

Solar Heating and Cooling Market and Industry Trends



Thermosiphon solar systems in Greece:
An analysis of a success story



Vassiliki DROSOU, PhD.
Head of Solar Thermal Systems Dept. CRES
SKN Manager
CEN/TC312 Secretary

Greece

In Greek: **Ελλάδα**, known also as **Hellas**

Population: approx. 10.7 million

Capital: Athens

Area: 131,957 km²

Located in Southeast Europe, on the southern tip of the Balkan Peninsula

GHI: 1450 kWh/m² ~ 1800 kWh/m²





Solar Thermal: key figures

INSTALLED CAPACITY

3,407 MW_{th}

4,867,500 m² collector area

3,325 GWh/a energy yield

2019 NEW SYSTEMS

361,500 m² collector area

10% increase compared to 2018

TYPICAL SYSTEM

Thermosiphon

storage 2-4 m² selective flat plate collector SOLAR FRACTION

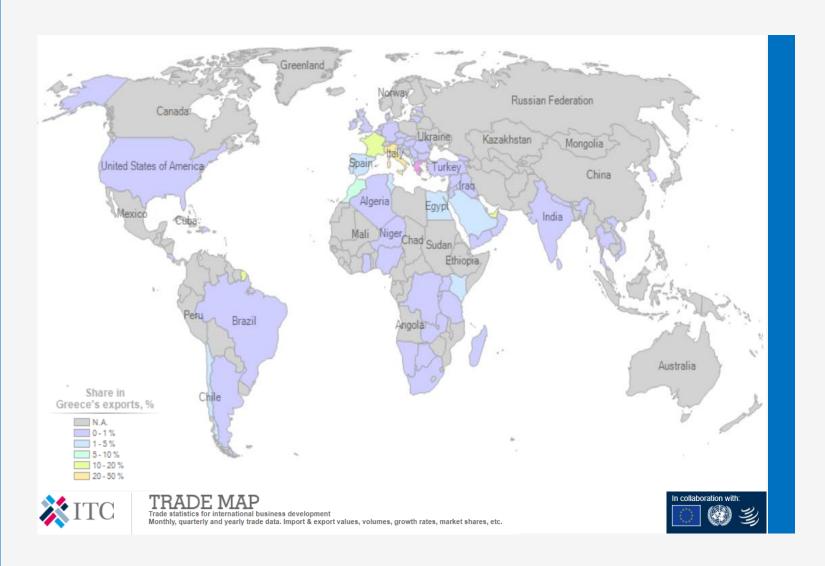
80-90%

of the yearly sanitary hot water needs of a single family

Domestic and exporting market

Greek manufacturers export more than 50% of their production









THERMOSIPHON SYSTEM

- ✓ Highly efficient
- ✓ Easy to install
- ✓ Independence from other users
- ✓ Good value for money
- ✓ Long life
- ✓ Low maintenance
- ✓ Safe

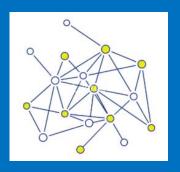




Growth of the branch



Competitive



Extended

1970s: Domestic manufacturing Establishment of Greek solar thermal industry – EBHE (GSIA)

1970s: Impact of rising energy prices due to the oil crises

1980s: Successful big installations

1980s: Promotional campaigns and incentives in form of tax reductions and low interest loans

Historical milestones



CEN TC 312

Thermal solar systems and components



Solar Keymark

10%

Of active **SKN** licenses are awarder to **Greek** products

Ownership rate in Greece in excess of 75%.

The typical Greek consumer prefers a high degree of autonomy

Most urban buildings feature flat roofs, highly suitable for installation





Governmental support

"Regulation on the Energy Performance of Buildings" 60%

of hot water needs in domestic sector must covered by a solar thermal system (since 2010)

"Saving Energy at Home I and II" programs"

70%

installation costs of a solar thermal system for hot water production are funded by up to 70%

PV with solar thermal

The installation of PVs is allowed **only** upon the prerequisite that a solar thermal system is being used for hot water production



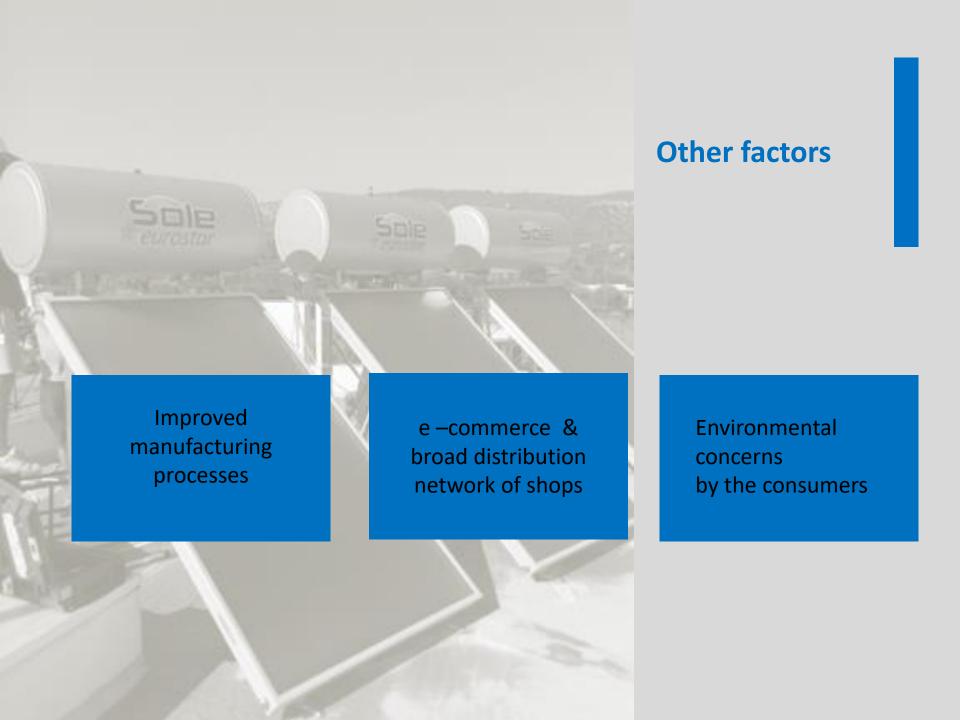
New buildings Renovations



Electricity and oil price increase



Price reduction of solar thermal products



Numbers to remember

1700kg/a CO₂ avoided emissions by a thermosiphon system

1400kg/a CO₂ avoided emissions by an electric car

Solar collector $\sim 675 \text{kgr CO}_2/\text{m}_2\text{y}$ Electric car $\sim 120 \text{gr/km}$.

References

- DROSOU V., TRAVASAROS C., PAPADOPOULOS, A.M., Thermosiphon solar systems in Greece: An analysis of a success story, 13th Eurosun International Conference on Solar Energy for Buildings and Industry, 1 – 4 September 2020, Virtual Conference (Invited presentation)
- EBHE <u>www.ebhe.gr</u>

Pictures: Cover SOLE, p.3 CALPAK, p.4 SOLE, p.6 (up) PAPAEMMANOUEL, p.6 (down) COSMOSOLAR, p.7 MALTEZOS, p.10 SOLE, p.11 MELPO, p.13 SOLE, p14 PAPAEMMANOUEL.

Thank you for supporting solar thermal technology!

drosou@cres.gr