# THE EUROPEAN AND GREEK DIMENSIONS OF RENEWABLE HEATING AND COOLING

**Prof. Yannis Maniatis,**

**fr. Minister of Environment, Energy and Climate Change**

Dear friends,

In line with the ambitious goal of climate neutrality, as expressed through the European Green Deal, the EU and Greek economies need to follow a path of drastic decarbonization in all sectors of energy production, from electricity generation, up to heating / cooling and transportation, while remaining as autonomous and energy-secure as possible.

Heating and Cooling (H&C) represents almost half of the EU's final energy consumption and carbon sequestration has been identified as a priority at EU level.

Fit for 55 (FF55) strategy, an important intermediate step towards climate neutrality, aims to achieve a reduction of greenhouse gas emissions by 55% by 2030 compared to 1990 levels. It is therefore an opportunity to take measures to upgrade obsolete heating plants and installations with modern renewables, such as biothermal, geothermal, solar thermal, district heating and heat pumps. These modern and sustainable solutions increase energy efficiency, reduce emissions and tackle air pollution.

In most EU countries, at least 25% of heating installations are over 30 years old. In fact, in some of the countries, the percentage of age exceeds 33%, which means that 1 in 3 facilities do not currently conform to modern requirements and specifications. Therefore, a faster rate of replacement is needed to meet both the 2050 final target, as well as the intermediate end-of-the-decade targets of climate neutrality.

According to recent statistics (2019), the heating-cooling sector continues to be largely dominated (around 78%) by fossil fuels, with 136 million tons of oil equivalent coming from non-renewable sources, mainly fossil gas. In the same year, heat from Biomass (Bioheat) contributed 17% of total energy sources and represented 85% of the total consumption of renewable heating and cooling, eliminating the emission of 160 million tons of CO2 equivalent. This amount of emission savings corresponds, for example, to the combined annual greenhouse gas emissions of Belgium and Slovakia, which shows the dynamics of the contribution of biothermal energy to the objectives of the European Green Deal.

Another important and yet to be developed renewable energy source for Heating and Cooling is **Solar Heat**. For this issue, I start with five short remarks:

**1.** It is a European driven renewable technology that with a cost of €1.000, saves the same amount of CO2 with the CO2 saving of an electric car that costs about €30.000

**2.** It is a mature renewable technology that produces the same amount of MWh/a as a photovoltaic system, but with half of taking area

**3.** It is a renewable technology that mostly promotes energy democracy, is fully decentralised, tackles energy poverty, is compared in cost with natural gas, is by 90% based on European technology and materials, and can save €100-200 billion from fossil fuel imports

**4.** It is a mature renewable technology, with the less political and funding interest, with no European strategy, or legislative package, with no interest by the commercial banks as well as the European Funding mechanisms

**5.** It is a renewable energy Greek industry that employs more than 3.500 employees in 22 Small and Medium Enterprises and

exports more than 60% of its production in USA, China, Japan, Gulf, etc

**Power** consumes 17% of the Total Final Energy Consumption, with 26% of this, coming from Renewable energy. On the other side, **Heating and Cooling**, is three times bigger, consuming 51% of the Total Final Energy Consumption, with only 10% coming from Renewable Energy, mostly biomass, and only 1.0% from Solar Thermal and Geothermal Heat.

**I dare saying that this is the elephant in the European energy room.**

The energy elephant of few discussion and interest in institutions, when deciding the European Green Deal and decarbonization of the European economies till 2050. So much discussion, directives, funding, interest, governmental decisions about electricity, and very few publicity, interest, legislation and funding, about the triple magnitude of Heating and Cooling.

The climate crisis already costs Europeans dearly. **In 2017, the cost of extreme weather-related damages cost €283 billion according to the European Environment Agency. That same year the EU spent €266 billion importing fossil fuels**.

In Europe, with circa 11 million of solar thermal systems in operation, we have 7 Mt of annual CO2 emissions savings, about €2 billion of sector turnover, and more than 20.000 jobs.

Worldwide, solar heat employs some **730.000 workers** and generates **a turnover of €21 billion**.

The sector is **mostly decentralized,** including over **120 million individual boilers, mostly old and inefficient, that need replacement.**

Let me say that I am proud that during my incumbency as Minister of Environment, Energy and Climate Change, eleven years ago, in 2011, my country included Heating and Cooling, in the form of Thermosiphon, at the very successful project of ***'Energy Savings at Home'***. The project had a total budget of €500m invested on 40.000 houses, with a yearly total energy saving of €1.700 for each household.

This project and its strategy, has been ranked as the second better European, just after the Spanish one. We have achieved this, with the help of the 22 Greek SMEs that produce thermosiphons of excellent quality, employ more than 3.500 employees and some of them are between the ten bigger all over the world, in exports to third countries. This project, during the 10 years of its application, included 71.000 thermosiphons installations with a total investment of €98.000.000.

From the total of final energy demand in industry, 74% is allocated to thermal energy,.

The **Solar Heat Industrial Processes** (SHIP) are well suited for generating low temperature heat up to 150°C for boiling, pasteurising, cleaning, drying, washing, steaming, cooking. Of the 300 Solar Heating Industrial Processes (SHIP) all over the world,10 are in Greece, 67 in Germany – Austria and 34 in Spain – Portugal - Italy.

There are 90 **District Heating Systems**, with the largest located in the Danish town of Silkeborg, with a capacity of 110MWth, in an area of 22 football fields of solar heat collectors.

**From the top European markets, those showing the largest growth were Denmark, with an increase of 174% and the Netherlands, with a 44% increase. Among Southern**

**European countries, the main market, Greece, has grown 10%.** The largest European market remains the German one.

**Solar thermal, providing energy at the lowest cost among all RES, can also help in reducing energy poverty.**

**European companies are leading in terms of innovation, and especially in large systems, such as district heating or solar heat for industrial processes.**

**Furthermore, it is an exporting sector, with annual net exports surpassing at times 1 billion Euros.**

The **Renewable Heating and Cooling Alliance,** calls for a **robust policy and funding framework to ensure that 50% of the total Heat and Cooling consumption by 2030 comes from solar heating, heat pumps, geothermal energy and renewable district heating systems.**

This should deliver **300.000 new skilled jobs**, **reduce emissions by 760 mtCO2e, develop local industrial supply-chains,** and importantly, low-cost, high-value heating and cooling solutions for customers as well as reducing dependency on imported fossil fuels.

Concluding, let me say that
**It's time to act, now**! Especially after the skyrocketing of natural gas prices, during the last months of energy crisis and of course the Russian invasion in Ukraine.

**Europe has a moral and economic duty to take action on the following five issues:**
**1. A Renewable Heating & Cooling Package**
**2. A renewable heating & cooling strategy to be included in all National Energy and Climate Plans (NECPs).**
**3. EU funds and financial instruments to deploy and further develop RES heating & cooling technologies**

**4. Planned replacement of old inefficient heating & cooling systems**
**5. Highly-skilled workforce for renewable heating installations**

**Thank you for your attention.**