



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

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

150-300 l
storage

2-4 m²
selective flat
plate collector

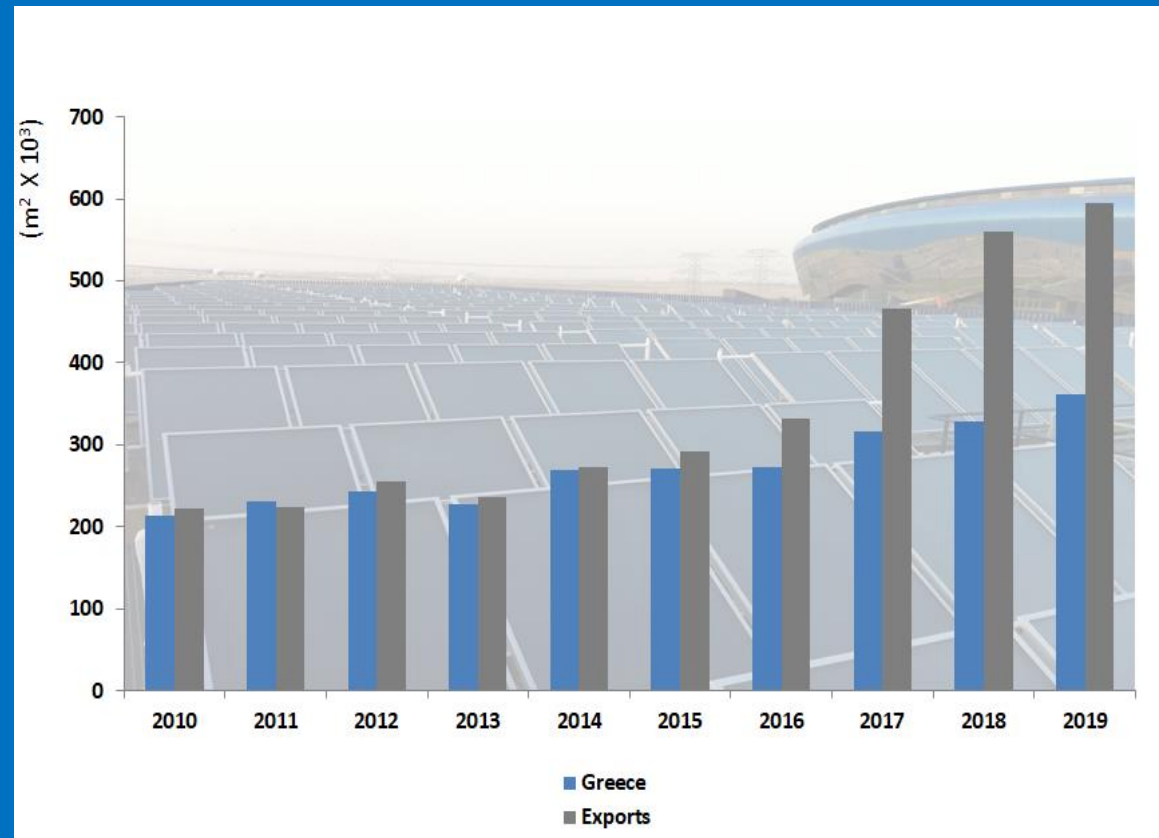
SOLAR FRACTION

80-90%

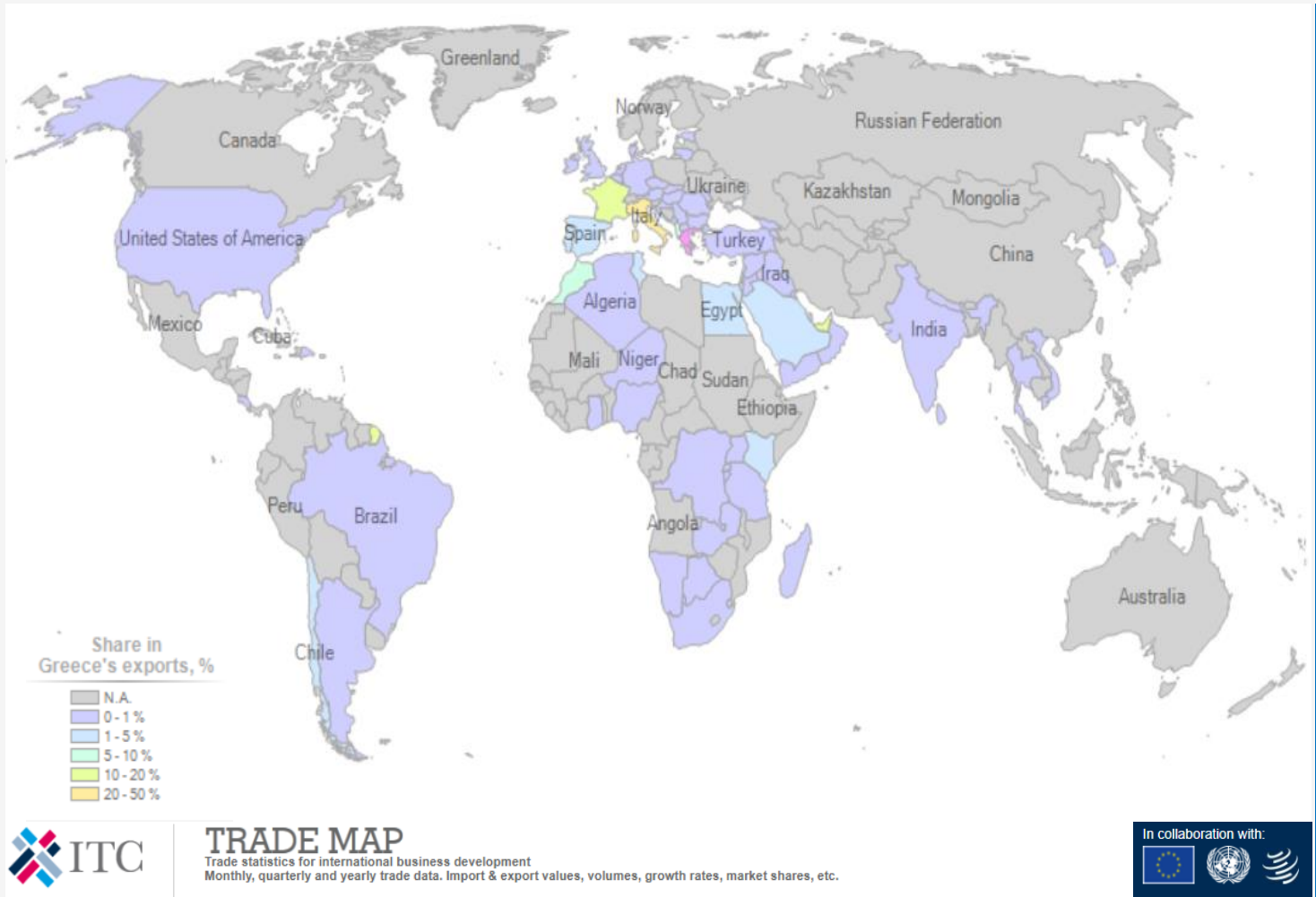
of the yearly
sanitary hot
water needs of
a single family

Domestic and exporting market

Greek manufacturers export more than 50% of their production



Importing markets for Solar Thermal products (2019)





THERMOSIPHON SYSTEM

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

MALTEZOS

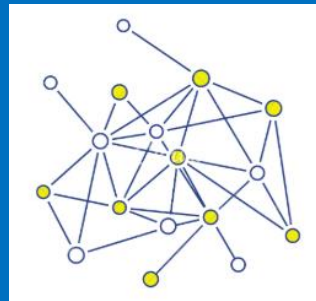
Greek market



Growth of the branch



Competitive



Extended

Historical milestones

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

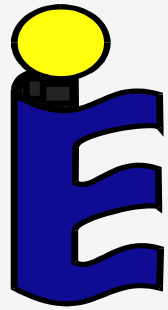
1980s: Promotional campaigns and incentives in form of tax reductions and low interest loans

Standardization



CEN TC 312

Thermal solar systems
and components



Solar Keymark

10%

Of active **SKN** licenses
are awarded 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

Buildings





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

After economic recession



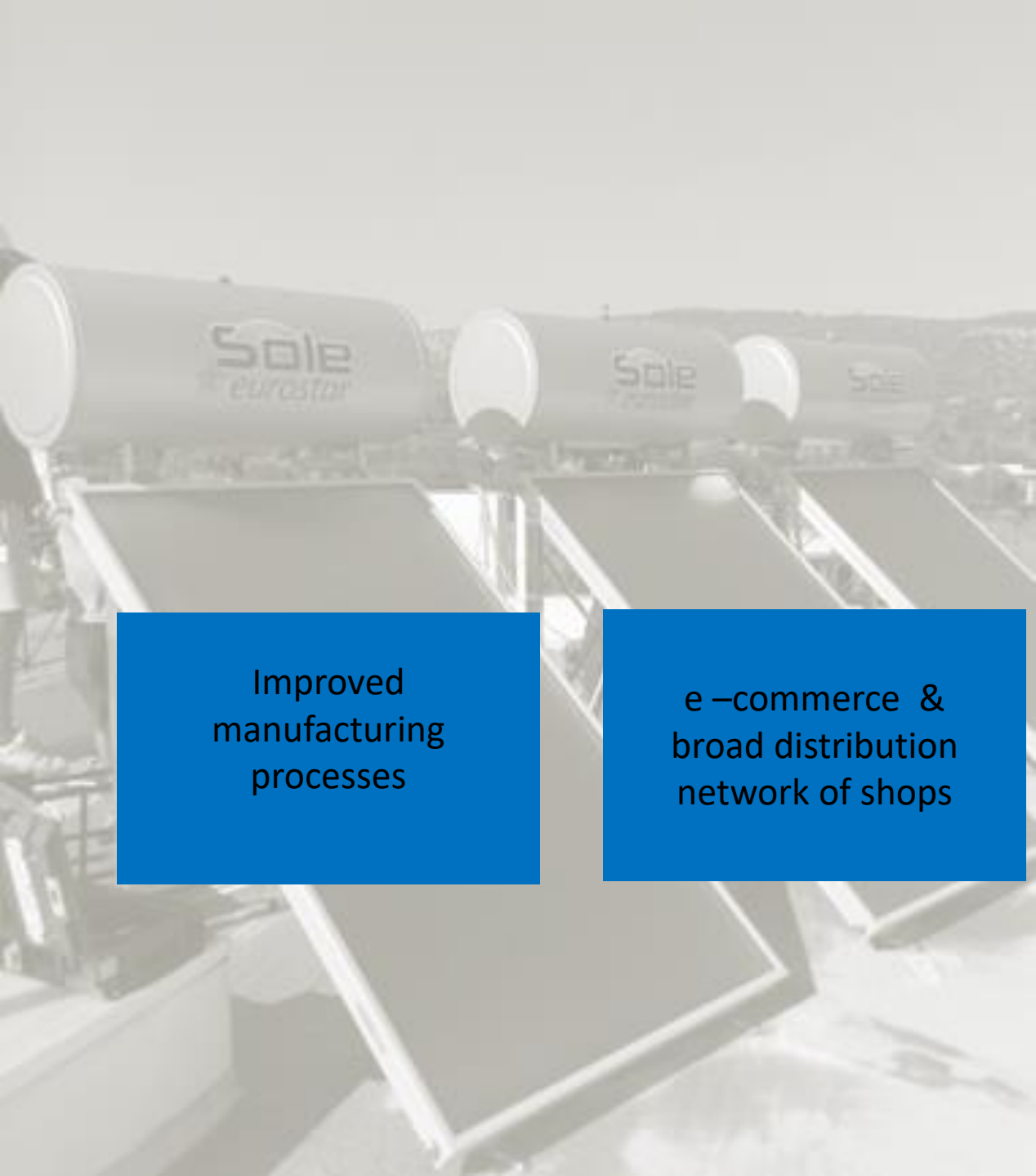
New buildings
Renovations



Electricity and oil price increase



Price reduction of solar thermal products



Other factors

Improved
manufacturing
processes

e-commerce &
broad distribution
network of shops

Environmental
concerns
by the consumers

Numbers to remember

1700kg/a CO₂
avoided emissions by a
thermosiphon system



1400kg/a CO₂
avoided emissions by
an electric car



Solar collector ~ 675kg CO₂/m₂y
Electric car ~ 120gr/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 www.ebhe.gr

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!

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