

# Transform! / Akademia Working Group on Energy WORKSHOP For a Democratic European Energy Model

April 18- 19 2015 Brussels

## **Project presentation** **WITH THE SUN OUT OF THE CRISIS** **Increased implementation and development** **of solar-thermal facilities in Greece**



**Josef Baum**

[www.josefbaum.at](http://www.josefbaum.at)

[josef.baum@univie.ac.at](mailto:josef.baum@univie.ac.at)



University of Vienna - Department for East Asian Studies

Altes AKH, Spitalgasse 2-4, Hof 2, 1090 Wien, M: +43 664 1142298

# WITH THE SUN OUT OF THE CRISIS

## Project for the increased implementation and development of solar-thermal facilities in Greece

*Small project preparing a more comprehensive project  
Started in March 2015*

### **Aim of the (small) project:**

The main objective is - after rough evaluation of concrete needs and potentials – to establish a framework for a **bigger comprehensive project**, which shall be specified then in detail subsequently.

Especially appropriate **persons** should be contacted and motivated, and concrete **funds** for a comprehensive project should be identified



# What is solar-thermal energy? Efficiency?

*≠ Photovoltaics!*

Solar thermal collectors usually collect heat by absorbing sunlight (or – when cloudy - only light with newest technology) and basically heat water (primarily for the use of hot water; but also for heating – and cooling! -, and industrial processes (also electricity))

vacuum  
tube



flat  
plate

# Solar-thermal a hidden champion?

≠ *Photovoltaics!* (PV solar panel is something like **15% efficient**)

The transfer of solar energy into heat (of water) can be more than **50% efficient**

**PV** is technologically more challenging (“more sexy”) and can be integrated in big grids

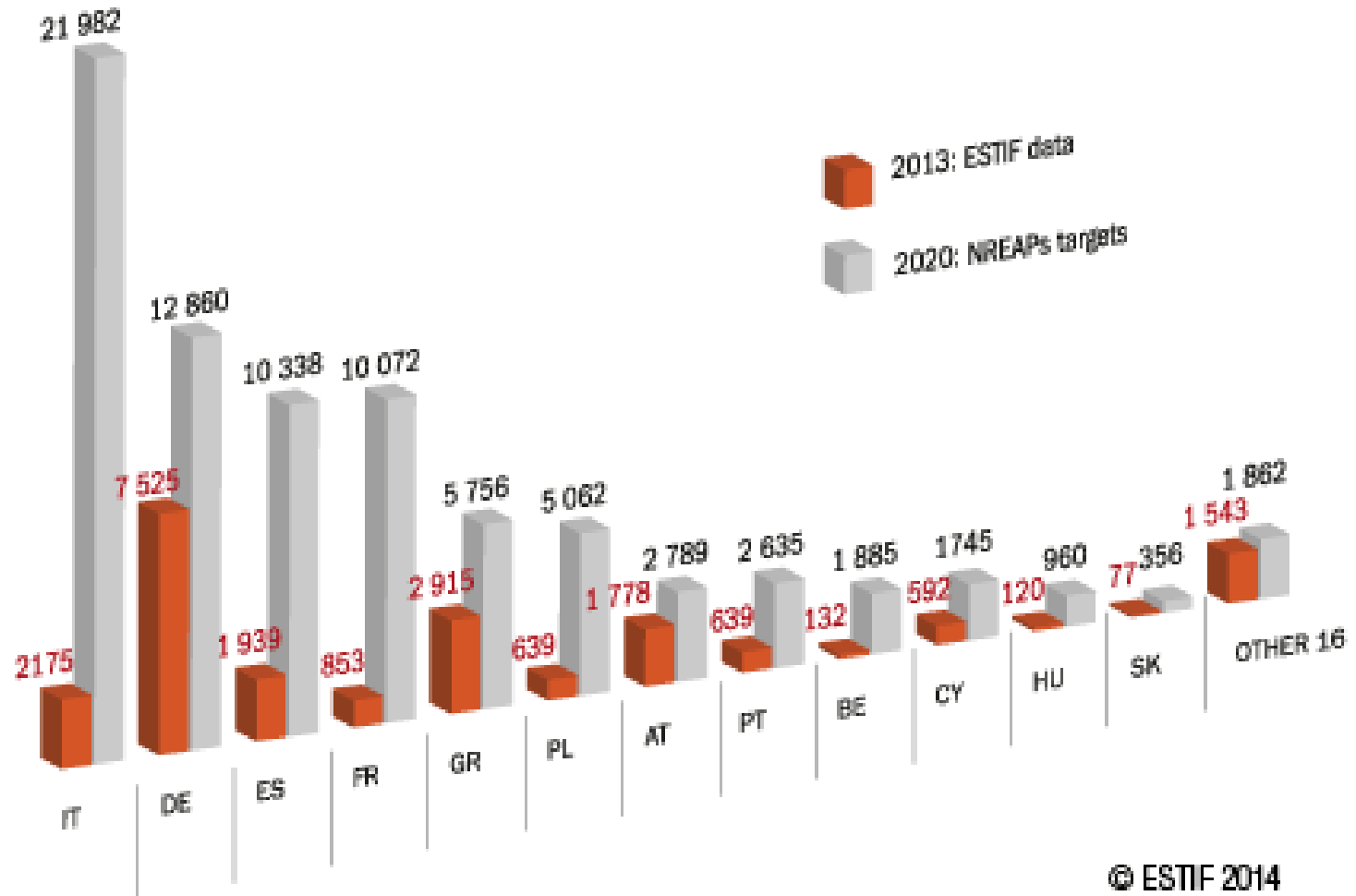
**Solar heat** is more simple in technological terms, the integration into bigger grids is more difficult. But the connection to central heating (via buffer storage) and other systems is more complex and requires more system thinking

**Although significantly cheaper** (than PV) and has high potentials solar heat **often is even not mentioned** specifically in many programs

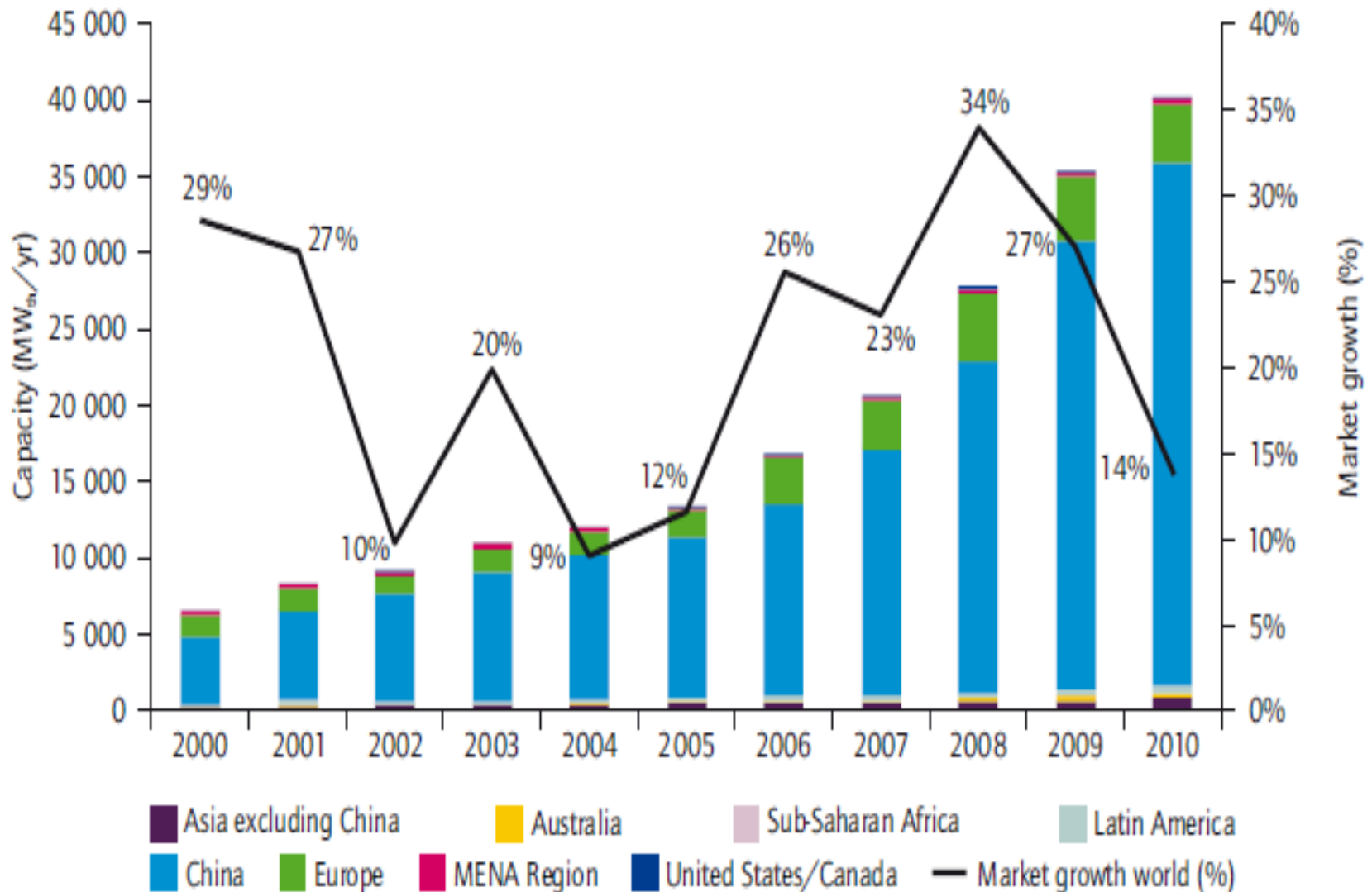


# Solar heat generation in Europe: status and plans

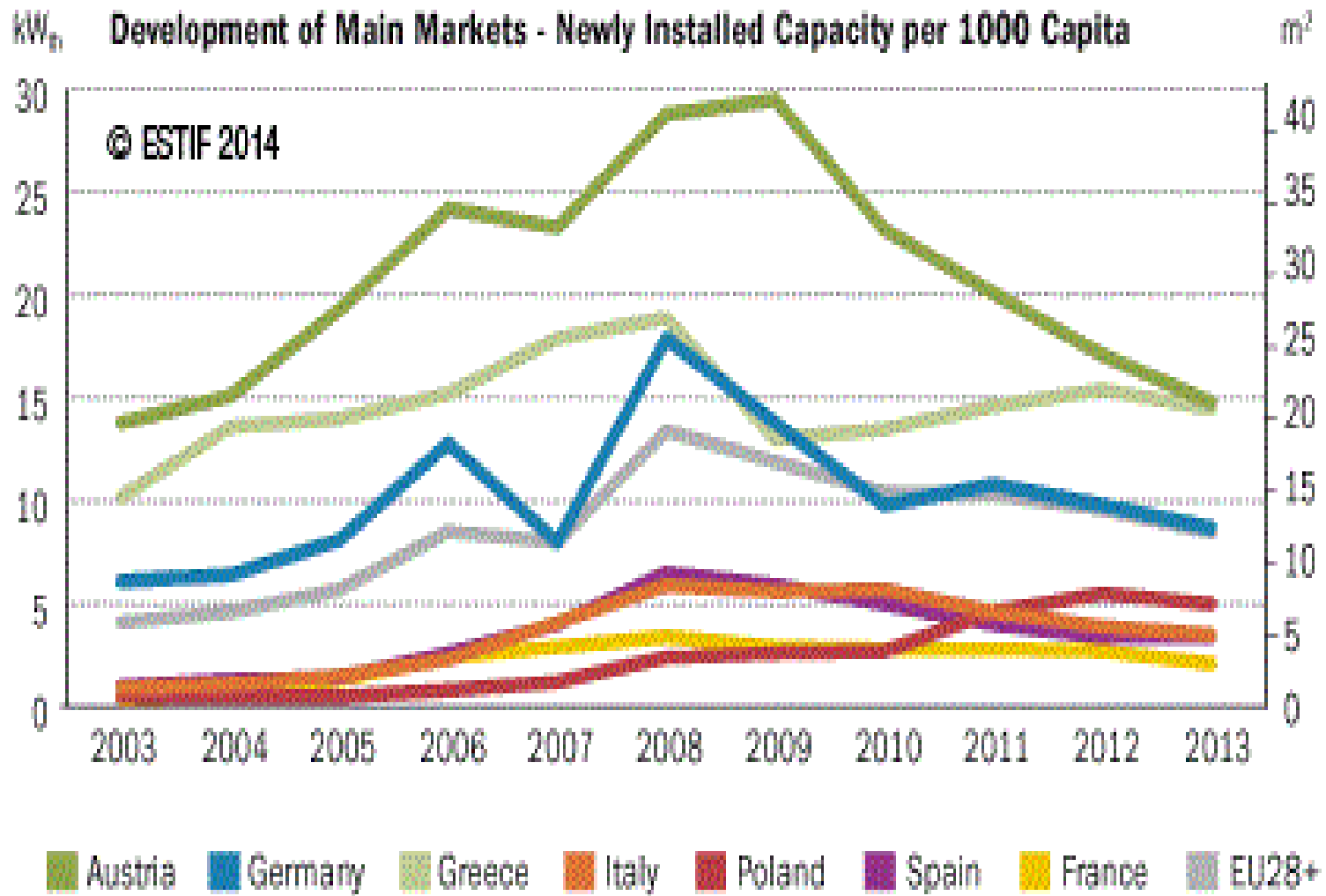
Solar heat generation in Europe



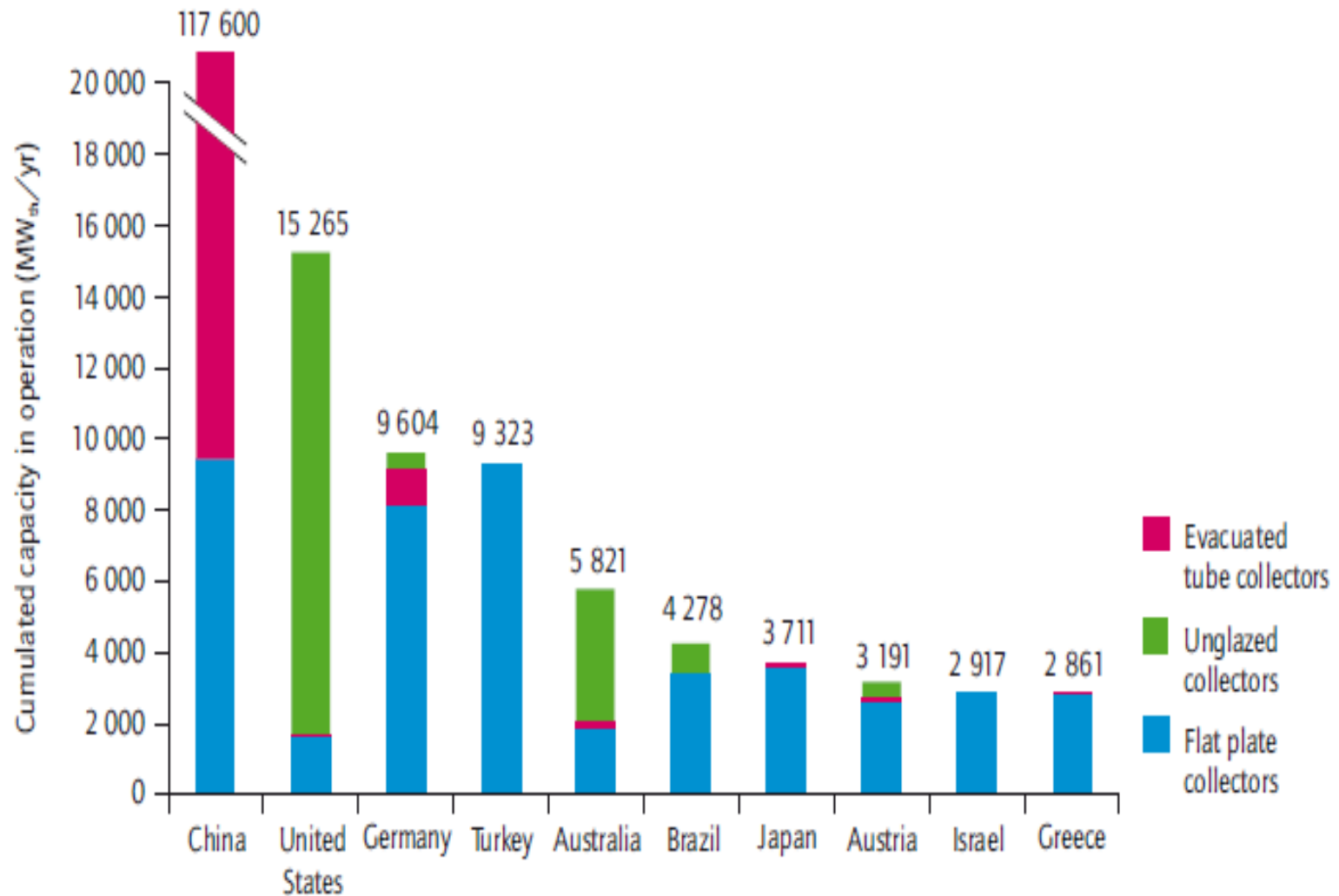
# Annual newly installed capacity of flat-plate and evacuated tube



# Newly Installed Capacity per Capita



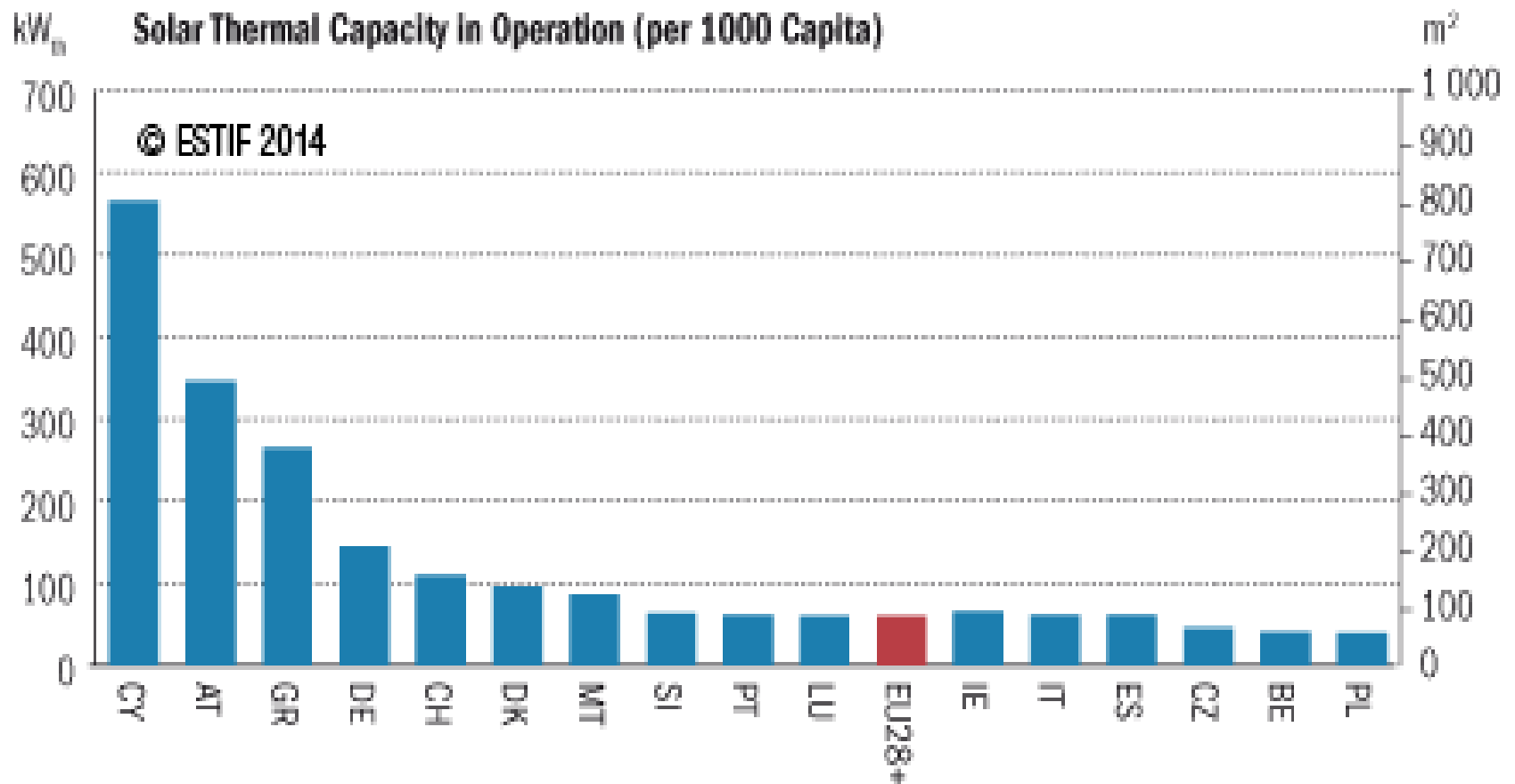
# Total installed capacity of water collectors in operation in 10 leading countries by the end of 2010



Source: Weiss and Mauthner, 2012.



# Solar Thermal Capacity in Operation per Capita



# Status of solar thermal energy in Greece

Renewable energy contributed to 5,3 % of gross inland energy consumption in **2006** and to 18 % (=1,8 Mtoe) of primary energy production in Greece

The share of solar thermal energy in total renewable energy was 6%.

So the **share of solar thermal energy** in gross inland energy consumption was about 0.32 %, and in primary energy production about 1%

*Ministry of development, Hellenic Republic (Feb 2009): Energy Outlook of Greece. P.17*



## ***High Targets for solar thermal systems until 2016***

The Greek plans (before the financial crisis) were 18 % of gross inland energy consumption:

In the household sector by obligatory installation of central solar thermal systems and financial incentives for further small scale solar thermal systems in housing the yearly conservation should have been **tripled** from **2010 to 2016** from 180 to 540 GWh.

Similar targets were set for the tertiary, industrial and public sectors

*Ministry of development, Hellenic Republic (Feb 2009): Energy Outlook of Greece. P.40, 52*



## ***But by crisis low implementation of targets***

- Greece has an solar industry and solar systems are widely used in all types of buildings.
- Basically there is a move from small and medium users from **traditionally used stand-alone thermosiphon systems** (without the necessity of a mechanical pumps) **towards forced circulation ones**, requiring integrated design and implementation of whole system solutions.
- But because of crisis currently **incentives** are **lacking**
- Some technology transfer or RD seems to be necessary especially for large scale systems

*Information by CRES*



Typically the hopefully following **comprehensive bigger project** should **promote implementation and development of solar-thermal facilities in Greece** on the levels of

- **households** (political implications ./.)
- Industry
- SME
- Farming



Typically the hopefully following comprehensive project should promote implementation and development of solar-thermal facilities in Greece by

- **connecting people and generally competence between Greece and other countries** (Knowledge transfer in both directions)
- Maybe **tying to former projects** like “Development of pilot solar thermal energy service companies with high replication potential”
- **consulting** of institutions, communities, households, NGO’s and companies
- evaluate, initiate and **support investments, production and RD**



## Background of the project 1

- The unused **solar-thermal energy potential** of all European countries is big, but **in southern countries evidently very big** according to climatic circumstances Greece
- Comparatively to other countries has already a relatively high degree of use of solar thermal facilities but like in most other countries also in Greece there is still a huge potential (a big multiple of the existing plants)
- **Greece and Austria have** – after Cyprus – **highest use of solar-thermal facilities p.c. in the EU** (In Austria out of self-construction groups starting after anti-nuclear referendum in the late 70ies; Austria currently has significant industrial performance in this field)



## Background of the project 2

- **Greece has had better times of solar-thermal energy** (some 15 years ago) → potential
- **Since crisis** there is a significant **decline in solar-thermal investments** (in Greece and almost all over Europe); in Greece there is a significant rising need of replacement investments
- Substantial **RD in renewable energy** since crisis in Greece **has been converging to zero**
- 





## Background of the project 3

- The importance of support for specific projects in renewable energy in Greece is obvious given the current situation of unemployment and incomes
- Basically for the concrete development available resources should be used to a greater extent.
- Strategies for **endogenous development** especially use endogenous resources. In Greece the **SUN has a specific character as a resource**



## Background of the project 4

- There was a significant positive response to the outline of this project by Alexis Charitsis, (former?) Coordinator of the Energy Department of **SYRIZA**
- Personal connections to **Chinese persons**. HUANG MING (owner of HIMIN, the worldwide biggest solar-thermal company; was awarded the Right Livelihood Award\_2011, drafted the Law on Renewable Energy in China)
- Connections to people in Austria who are dedicated to renewable energy and are open for solidarity projects



## Economic advantages of solar heat

The extended use of the resource SUN in Greece in the solar thermal form will

- relieve the national energy balance (**less imports of fossil energy**) and so the trade balance
- **support SMEs and the regional economy** via installation of solar thermal facilities by local technical firms
- Improve the overall energy efficiency (and economic efficiency)



## Political and socio-ecological advantages of solar heat

The extended use of the resource SUN in Greece in the solar thermal form will

- be a contribution to **decentralization of the energy system** and encourages personal and local initiative and responsibility.
- **recreate** more **trust into renewable** energy generally (after many failed big PV-projects)
- so **empower people** on the ground to sustain livelihood and **energy democracy** and to proceed to further projects (in implementing renewable energy)
- improve the carbon footprint - **less greenhouse gas emissions**



## Social advantages of solar heat

- **relieve the energy bill of many households** - especially in rural areas – because investments in this field usually have a return time within only few years (anyway much faster than PV)
- and can so - embedded in a financial framework e. g. of contracting – **relieve energy poverty**
- Also existing "**old systems**" – usually at poorer people - can be optimized, improved or upgraded through consultation and small investments



## Household level as main pillar – Production and RD as further levels

- Households and small scale plants are important issues because of the social dimension. **Existing solar thermal plants in Greece rather are low tech** and can be improved in efficiency.
- But this focus could be also enlarged: solar heat can also be used for **power production, cooling and supporting heating systems for buildings – also in larger scale units.**
- Newer technologies can use light also in times when the sun is not shining



## Production and RD – Mediterranean perspectives

- Significant **industrial production** of solar thermal facilities or parts is a considerable possibility with different options: **cooperatives, joint ventures, (Chinese) FDI; other forms**)
- **RD** in Greece virtually collapsed in wide areas and has to be revived; thermal solar technology should be developed further and **optimized along the specific Greek conditions**. Greek technicians could thereby be employed
- Greece could emerge by RD and production as **a center of solar thermal competence in the Mediterranean region**



## Assigning a positive function to the financial sector

- A crucial point is the **financing of the increased implementation** of solar thermal systems: although these systems are not overly expensive, a vast majority of households currently cannot afford any investments.
- Here, the financial sector could be **creative in a positive way** and fulfil its specific task of transformation of payments: It can pre-finance investments at households, and people continue to pay their former energy bill or somehow less, and so investments are paid back by energy saving (:=**contracting**).
- **Incentives and grants** are conceivable in various forms





## Designing an European project?

- **Ministries** and other institutions should be obligated for contributions for the purposes of the European idea.
- The project **can be started from Austria** (Industry, activists, institutions)
- **But basically many interested people, NGO's and institutions in many European countries should be integrated**, and it should be tried to tap supranational institutions.
- **Critical question : initial funding**



## Crucial question: green capitalism?

- A general problem is integration of renewable energy in the system of capital accumulation - compromises for the time being probably will be necessary within an political framework
- In particular a sensitive issue is the inclusion of **companies** as cooperation partners (with self-interests) – basically a strong integration into public procedures should be achieved respecting **transparency**
- Anyway the solar thermal technology by its specific has some special potential to promote **decentralisation, empowerment, small scale development, overcoming energy poverty**, last but not least maybe a new relation to natural resources and **it could be a small contribution to a new type of accumulation**



## Further issues

- **Large scale projects** should not be the focus but should also not be out ruled
- Integration of municipalities
- Similar conditions in **Spain** and other southern countries → **transferability**
- **WHO WILL PARTICIPATE, SUPPORT, PROMOTE the project?**
- **Cooperation with Greek Solar Industry Association (EBHE) and Centre for Renewable Energy Sources and Saving (CRESS)**

