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Synthesis of the WP2 and WP3

Study of the Italian case



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National synthesis of WP2 and WP3

1 Structure of fiscal incentivisation schemes for solar thermal, heat pumps and biomass heating systems

Italian fiscal measures, as building renovation market driver, including energy retrofitting measures, have been implemented since 1998 through national Financial Acts, being reiterated every following year. Tax deduction schemes to promote specifically solar thermal have been recently introduced with specific rules.

1.1 *The national Financial Act 1998*

According to the national Financial Act 1998 nr. 449 taxpayers who incurred expenses for building restructuring with heat pumps and/or solar thermal installation in the period 1998 - 2000 can, in their personal income tax return, make full use of the 41% personal income tax deduction (up to a maximum expense of 77,468.53 euros) by constant instalments in 5 or 10 years. There is also a reduction of VAT from 20% to 10% for all invoiced expenditure related to heat pumps and solar thermal systems, including design, materials and labour.

1.2 *The national Financial Act 2000*

The national Financial Act 2000 nr. 488 recover most parts of previous Financial act 1998 with a few changes: taxpayers who incurred expenses for restructuring, in 2000 and 2001, can include invoiced expenditure, eligible for the 36% personal tax deduction (rather than 41%) solar thermal, heat pumps and biomass heaters, under the condition of at least 70% thermal efficiency (up to a 77,468.53 euros), by constant instalments of 5 or 10 years; it is maintained the reduction of VAT from 20% to 10% for all invoiced expenditure related to heat pumps, solar thermal and biomass boiler. Beneficiaries of fiscal measure can be the building owner, the renter or the holder of the right to use. Taxpayers have to claim for tax deduction in their statement of income and each one of the constant instalments cannot exceed the due yearly income tax, as it is not allowed to be in tax credit.

1.3 *National Financial Act 2007 (N.F.A. 2007)*

The 2007 edition of the Financial Act introduces a specific tax relief, allowed to all types of taxpayers, for energy saving interventions in existing buildings, with a higher fiscal benefit (up to 55%), and confirms the VAT reduction at 10% on eligible expenditures, rather than 20%.

One of the four types of allowed energy measures is the installation of solar thermal systems. Other investments on RES generation (**heat pumps and biomass boilers**) are not clearly mentioned between the four type of eligible technologies. In fact they can be included as eligible expenditure for tax deduction, only if a professional make a declaration in which he demonstrate that the overall primary energy consumption

for building or flat heating, in consequence of the particular plant installation, becomes less than 20% of the minimum requirement foreseen by the annex C of decree n.192/2005.

The application for 55% tax deduction must include both the energy building certification, made by professional experts, and the original documentation, reporting material and appliance energy performances, complying EU quality standards.

The N.F.A. 2007 introduces furthermore the obligation of making building certificate to report the new overall building performances owing to the application of the selected eligible saving measures listed in N.F.A. 2007 and RES heating appliances. Building certificate has to be carried out by a qualified professional and has to include building energy audit, energy class certificate and advices for further measures to upgrade energy building performances.

The solar thermal interventions for which a 55% tax deduction can be obtained are submitted to the following conditions:

- The installation of the solar thermal system may include materials, labour, piping and building work, also in case of integration with heating systems.
- All professional services necessary for the realisation of the intervention(s), including the “energy certificate” are also included.
- The maximum amount deductible for the energy refurbishment of building (with a primary energy requirement for winter heating value <20% of the values foreseen by L.D.192/05) is 100.000 €;
- The maximum amount deductible for building insulation is 60.000 €;
- The maximum amount deductible for Solar Thermal plants for domestic hot water production is 30.000 €;
- the tax relief shall be deducted in a period of three years, by constant instalments.

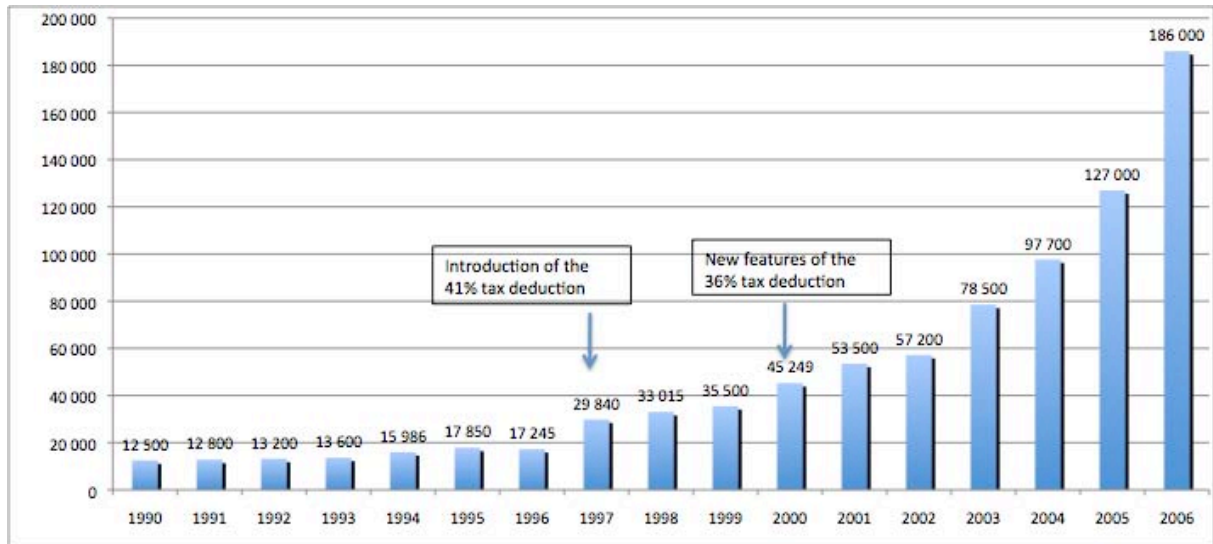
<p>Note : this latest NFA was implemented in 2007 so the effect of this new measure features are not studied in this report which mainly focused on the period 1998 - 2006.</p>
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2 Evaluation of fiscal measures impacts on main data market

2.1 Impact of tax deduction on Solar Thermal installations

In the last 10 years, the Italian solar thermal market has had one of the highest growth rates in Europe, but starting from a very low level. This can be outlined by the following trend:

Trend of Solar collectors installed in Italy (in m²) form 1990 to 2006 ¹



Solar energy in Italy was developed after the oil crisis in 1973, when under the pressure of energy shortage an increasing interest was seen and programmes were multiplied in favour of solar energy.

After a vertical start in the late seventies and early eighties, the market collapsed and went through a long period of stagnation at a very low level, until the mid-nineties. This long stagnation was due mainly to two factors:

- Inexperience of all the actors involved, both manufacturers with inefficient products and installers with unreliable systems. In the seventies and eighties, the relatively high number of systems which did not work properly had a negative impact on the trust of users and public authorities in the technology. It took a long time to re-build this trust.
- Interruption of financial incentives: from 1987 until the late nineties, there were no financial incentives, except for the small provinces of Trent and Bozen/Bolzano.

¹ Source: ASSOLTERM. First market estimation for 2007.

The new period of slow development since the mid-nineties has been based on the success of solar thermal in other European countries, showing the higher technological maturity of the sector and allowing for know-how transfer. In Italy the new recovery of the solar thermal market started since 1997 thanks to the contribution of several factors:

- The introduction of the 41% tax reduction measure;
- The development of the regional subsidies;
- the reduction of the material prices.

From 1997 to 2001 the yearly average market growth was around 21% with respect to less than 6 % between 1990 and 1996.

Real figures about the number and amount of tax reduction are still uncertain but it has been possible to gather some assessment about solar thermal sector through interview with ENEA (National Energy, Environment and Technological Innovation Institute) experts.

A rough ENEA² assessment, not already official, made by solar thermal experts, evaluates that the tax reduction requests for solar thermal reached about 11% of the total solar thermal market in 2006. That reveals a still moderate relative interest in using tax deduction as investment benefit, but a significant absolute value: about 14 MWth, or 20 000 m²/y (20 M€/y investment).

The introduction of the new National Financial Act 2000 gave an additional market support. Between 2000 and 2006 the market followed an average growth rate of 26% leading the Italian solar market to the fifth European rank with 186 000 m².

However, the impact of the Italian tax reduction measure was constrained by two main factors : bureaucratic weight for professional and end consumers when they are using the measure and the lack of quality label and standard on the market.

¹ Interview with Roberto Moneta, Ministry of the Economic Development, general director of the Energy Department, reporting figures and estimations made by Giampaolo Valentini of "ENEA" (The national Body for New Technologies, Energy and Environment).

2.2 *The components of the solar system cost and the role of tax deduction (in year 2006)*

Breakdown of solar systems costs:

	Solar System Costs for Typical Sized Systems	
	Individual	Project (large scale)
Total costs (excl. VAT)	1.100 €/m ²	1.000 €/m ²
VAT (10%)	110 €/m ²	100 €/m ²
Total costs (Incl. VAT)	1.210 €/m ²	1.100 €/m ²
Typical size of system	4 m ²	40m ²

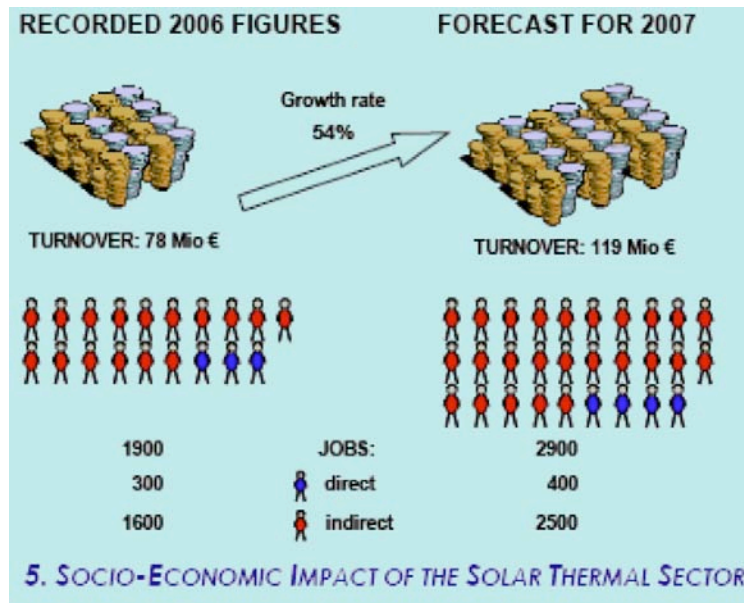
This refers to forced circulation systems. Installation of solar collector systems allows a considerable saving on energy costs. Considering a typical family, using a solar collector for domestic hot water the average warm water consumption for a 4-person family is about 3.600 kWh/year. With a 4m² solar collector, the consumption can be reduced by 75%, allowing the family to recuperate the investment for the solar system in four years, under best conditions.

The percentage cost breakdown of an average system differentiated according to system types is:

	Natural Circulation	Forced Circulation
Manufacturing (materials and manpower)	50 %	40 %
Marketing/ distribution	25 %	25 %
Installation	20 %	30 %
R & D	5 %	5 %
Total installation costs (Euro)	2.800 €	4.400 €

Economic and occupational impact

In 2006 the Italian solar thermal industry reached an overall turnover of 78 million Euros, offering almost 1,900 full time (direct + indirect) jobs. Thanks to the predicted growth (54%), the forecasts for 2007 are a turnover of about 120 millions Euros and 3,000 jobs, assuming – under the current structural conditions of this industrial sector – the creation of 1 full time job per 70 kWth (100 m²) installed. Another remarkable outcome of the study has been the individuation of a number of thermohydraulic manufacturers which showed quite a large turnover in solar business by selling components such as pumps, controllers, pipes, etc.



In the beginning of the 00's, employment figure was less than 400.

Tax reduction contributes toward the development of a national solar thermal industry

The results of this first national statistical survey demonstrate that – parallel to the boom which is being experienced in terms of market and media coverage by photovoltaics – the solar thermal sector has taken off in Italy too. From the industrial side, the sector is evidently in good condition, showing an economic and employment dimension which is gaining momentum. Many Italian manufacturers have, with much effort, made it through the "dark years" of ST in Italy since the mid Eighties, with the result being that today a good number of specialised enterprises are settled in the country.

Since the 1998 the new favourable policy framework and the spontaneous market-driven growth could not help but stimulate new investment initiatives (which may be surprisingly large) aimed at strengthening the national production capacity. Such initiatives might come from both sides of the ST specialist manufacturers and of the major players of the Italian heating industry, in response to the active presence of the respective foreign competitors. In this dynamic context, the crucial role of steering and support is to be kept by the central and regional governments. They must first of all ensure that sustained market growth is maintained over time, primarily by avoiding the stop-and-go effects induced by suboptimal application of policy tools. Secondly, they must guarantee that the growth is accompanied by the necessary high quality standards of products and installations.

Last but not least, consideration must be given to the opportunities that can be seized on the supply-side. Italy's current high degree of dependency on imported technologies (a condition which is common in almost all sectors of renewable energies) presents a striking opportunity to make the development of solar thermal in Italy not only a goal of *energy & environmental policy*, but also a lever of *strategic industrial policy* for the country.

We are talking of an industrial sector characterised by a considerable rate of growth in the demand for mature products and by significant room for development of more innovation-based technologies and applications, such as large-scale plants for industrial process heat and for combined DHW-space heating in the civil sector, up to the strategic frontier of solar cooling³.

The main advantage offered by tax deduction towards the ST sector, and therefore its industry, is the guarantee of continuity in time, even if it has to overcome the step of yearly approval in the National Financial Law. As a matter of fact this kind of incentive has never been suspended since 1998. Contributions on the contrary have always had limited duration, restricted amount and uncertain assignments, due to the fact that are proposed through announcement of competition and have to be foreseen in the yearly public budget allocation.

2.3 Marketing strategy

The producers and installers role

The weakness of the distribution structure is at the same time the consequence and main cause of the moderate development of the Italian market so far. Most Italian producers and importers are still too small to afford a widespread marketing structure. A well structured network of wholesalers at national level does not yet exist. Most sales are done by the installers, and in a few cases by wholesalers. Marketing activities are therefore mainly done by single producers and importers, facing a public often still sceptical, even if showing an increasing interest in solar thermal products.

Marketing is mainly targeted at the final consumer rather than at professional actors in the building and construction industry, such as engineers and architects. This choice is in most cases unavoidable, as the results of marketing towards the industry may be higher, but require long-term investments, which can not yet be sustained by the dimension of the Italian market. However, this is a major limitation of solar thermal marketing in Italy. The three key arguments for marketing solar thermal systems in Italy are currently: environment, high comfort, and long-term reduction of energy costs. Guaranteed solar results contracts, despite their potential, are not yet often used as an incentive for collective installation.

Promotional activity is mainly conducted through fairs and expositions, and to a small degree through media and specialized magazines.

In the after-sales phase, producers and importers usually offer the following guarantees: 2-10 years for collectors, 5 years for boilers and 2 years for other components. Typically the sellers propose an annual maintenance cycle⁴.

³ Source: Solar Thermal takes off in Italy – 1st Statistical Survey & Market Study year 2006

⁴ Information drawn by the interview with Andrea Seminara, director of Marketing and Communication of the company “AzzeroCO2” (promotional organisation in the field of solar technologies, REs and energy efficiency).

The installers role

The installers role is becoming the more and more important for a number of accessory services, offered to consumers, related to getting the papers for the 36% or 55% fiscal deduction request (in the 2007 National Fiscal Act):

- data transmission to the national central fiscal authority;
- compilation of the request of authorisation to the Municipality;
- payments by bank transfer only with indication of the VAT number of the beneficiary;
- release of regular invoice for all expenses.

2.4 Italian Heat Pump Market

Geothermal source

The temperature of the resource and therefore the type of deposit is the determinant element for applications using geothermal heat.

Nearer the surface, it's possible to exploit the geothermal resources for heating and air conditioning of buildings using geothermal heat pumps. We are then speaking of very low enthalpy deposits. The geothermal heat pumps can either directly heat a building or supply a heating network. The heat can be taken from the water tables (at less than 100 metres depth with temperatures that can go up to 30°C) or directly in the ground via vertical probes that measure from a few dozen to several hundred metres in length. The heat pumps using underground heat at approximately one metre depth via horizontal sensors draw more of their energy from the sun that heats the ground than from the earth. At this depth, the effect of the geothermal gradient, which is from 2°C to 3°C every 100 metres, is very low but interesting.

Energy applications for household heat production

Heat production can be obtained from geothermal energy in two distinct manners. The first consists in directly exploiting the substratum aquifers, whose temperatures are included between 30°C and 150°C (so-called low and medium energy applications). The second way of producing heat is through the use of geothermal heat pumps that are of so-called very low energy applications.

The situation of very low energy geothermal energy (the geothermal heat pump market) is very favourable, in fact is knowing a strong acceleration in installation rates.

This acceleration in installation rates, is explained at the same time by the strong increase in the price of fossil fuels and electricity, as well as by an increase in aids to investment⁵.

Even though their number hasn't stopping increasing, counting geothermal heat pumps continues to be a very difficult task today.

The diversity of the different types of geothermal heat pumps also contributes to the difficulty of the exercise. Geothermal heat pumps can be of different sizes (from a

⁵ Source: EurObserv'Er 2006 -State of Renewables Energies in Europe, 6th report

few kWth to several hundred kWth) depending on whether they heat (or cool) an individual home, a building, or supply a district heating network. Another difficulty comes from the fact that the designation of the geothermal heat pumps is not the same in all of the countries of the European Union. Numerous countries distinguish heat pumps as a function of the source where the energy is taken, that is to say the ground (horizontal and vertical sensors), water (water table, surface water) or air. These last types are not counted in the overall group of geothermal heat pumps.

Quantity and installed capacity of geothermal heat pumps* in Italy in 2005 and 2006 ⁶

	2005		2006	
	Number	Capacity (in MWth)	Number	Capacity (in MWth)
Italy	6 000	120,0	7 500	150,0

Geothermal heat pumps, even if they have not specific incentives, can benefit today from 55% tax deduction when the installation is part of a global energy saving intervention, included therefore in the frame of the energy performance of buildings national scheme proposed by the National Financial Act 2007.

Main conclusion from the quantitative analysis

- The introduction of the 36% tax relief through the NFA 1998 and even more the NFA Act 2000, gave an evident additional market support to Solar Thermal sector and helped it to keep going on a regular growth path.
- The real advantage offered by tax reduction towards the ST sector, is the guarantee of continuity in time, even if it has to overcome the step of yearly approval in the NFA.
- National grants on the contrary have always had limited and spot effects.
- The tax relief instrument is sometimes rejected because contrasts the widespread tendency of avoiding the invoice emission for installation expenditures.
- The lack of quality standard or label and bureaucratic weight of procedures blocked the market to reach higher level.

⁶ Source: Geothermal energy barometer - September 2007

3. Perception of the measure from the consumers and the professionals

3.1. Role of the fiscal measure, relations with sellers

While in the opinion of Environmental Consciousness and Techno DIY the fiscal measure constitutes the driver argument in installers/sellers sales pitch, like through advertising papers made for this purpose, a very minority of cautious people has been informed and stir about it.

3.2. Function of the credit tax

Triggering role

Most of Environmental Consciousness consumers were already convinced to make a green investment toward their family and partner, considering the attraction for a clean application or the chance to save money on energy bills. The appearance of the NFA 2007, in many factors improved in respect to the previous one, has played a triggering role in activating the investment and has allowed to make that wish come true.

An unexpected good surprise

The investment of the majority of cautious people, in pellets boilers, is triggered mostly by the increase of fossil fuels prices, in particular of LPG cylinders. A pellets boiler is preferred to other RE heating technologies because of its low of price, less than half of solar thermal systems, and also because pellets are even cheaper than wood, but also because of the familiarity with the use of wood and pellets.

Most of cautious people, on the basis of price comparison, comes to buy pellets boilers regardless of all benefits given by fiscal incentivitation. In case of old and small dwellings without heating system, a pellets boiler is the cheapest and easiest solution rather than lay down pipes along walls as in conventional systems.

A reassurance on the project financial feasibility / the possibility to change the nature of the investment thanks to some more money available

The possibility to change the nature of the investment thanks to some more money available has been accepted differently in relation to the technology bought, hence viewing the whole sample we had the following results: 3 out of 6 people who installed solar systems and 1 out of 4 people that bought pellets boilers profited from the fiscal measure by augmenting their investment choosing a top quality product or enlarging RE capacity. In other terms this chance has been grabbed by 50% solar thermal clients and by 25% of pellets boilers.

3.3. The main Obstacle to the measure

- Abolish the severe restrictions (different laws, at local or provincial level, sometimes contradict each other) concerning the architectural landscape regulations in the city centre area: the near impossibility to use the roof tops for solar thermal energy sources in these protected areas slow down a big part of the Res installation process in ancient city centres;

- The same (as above) goes for buildings that fall under the category of cultural heritage, that by all means, should be and remain protected, but the procedure and regulations should be 'updated' in accordance to the latest progress and possibilities in the field of Res technologies;
- Introduction of a tax reduction also for new constructions that go beyond the already established regulations on energy saving and efficiency;
- The municipalities should start with obligatory energy management courses for condominium managers - include a package of 'simple' Res technologies in the courses to become condominium manager;
- Door to door distribution of energy saving / efficiency solutions explaining how to obtain tax reduction and how to convince the condominium manager for its application.
- GHP: a trigger incentive is absolutely needed (just as occurs in the autonomous Provinces of Bozen and Trento, where an additional 30% reduction and a 25% grant to the investment are provided by the local Provinces).

4. Conclusion on the part

The fiscal measure has given great impulse to RE heating market permitting many investments otherwise undone. Notwithstanding different approaches to the investment, and different time spent in the purchasing process, everybody has find its own way to finally succeed in defining all economical and fiscal aspects. Hence, even after all, the fiscal measure has been favourably accepted to all final consumers willing to invest in RE heating technologies.

Additional Regional help is considered unnecessary for solar thermal collectors, pellets boilers and geothermal heat pumps when there is renovation, because tax reduction is already motivating. Renovation is in fact the main condition to profit by tax reduction.

Main recommendations to enhance the Italian tax measure

- *Improve the readability of the legal texts that present the measure and simplify the administrative procedures*

The NFA 2007 is considered to be sufficient as to its scope but the administrative complexity should be overcome by rationalizing the procedural rules and issuing a single text or guide, in clear and unambiguous language. The new NFA 2008 text appears to be a step in the right direction.

- *Introduce equipment and installation standards and quality labels*

It is one of the Italian measure's weaknesses and one of the reasons for its limited impact. If it is to reach the general public, the sector needs to assure it about the reliability of the equipment and installer's know-how. This aspect was previously built into the measure in the form of an energy efficiency certificate. However the system did not work because the cost of drawing up the certificate had to be borne by the householders (about €150) and it was issued after the application had been installed.

The best solution would be to tie eligibility for the measure to an equipment list with a label or standard testifying to its compliance with technical standards.

- *Improve communication on the measure*

More communication efforts have to be made to promote the tax measure widely and reach as many final consumers as possible, i.e. create professional RES info points, primarily by involving the installers, who are precious go-betweens for the consumers to a greater extent. The actors on the ground need clear, simple official documents to explain how the measure works and the financial returns householders may obtain on their purchase.