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# The influence of Energy Policy Instruments upon the Promotion of Solar Thermal Technology in Greece

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# Objectives



- To examine the *existing Solar Thermal (ST) market in Greece*.
  - To study and elaborate *existing policy framework in Greece* and in other *EU countries*.
- 
- To identify the *potential for promoting ST technology through* the introduction of appropriate *policy instruments*.
- 
- To provide a set of *guidelines on policy instruments* suitable for Greece that is expected *to change the citizens' behaviour towards the use of ST technology*.

# Solar Thermal Market in Greece



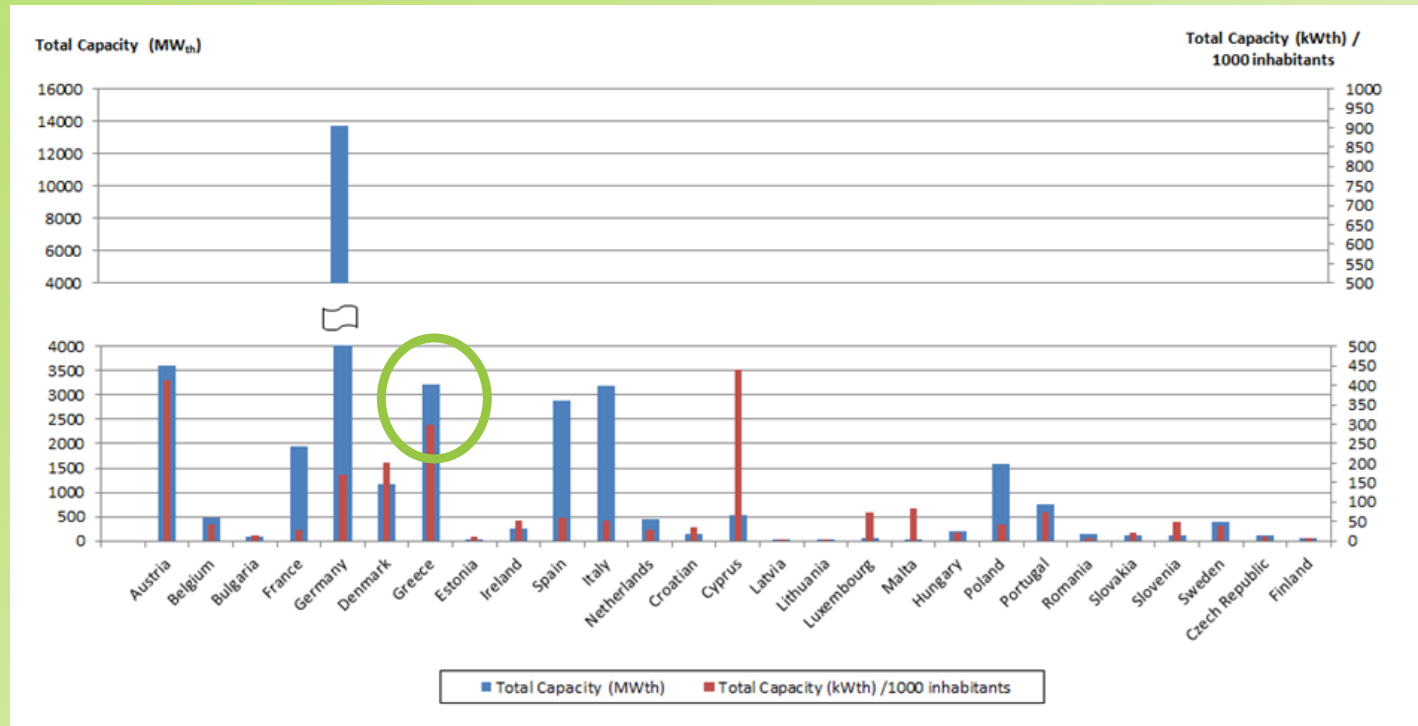
- Solar Thermal (ST) systems categories:
  - ***Non-concentrating for low and medium temperatures*** of fluid production.
  - ***Concentrating for medium and high temperatures*** of fluid production.
- In Greece:
  - ST technology ***for low and medium temperature*** is a technology with ***high potential*** in terms of ***energy savings*** and ***cost effectiveness***.
  - ***Concentrating Solar Thermal*** (CST) systems for electricity production:
    - There are some ***pilot CST*** installations.
    - ***No facilities in commercial level.***
    - Expected to change in the coming years, as the national target for 2030 is 260 GWh electricity production from CST.



# Solar Thermal Market in Greece



- Total ***ST installed capacity in operation in 2017***, for low and medium temperature applications, is ***3.2 GW<sub>th</sub>*** (4,618,000 m<sup>2</sup> of solar collective area).
- Greece is ranked at the ***3<sup>rd</sup> place in EU27*** in both terms - ***total ST capacity in operation in 2017*** and ***total capacity per capita*** - revealing its well-established ST market.

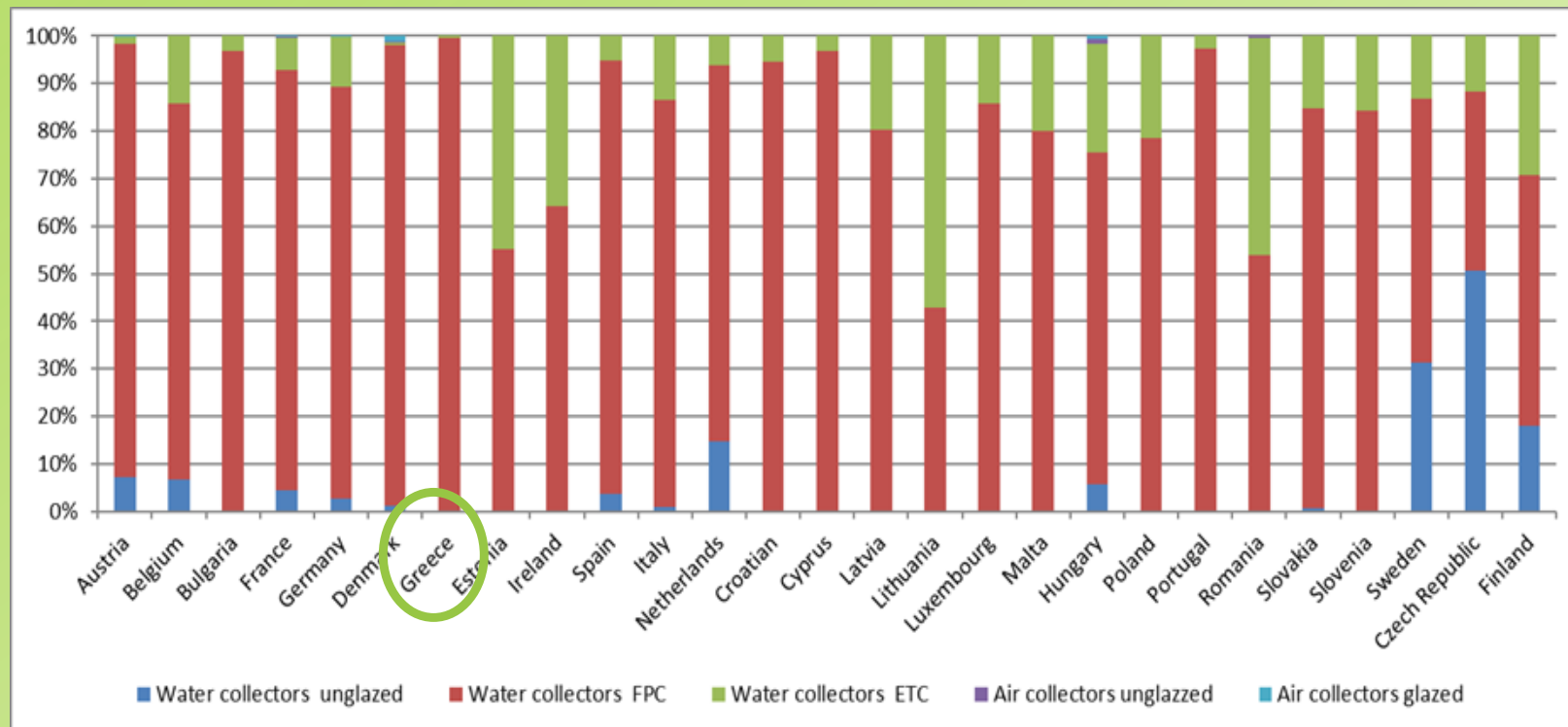


Data source: Elaborated data of Solar heat worldwide: Global Market Development and Trends in 2018 - Detailed Market Figures 2017, IEA Solar Heating and Cooling Programme (2019)

# Solar Thermal Market in Greece



- ***Distribution by technology*** of total installed collector area in operation in 2017.

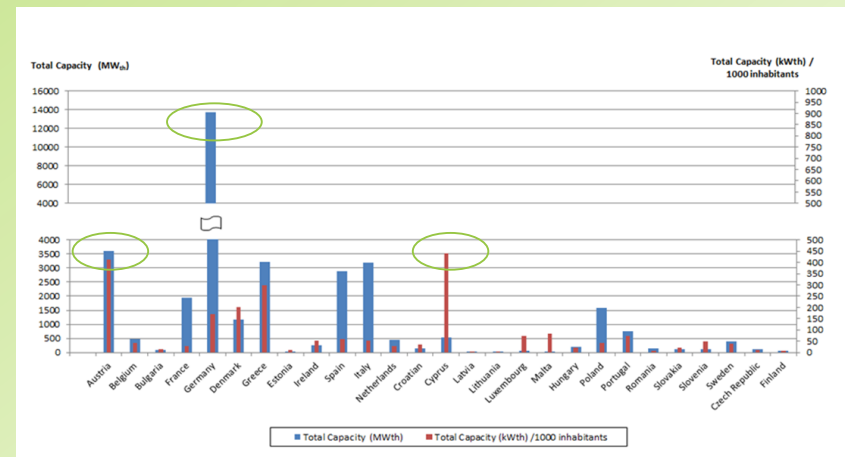


Data source: Elaborated data of Solar heat worldwide: Global Market Development and Trends in 2018 - Detailed Market Figures 2017, IEA Solar Heating and Cooling Programme (2019)

# Methodology



- **Past and ongoing policy strategies** were identified and their success were assessed.
- **Barriers** that prevent the dissemination of ST systems were examined and **recommendations** for overcoming them are suggested.
- **Best practices** currently applied in other EU countries – such as Germany, Austria and Cyprus - were studied and the most suitable ones **were selected to be applied in Greece**.



# Findings - Existing policy framework in Greece



- The *Greek policy instruments* for ST market deployment *are limited* and mostly *addressed to RES technologies* and *not directly to ST systems*.
- They include proper *regulatory framework, incentives* and *funding opportunities* aiming at improving energy efficiency meeting the targets set by EU and thus *promoting sustainable energy behaviour*.



# Findings - Existing policy framework in Greece



## ■ Indicative regulatory framework:

- **Law 4342/2015**, Part B Integration of the European Energy Efficiency Directive 2012/27/EU.
- **Law 3851/2010**: Accelerating the development of Renewable Energy to address climate change and other provisions on jurisdiction of the Ministry of Environment, Energy and Climate Change.
- **Law 3468/2006**: Electricity production by RES and high-efficiency cogeneration and other provisions.

## ■ Market-oriented policy instruments:

- **“Infrastructure Fund”**, aiming at maximizing the use of financial instruments, in the field of energy saving and promotion of RES.
- **“Greek Development Law 4399/2016”**, aiming at encouraging investments, mainly in the field of manufacturing and energy, covering up to 55% of eligible costs.

# Results and discussion



- The ***well-established ST market*** for low and medium temperatures, is - among others - ***a result of policy instruments*** established in the early 1980s.
  - Successful marketing campaigns and fiscal incentives, such as low-interest loans and tax credits (VAT exception), were enforced.
- The ***vast majority of installed systems in Greece*** (more than 95%) are the simplest type of the technology thus the ***thermosiphon system for domestic hot water production***.
- The effective ***expansion of ST technology use in more complex systems*** for ***heating and cooling***, as well as for other applications such as ***Solar Heat Industrial Processes*** (SHIP) and ***electricity production***, requires effective implementation of ***proper national policy instruments***.

# Guidelines for promoting ST systems in Greece



- The ***national energy targets***, foreseen in the Greek National Energy and Climate Plans, should be realized by ***specific policy measures*** including ST systems.
- ***Best ST practices*** in other countries should be studied and ***adopted in Greece***.
- ***More financial support programs***, addressed directly to ST systems ***for heating and cooling, SHIP*** and ST ***electricity production***, should be applied.
- ***Implementation of market-oriented financial support schemes***, including subsidy measures (tax credits and exemptions, preferential interest rates , etc.) to prospective investors proving energy saving potential, achieved by ST installations.

# Guidelines for promoting ST systems in Greece



- Deployment of Greek legislative framework – concerning the conduction of **energy audits** and the mandatory energy efficiency interventions including ST systems – **not only to large** but to **all size enterprises**.
- Investigating and establishing **policy instruments, tackling Energy Poverty in Greece**, in order to achieve economic and social cohesion.
- Supporting of **pilot actions** under a specific market strategy that would foresee and **anticipate the replication of ST interventions**.



# Conclusions



- Policy instruments should aim to *change the behaviour of end- users* towards the *adoption of ST applications*.
- *Current policy framework* in Greece does not explicitly address to solar thermal technologies, but it does *provide possibilities for interventions* in this field through the policy framework for *RES in general*.
- It is important to *identify* and *disseminate these policy instruments*, applicable to solar thermal interventions, in order to change citizens' behaviour towards the use of sustainable energy and energy efficiency.
- This study, *provides a set of guidelines*, in order to reinforce the ST technology implementation in Greece.

# Acknowledgement



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- INSHIP project website: [www.inship.eu](http://www.inship.eu)



**Thank you for your attention**

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