

# **REFUND +**

## **National synthesis of WP2 and WP3**

### **Study of the Portuguese case**

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## I. Description of the Portuguese fiscal measure

The Portuguese fiscal measure towards RES-heat in the residential sector was launched <sup>1</sup>in 1991 with the objective to promote renewable energy use. This incentive had the following characteristics in 2007.

Measure	income tax reduction		
Focus	individual households (with main residence or secondary habitation), excluding persons with professional or entrepreneur incomes		
Renewable energy sources	direct and diffuse solar radiation, energy retained in forest or agricultural residues and wind energy		
Eligible appliances	Technology	Water heating	Surface heating
	<i>New equipment<sup>2</sup> for heat generation using renewable energy sources (since 1991):</i>		
	• individual solar thermal installations using flat or concentrated solar collectors	√	-
	• heat pumps	√	-
• heating systems using biomass (fireplace insert, stove, woodboiler, etc.) and respective fuel	√	√	
<i>New equipment for electricity generation using renewable energy sources (since 1991):</i>			
• solar photovoltaic panels and respective control and storage of energy system supplying electric energy for houses	-	-	
• wind power generation units below 5 kW of installed capacity and respective control and storage of energy system, supplying electrical energy for houses	-	-	
<i>New Equipments for the production of electric and thermal energy (cogeneration) by microturbines with a capacity up to 100 kW using natural gas (since 2002)</i>	√	√	
Technical requirements	Any specific technical requirement is mentioned regarding minimal efficiency of the equipment (for their eligibility) neither technical competences for installers.		
Fiscal deduction	30% of the expenses with the equipment and installation (reported by an invoice or equivalent document) can be deducted from annual taxation of families' income with a fixed ceiling (€761 in 2007). Between 2001 and 2007, this fiscal deduction couldn't be cumulated with deduction regarding house loans' payments. This is no more the case since 2008.		

The maximum deduction is established each year by the annual State Budgets. The calculation of the deduction was not always the same. There are two distinct periods.

During the first period, or between 1991 and 1997, the fiscal measure was a tax allowance where the cost of renewable energy equipment could be deducted directly from the total net income, before the calculation of the income tax was applied. A

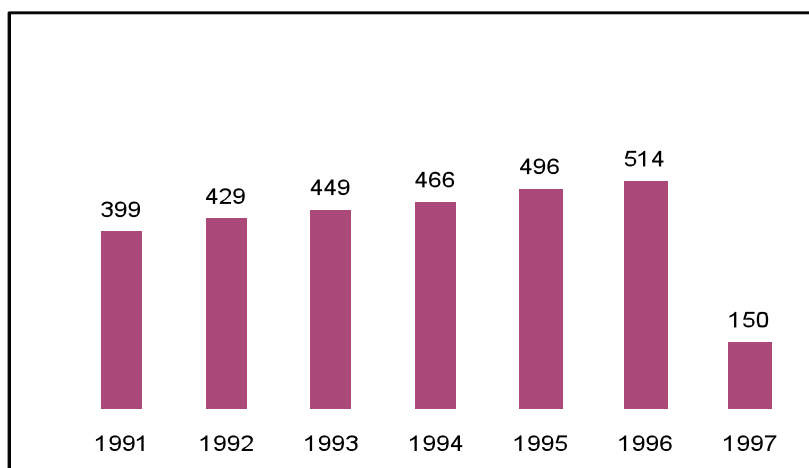
<sup>1</sup> Portaria n° 725/91 (29/07/1991).

<sup>2</sup> Including complementary equipment indispensable for their use.

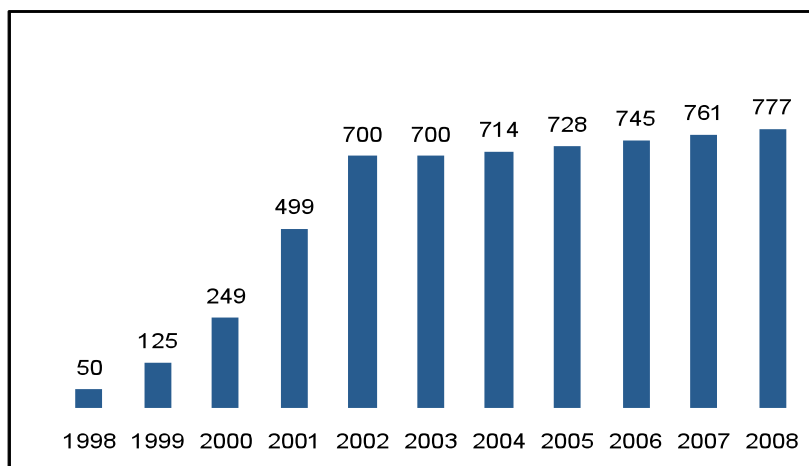
maximum value was defined each year regarding the fiscal potential deduction (see Figure 1). For the second period, since 1998, the fiscal measure was converted in a tax reduction with a maximum amount defined each year. The tax reduction is based on a percentage of the expenses with renewable end-use technologies (including equipment necessary to its functioning). The percentage of total acquisition cost changed from 20% (in 1998 and 1999), to 25% (in 2000) and to 30% (since 2001).

**Figure 1: Evolution of the ceiling deduction (in euros) regarding RES investment**

**Period 1: deduction applied to total net income**



**Period 2: deduction applied to calculated income tax**



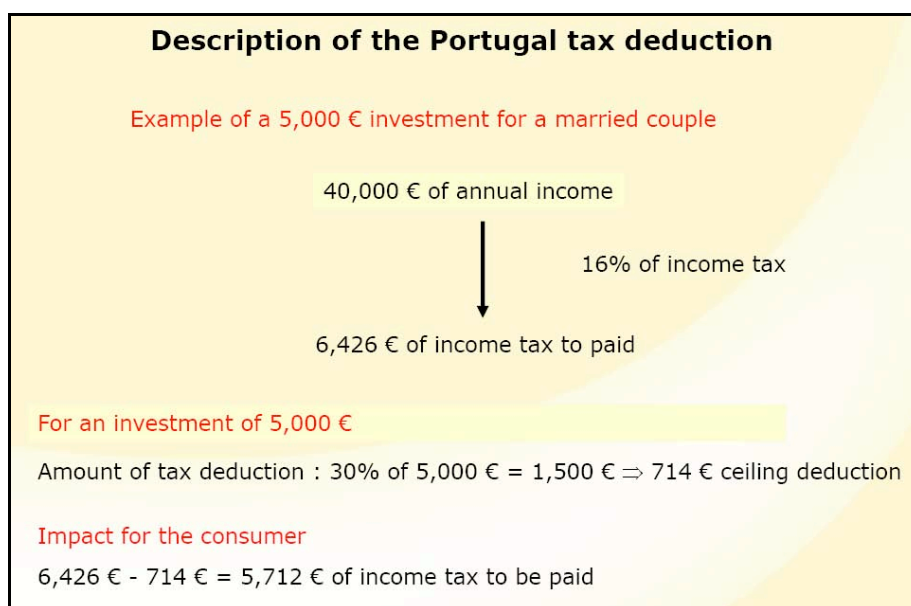
Note: In 2001 the value goes up to 598.6€ in case of complementary equipment.

Source: Annual State Budgets

**It is important to refer that since 2001 and until 2007 the RES-heat tax reduction could not be cumulated with deduction related to house loans' payments.** If a family had expenses in both categories only the highest deduction was considered. The impact of this limitation was substantial because many families have high house loan expenses.

The following picture summarises the maximum impact for the consumer of a defined investment in a RES-heat appliance for the year 2004.

**Figure 2: Maximum impact of the fiscal measure for a defined investment in 2004**



Finally, there is a particular situation at the Madeira Autonomous Region (Atlantic Islands), which has specific incentive for the use of solar thermal energy in the residential sector <sup>3</sup> which can be cumulated with the fiscal measure describe above. This incentive scheme started in 2002 and ended in 2007. The continuity of this incentive scheme is being analysed. Until 2007 the incentive was given to 486 families in the region.

The local legislation <sup>4</sup>is applied at the regional level and establishes an incentive scheme to the residential sector in the region, financing (subsidy) the acquisition of solar thermal systems for domestic use. This financial support is calculated by a specific formula with several parameters (like the collector type) with the limit of 1,000€ for a single household or 10,000€ for collective households. The VAT tax in that region is only 8%.

Despite the simplicity of the tax measure its design and information about it are perceived by the user as being of low quality. People don't understand how fiscal calculations are made, so they never know the impact of the measure on the investment. Furthermore, the interviewed consumers stated that there is no public/institutional dissemination of the measure neither of the RES-heat technologies. This lack of information reflects the lack of confidence in this measure, namely by professionals who considered that one feature of the scheme was turning it not effective for users also deducting house loan expenses.

<sup>3</sup> SIEST - Incentive scheme to solar thermal energy.

<sup>4</sup> Regional Decree-Law n° 29/2001/M.

## **II. Description of the main points which characterized the context surrounding the fiscal measure**

### **1. National policies in favour of RES in place at the time when the fiscal measure was implemented**

A national campaign regarding solar thermal equipments and installers was launched during the years 2002-2004 in the framework of the national programme "Água Quente Solar for Portugal". At the same time, the solar thermal sector was reorganised with new quality requirements for equipments and installers. No particular policy towards biomass heating devices and geothermal heat pumps for domestic application has been defined.

RES appliances benefit from a reduced VAT rate of 12% instead of the normal rate (20% since July 2008). However the normal VAT rate applies to biomass fuel while electricity and natural gas benefit from a reduced VAT rate (5%) and some petroleum products, like heating oil, are submitted to an intermediate rate (12%).

Since 2007, the new thermal code enforces the installation of solar thermal collectors in new residential buildings (some exceptions exist) which makes the fiscal measure not relevant anymore for this type of building.

### **2. Country main policy concerning the promotion of the RES targeted by the measure**

In 2001/2002 a set of initiatives (legislation, incentive schemes) has been introduced, aiming at stimulating the market (private investors), not only for RES electricity, but also for CHP, solar thermal use and energy efficiency in buildings.

Hence, the national programme "Água Quente Solar for Portugal" – AQSpP for solar thermal sector was launched in 2002, as an initiative of the Ministry of Economics and key actors in the national solar energy market to promote solar thermal systems, being the main driving force for the development of the solar market, aiming at selling solar energy systems for water heating as a quality product/technology economically viable and technically reliable.

Under the AQSpP initiative a set of integrated activities was planned and implemented in favour of developing and improving the solar thermal sector:

- increasing of the public awareness of solar water systems through advertising campaigns promoting the social-economical-environmental benefits of solar energy;
- providing a long warranty periods of six years for the equipment and introducing a certification process for the installers and by information campaigns;

- providing subsidies covering 20-40% of the investment cost of solar collectors through tax reduction for households or accelerating amortisation for the companies investing in solar equipment;
- reducing VAT to 12% (instead of 20% since July 2008);
- creating a specific “observatory” to monitor the programme.

For **biomass** and **geothermal** sectors the national energy policy doesn't mention a specific strategy, it's not clear the intention to implement direct measures in the household sector like in the solar thermal sector.

However, since 2007, a new thermal regulation for buildings (new and then retrofit ones) requires and, indirectly, promotes the integration of renewable energy technologies in the household sector for space and water heating, promoting the market for RES-heat appliances.

### **3. Country objectives concerning the RES targeted by the measure**

Any national objective has been defined for RES-heat appliances.

In October 2001, by launching the E4 Programme - Energy Efficiency and Endogenous Energies, the Portuguese Government has taken an important decision to foster the penetration of solar collectors in Portugal's energy market - the AQSpP Programme - and set the indicative target of 1 million m<sup>2</sup> of installed collectors in 2010. The implementation of the Programme was supported by comprehensive information dissemination activities, promotion of “new” fiscal and financing incentives, testing and certification of solar collectors, training and certification of installers, as well as the creation of a “Solar Thermal Observatory” and the promotion of a solar hot water selling service.

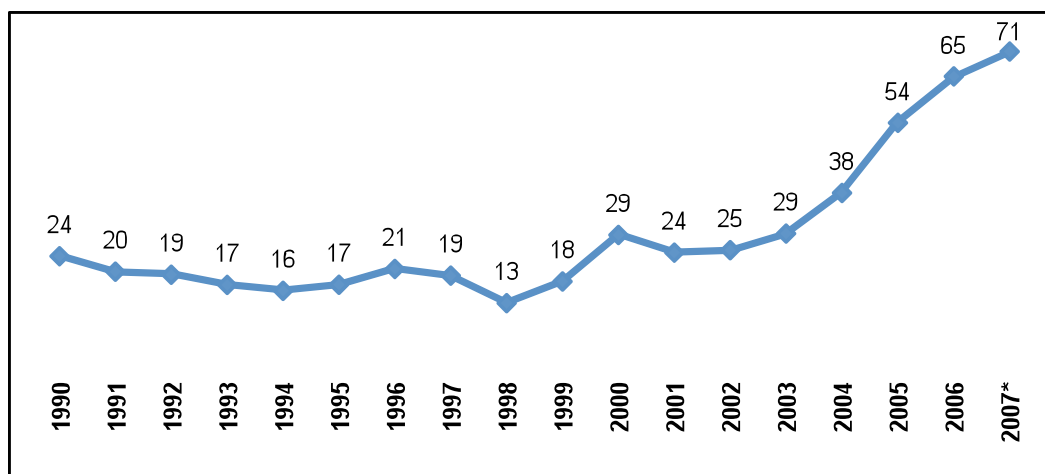
In the mean time, the national objective has been updated to a lower target given the low impact of this programme until now.

### **4. Country experience concerning fiscal measures towards domestic consumers**

The fiscal measure to support RES and namely RES-heat systems exists since 1991. Furthermore, VAT applied to RES appliances is 12% since 2002 instead of the normal VAT rate (20% since July 2008) for appliances.

### **5. The specific situation of the country when the measure was implemented**

Before 2002, RES in household were not really pushed and promoted by the government as fossil fuel prices were relatively stable and low (see figure hereafter). Since then a set of initiatives has been introduced (including income tax reduction) aiming at stimulating the RES market and namely the solar thermal market but its impact is not significant.



\* estimated value for 2007

Source: DGEG Directorate-General for Energy and Geology

**Figure 3: Evolution of the nominal price of Brent barrel since 1990 in €**

## 6. What was the growing trend of the targeted sectors before the implementation of the measure studied

Giving the fact that the measure was implemented in 1991, it is impossible to assess its effect comparing 2 periods, before and after. Several other factors have been influencing the market evolution since then. Furthermore the Biomass Heating Appliances (BHA) and Geothermal Heat Pumps (GHP) markets are characterized by a lack of data. Only the solar market is recently monitored by an official organisation, providing some data on market evolution.

Regarding the solar thermal market, it was decreasing when the fiscal measure was implemented (commercialisation of solar energy for hot water steadily declined from 22,000 m<sup>2</sup>/year in 1990 and to less than 5,000 m<sup>2</sup>/year in 2002). This trend observed in the 1990's was not affected by the change operated on the fiscal measure (from a tax allowance to a tax reduction) showing the inefficiency of the promotion scheme. The recent growth observed since 2003 is mostly due to a reorganisation of the solar sector (new quality requirements) and energy prices' increase since any change has been operated in the fiscal measure.

## 7. What was the industrial development level of the targeted sectors before the implementation of the measure studied

A "solar boom" occurred in Portugal in the late 70's - early 80's period, but the entrance on the market of a large number of new players was not followed by accompanying measures aiming to increase public awareness and to guarantee quality of products and services. Most of the systems installed in that period failed in short time and, as a consequence, the solar collectors bad image started growing.

The biomass heating market is a traditional market characterised by a lot of actors (equipment sellers, installers and biomass suppliers) and by a lack of organisation and quality requirements. Any specific development has been identified since the introduction of the measure.

The geothermal heat pump market should be a fast growing market but is still very incipient for the time being in Portugal.

### **III. Description of the main impacts or failures of the national fiscal measure implemented**

As the fiscal declaration is currently structured it is not possible to know the relative importance of the different renewable heating sectors. Fiscal declaration only requires information on cost to be deducted and doesn't discriminate between renewable supply systems. Since 2002 the total value deducted was around 5 million euros each year (see Figure 7 hereafter). Considering the fact that the fiscal deduction could not be cumulated with the house loan payments' deduction between 2001 and 2007 or its benefit is only marginal, the relative minor importance of this measure is evident (see Figure 5 and Figure 6 hereafter).

Since 2004, the fiscal deduction with renewable energy equipment was used by about 15,000 families which represents only 0.4% of total number of households with fiscal declaration. At the same time, more than one million of households (25% of total fiscal households) used house loans payments' deduction and therefore could not benefit or only marginally from fiscal deduction with investment regarding renewable energy equipment.

A common feeling often expressed by consumers (see WP3 report) is to be "deceived" by the State itself, which refers to a context of chronic mistrust in the political system and public finances. Consumers show their discontent with the lack of information that exists and which they have encountered. Such lack of information is primarily on two levels:

- Lack of knowledge about the measure.
- Lack of knowledge about RES heating.

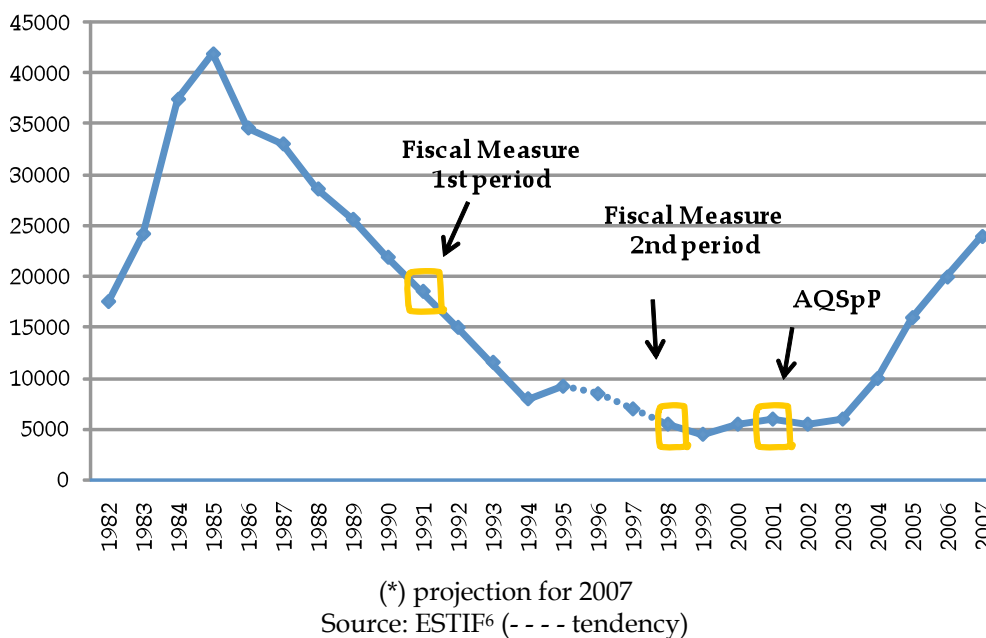
In fact, more than criticism of the measure itself, many consumers feel outraged by not making the slightest idea of the existence of the measure before the purchase. In some cases, it was only in the context of interview recruitment for this study that some had the first contact with the measure.

#### **1. Impacts on the market**

This impact may be different from sector to sector considering the specificities of the fiscal measures and the national context surrounding the measure implementation.

**For solar thermal:**

A “solar boom” occurred in Portugal in the late 70’s - early 80’s period due to the oil crisis. The growth in the m<sup>2</sup> installed peaked in 1985 at nearly 42,000m<sup>2</sup>/year, with more than 20 companies active in this renewable sector. But the entrance on the market of a large number of new players (manufacturers, importers and installers) was not followed by accompanying measures aiming to increase public awareness and to guarantee quality of products and services. Most of the systems installed in that period failed in short time and, as a consequence, the solar collectors’ bad image started growing. The falling of oil prices in the 80’s also helped to the drastic and rapid drop of the solar thermal market in Portugal. So since 1985, commercialisation of solar energy for hot water has steadily declined to 4,500m<sup>2</sup>/year in 1999<sup>5</sup>. The market only recovers consistently after 2003 with the conjunction of several effects: (i) a higher level of tax reduction, (ii) implementation of the AQSpP programme and (iii) a new increase in fossil energy prices (see figure hereafter).



**Figure 4: Evolution of the Portuguese total solar market (m<sup>2</sup> installed between 1982 and 2007\*)**

As shown in previous figure, the tax reduction measure had no impact on the market. The market growth estimated for solar thermal collectors during 2002-2004 was high but since the base year value is very small, the impact is not significant and far from the annual objective required to reach the national target for 2010.

The solar thermal market evolution has clearly shown that the impact of the tax measure has been low. Why? What are the main explaining factors?

<sup>5</sup> EREC, 2004, Review of Policy Initiatives within the EU – Portugal.

<sup>6</sup> ESTIF, Solar thermal markets in Europe (trends and market statistics). European Solar Thermal Industry Federation.

- Regarding the characteristics of the measure, the maximum financial incentive is quite small when compared with the required investment or with other countries where the measure is considered as effective. Moreover, the incentive available during the 2001-2007 period is not only for RES-heat systems but also for house loan payments. This further reduces the real incentive for RES-heat as many consumers are paying a house loan.
- Regarding information on tax measure, a national campaign was launched to promote solar energy in the framework of a new solar programme (AQSpP). This campaign included some additional information on the fiscal measure. However for consumers, the main information source is installers and many of them were not using the fiscal measure as a sale argument. So the lack of information on the measure and on RES-heat technologies is considered by the users an important barrier to RES-heat penetration.

*Hence, despite the national will to develop the solar thermal market, the impact of the tax reduction scheme is small. The main explaining factors are:*

- *Low financial incentive and, until 2007, aggregated with measure related with house loan payments, reducing significantly its effect.*
- *Low transparency and difficulty to assess its effect on tax reduction.*
- *Lack of promotional and information campaigns.*

#### **For other technologies:**

For BHA and GHP, any statistics are available to monitor the effect of the tax measure on these markets. However, as for solar thermal, the fiscal measure is described by market actors as having a low effect during the period of analysis (2004-2006). Other factors are explaining the past evolution, namely energy prices' increase.

## **2. Impacts on prices**

This indicator is only recently monitored by a public body for solar thermal collectors. So there is no information or studies on this issue. However, according to some interviewed installers the fiscal measure has no effect on prices of solar thermal equipment, biomass heating systems as well as heat pump appliances and there are no significant changes on the average selling prices during the last years.

According to collected data from interviewed installers (see WP2 report), some estimates have been done regarding the prices of RES-heat appliances. The following table gives the evolution of estimated nominal prices for defined equipment.

**Table 1: Estimated investment cost for RES-heat appliances\***

	2003	2004	2005	2006
Solar water heater (4m <sup>2</sup> )	2,533	2,584	2,635	2,688
Closed fireplace insert (10kW)	1,161	1,184	1,208	1,232
Wood stoves (10kW)	2,111	2,153	2,196	2,240
Wood boilers (20kW)	4,749	4,844	4,941	5,040
GHP (water heating)	n.a.	n.a.	n.a.	n.a.
GHP (water and space heating)	13,193	13,456	13,725	14,000

Source: CEEETA's estimates based on installers' interviews.

\* including material and installation costs and VAT

### 3. Impacts on industrial sectors

As for the impact on RES-heat markets the impact on national RES industries is different from sector to sector according to the level of market development and the industrial background. However, as it has been stated, the fiscal measure has not been a trigger regarding RES-heat technologies' development, so evolutions are mainly related with other factors than the implementation or modifications of the tax measure.

#### For solar thermal:

According to EREC<sup>7</sup> in 1990 the number of companies active in the field was 5 manufacturers and about 50 companies listed as installers, engineering companies or importers, perhaps with only 10 of them dealing with solar energy.

The market is rapidly changing with several companies appearing in the market, as producers or importers, and people interested in both formation courses given by INETI (National Institute of Engineering, Technology and Innovation): installers and designers of solar thermal systems. The next table shows the distribution by category of the market agents in 2005.

**Table 2: Solar Thermal market agents in Portugal (2005)**

Manufacturers	8
Importers	15
Installers	88
Designers	40

Source: IEA, Portugal- National Program Report 2005

<sup>7</sup> EREC, 2004. Review of Policy Initiatives within the EU – Portugal.

Along the years the dynamic of the market had repercussions in the number of manufacturers, installers and importers. It is important to refer that the process of certification made some difference in the market evolution but the fiscal measure doesn't seem to have relevant influence on this dynamic.

New requirements regarding the quality of equipments and the qualification of installers (certification process) has provided a context of confidence for RES-heat systems and namely solar thermal collectors. Actually (end of 2007) there are 49 certified solar thermal collectors in Portugal (by Certif, the certification association).

Solar companies and manufacturers are organised in one association APISOLAR established since 1998. Actually they are 36 but many other companies are present in solar thermal market.

#### **For other technologies:**

In the case of **GHP** and **BHA** there is no official available information about the market. Only direct contacts with manufacturers, distributors and installers gave us some qualitative information about the impact of the measure (see WP2 and WP3 reports).

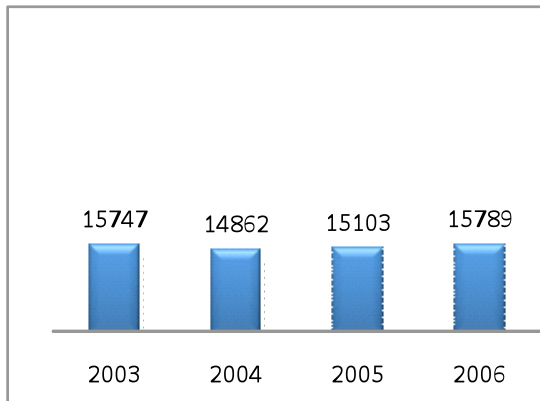
#### **4. Cost of the measure**

As data on this indicator is not available per RES-heat sector, the analysis was done on the basis of the total budget allocation for this measure.

It can be stated that the fiscal deduction related with investments in renewable energy equipment was used by few households, around 15,000 each year (see Figure 5), which represents only 0.4% of total number of households with fiscal declaration. At the same time, more than one million of households (25% of total fiscal households) used house loans payments' deduction and therefore could not benefit or only marginally, from fiscal deduction with investment regarding renewable energy equipment (see Figure 6).

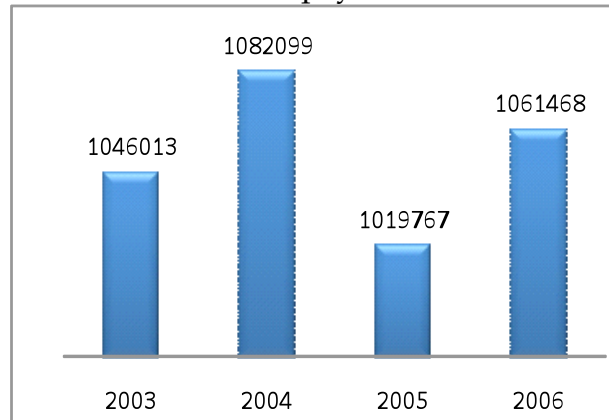
Considering the fact that the fiscal deduction could not be cumulated with the house loans payments' deduction between 2001 and 2007 or its benefit is only marginal, the relative minor importance of this measure is evident. Households who used this fiscal deduction represent only 1.5% of both types of households (who benefit from fiscal deductions with renewable equipment and/or house loan payments).

Figure 5: Evolution of households who benefit from the renewable deduction



Source: Ministry of Finance and Public Administration

Figure 6: Evolution of households who benefit from the house loan payments' (1) deduction

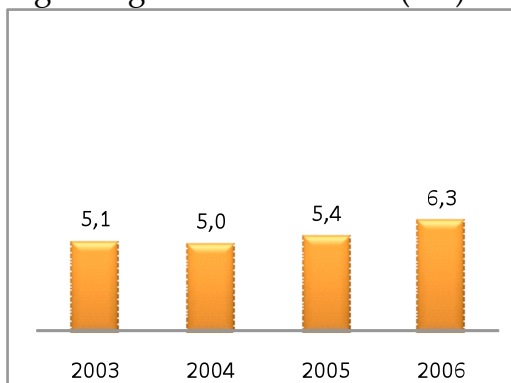


(1) Interests and amortizations

As the personal annual income declaration is currently structured it is not possible to know the relative importance of the different renewable heating sectors under study. This fiscal declaration only requires information on the cost to be deducted and doesn't discriminate between renewable supply systems. Between 2003 and 2006 the total annual value deducted by households with renewable energy equipment investment was around 5 million euros in each year, with exception for 2006 (see Figure 7).

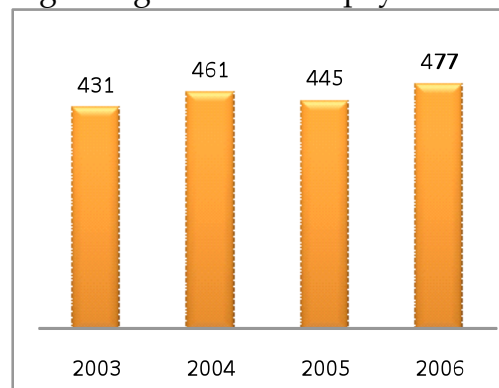
The RES tax reduction is almost irrelevant in the global pool of fiscal measures (includes: health expenses, house loan payments, education expenses, insurances premiums, etc.). The same happens when the tax measure cost for RES investments is compared with the total cost for a pool of fiscal deduction where RES investments are included (deduction for RES investments and house loan expenses).

Figure 7: Evolution of the deduction regarding RES investments (M€)



Source: Ministry of Finance and Public Administration

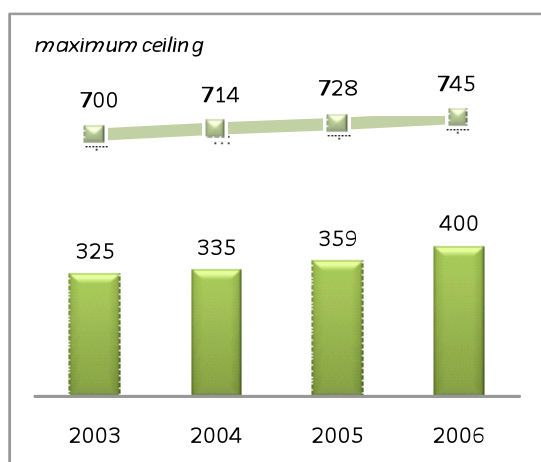
Figure 8: Evolution of the deduction regarding house loans' payments (1) (M€)



(1) Interests and Amortizations

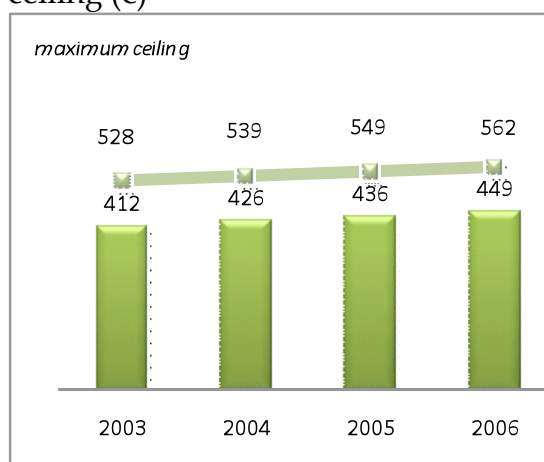
In average the value deducted per household with renewable energy equipment investment has been growing since 2003 (see next figure). Despite this increase, the tax reduction is not used at its maximum ceiling. For example in 2006 the maximum ceiling was 745€ and the average deduction was only about 400€.

Figure 9: Average renewable deduction per household and maximum ceiling (€)



Source: Ministry of Finance and Public Administration

Figure 10: Average house loan payments' (1) deduction per household and maximum ceiling (€)



(1) Interests and Amortizations

The possible reasons for not achieving the maximum ceiling are that the number of new systems is low and that deductions claimed are mainly related with complementary equipment (partial substitution of equipment, small investments in fireplace inserts, stoves, etc.) and in other cases there are households that don't have enough income tax to pay so they can't benefit from the measure or only a small part.

#### IV. Other lessons learned from qualitative study (WP3)

- *The measure is not a selling argument:*

The measure is not an argument that the **installers** take as decisive to the consumer's final decision, taking into account the outlines of values involved.

From the consumers' point of view, the measure has the potential to be used as a selling argument, given that a deduction on IRS is always welcome. But, in general, consumers tend to look to the measure with complacency.

*"It's a nice thing." (BHA)*

It should be noted that none of interviewed consumers has taken the measure as a factor in its decision making even when considering the measure as a positive argument. Consumers stated that they would have taken the same decision even if it did not exist any such measure. In fact, many only knew about the measure at the end or even after the purchase process.

*"I must say that if I have not had any fiscal benefit, I would have chosen exactly the same investment." (GHP)*

- ***In general, knowledge about the measure is vague and reduced to the fact that RES-heat investment costs are eligible for fiscal deduction:***

Many only knew about the measure at the end or even after the purchase process. Even among those who know of its existence, they do not know in detail all the characteristics of the measure. Most consumers only know that they can deduct their investment on the income tax to pay because the installer gave them such information. Some (few) have a vague notion that there is a ceiling and some incompatibilities with the deduction for house loans' payment.

*"When I knew about the measure I thought to myself – it is another deduction on IRS. However, I don't know neither how much I can deduct nor what percentage they will give on this."* (BHA)

- ***The majority of people are not very familiar with the fiscal deductions that they could use:***

It is worth mentioning that Portuguese national context is characterized by a widespread low level of financial literacy, which among other financial issues includes the issue of annual income tax. They only know they can deduct medical expenses, children's educational expenses and some other deductions.

*"I have never filled up a tax form in my life. I have always someone who does this for me. I don't know how to fill up the IRS form. The only thing I know is that I can deduct medical and health related expenses."* (GHP)

- ***The investment in RES-heat appliances is considered expensive:***

The investment in RES-heat appliances is relatively expensive (depending on the technology, it is more or less expensive) and requires savings, despite they recognize that the investment is quickly offset by what is saved on fuel and electricity costs.

*"For now, solar panels cost are too expensive, above what we can afford. But it doesn't mean that it would not pay the initial investment over time."* (BHA)

*"He told me that it was a bit more expensive but in the medium term I recover the money; also that I was better served because is less polluting, less spending and could use to the woodfuel from the mountain."* (BHA)

## **V. The main conclusions and recommendations to enhance the measure**

In Portugal RES-heat systems are not yet publicly perceived as a standard option. The industry is still too small and fragmented to play a strong role when compared with electricity and gas utilities. Direct marketing or use of mass media have so far been possible only when public authorities have directly supported specific initiatives.

The existing income tax reduction is not considered by the actors in the market as an effective instrument to stimulate the selling of renewable energy appliances in the household sector. Despite its increase, the amount of the tax reduction is still considered too low when compared to the average investment cost (2,500 to 3,500€). Most potential consumers consider fiscal incentive not attractive enough. Furthermore, since most Portuguese families use house loan deduction in their income tax declaration, the probability to benefit from an investment in a renewable equipment is low as shown by the low number of families using this fiscal measure each year (about 15,000 during 2003-2005 period).

High investment cost and low real incentive impose a barrier to the RES-heat market development. The limited growth of renewable equipment in recent years might have been also the consequence of other factors like a weak economic growth in Portugal and relatively low energy prices during 2000-2004.

It is also important to underline the recommendations made by some actors in the market (most of them installers of imported equipment). According to them it is necessary to improve some aspects of the fiscal measure (e.g. more public information and independency from other fiscal deductions), to promote the targeted RES, to follow the efforts implemented to enhance the efficiency of the RES equipment sold on the market and to contribute to consumer's knowledge regarding the RES sectors (through installers or sellers).

**Main conclusions from the Portuguese case:**

- The existing income tax reduction is not considered by the actors in the market as an effective instrument to promote the development of RES-heat appliances in the household sector. The amount of the tax reduction is considered too low. The fiscal measure is a “nice thing”, but even when known a priori, is never a decision factor for the purchase decision.
- The development of RES-heat sectors is driven by fossil energy price increase. The high price of fossil energy is the main motivation to seek alternative forms of heating the house, whatever the life style is.
- The main consumers’ critic is the lack of information about the measure and about RES heat systems. The seller/installer is the main consumer’s source of information about the measure and not a public body. Technologies using RES in the domestic sector are not sufficiently known by the public and/or are globally very expensive in comparison to appliances using fossil fuels or electricity.
- The measure is considered not well disseminated. In general, knowledge about the measure is vague and reduced to the fact that RES-heat investment costs are eligible for fiscal deduction but people don’t understand how fiscal calculations are made, so they never know the impact of the measure on the investment.
- Two of the three RES sectors (solar thermal and geothermal heat pumps) are not important in terms of employment and they are dominated by imported technologies, therefore the government has low interest in supporting the development of these technologies.
- The way this fiscal measure was structured between 2001 and 2007 seems to show that the government was giving more importance to support the building sector (with high national effects in terms of employment and economic growth) than RES penetration in the domestic market (deduction for investments in renewable equipments could not be cumulated with house loans’ payments).
- The investment in RES-heat appliances is relatively expensive (depending on the technology, it is more or less expensive) and requires savings, despite they recognize that the investment is quickly offset by what is saved on fuel and electricity costs.

**Main recommendations:**

- Characteristics of the fiscal measure:
  - it should be flexible to be adapted to the national context on energy prices, appliances' cost, market evolution, sectoral development and legal frame. For example the maximum support amount could vary according to some indicators characterising the national context.
  - it should be structured in order to be effective for all potential users (tax credit instead of tax allowance or tax reduction). The tax allowance and tax reduction schemes don't allow consumers with low or any tax income to use this measure. On the contrary, the tax credit scheme works as a subsidy for any RES-heat investor.
  - it should be kept simple but isolated from other tax measures and formulated in order to be possible to keep track of chosen technology for monitoring purposes.
  - a simulation tool should be available to test its impact for the consumer. This could be available through local energy agencies and/or downloadable at the Ministry of Finance's site and use by installers and/or consumers.
  - it should be defined in order to stimulate efficiency improvement, introducing minimum efficiency criteria. These criteria should be analysed according to market evolution and technological development and if required revised each year.
  - it should be defined in order to incentive minimum standard of quality namely through quality requirement for installers and appliances. Hence support to RES-heat appliances should only be given to installers and equipment fulfilling this requirement.
- Regarding its first implementation, the measure should be previously prepared with sectoral actors in order to guaranty the quality of RES-heat appliances (quality label) and quality of installations (installers' certification).
- The implementation of the measure should be followed by a dissemination campaign to provide information about the measure and eventually about the RES-heat systems. National and local energy agencies should be involved in this activity.

It is important for people that the State and local authorities set the example of energy good practice in public buildings and in standards of the building sector.

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