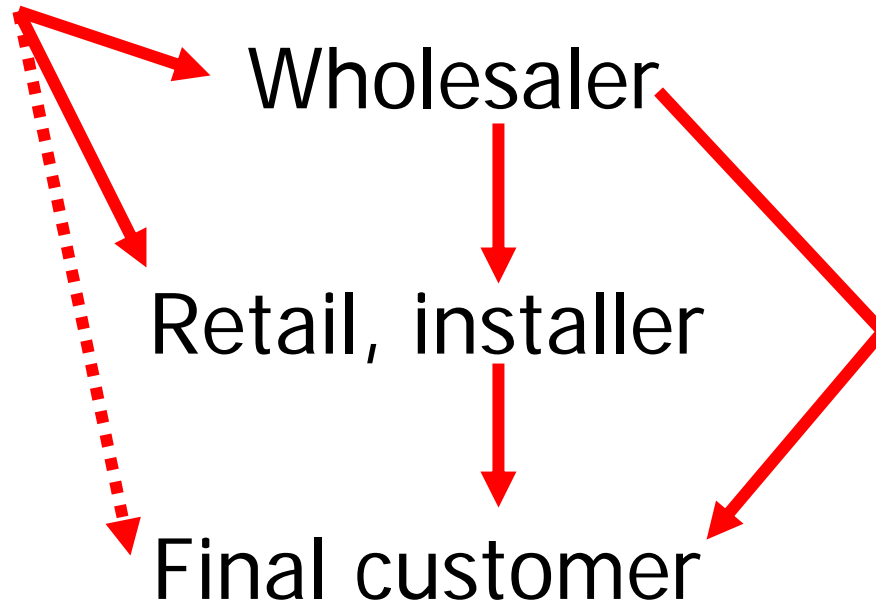
- 1979-1981 Industry, State  
(benefits of solar energy)
- 1984-1985 Industry, State  
(benefits on the economy)
- 1995 Public Power Corporation



# Market Structure Nowadays

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Manufacturer





## Till Now Awareness for Solar

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- **Hot water** : Is Completed
- **Process heat** : Not satisfactory yet
- **Space heating** : Only 'futuristic'
- **Solar cooling** : 'Startup phase'
- Other in project level (drying, etc.)



# International Trade

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## Positive

- Incentives given (tax credit, subsidies etc)
- New European directive for thermal renewable energy (RES-H)
- European standards & safety requirements (CE mark)
- Solar Keymark



## Negative

- National & regional requirements (barriers to entry)
- Low public awareness
- High installation cost (Lack of experienced installers)



## Exported Products

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- **Solar water heaters** (Mediterranean region, 37 countries all over)
- **Complete DHW central systems** (Western and Central Europe)
- **Solar collectors** (Globally, mainly Europe)
- **Solar tanks and floor standing boilers-** (Mediterranean region)
- **Absorbers, etc.** (Eastern Europe)



# Key to Enlarge Solar Market

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**Simple and long term rules for subsidies**



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