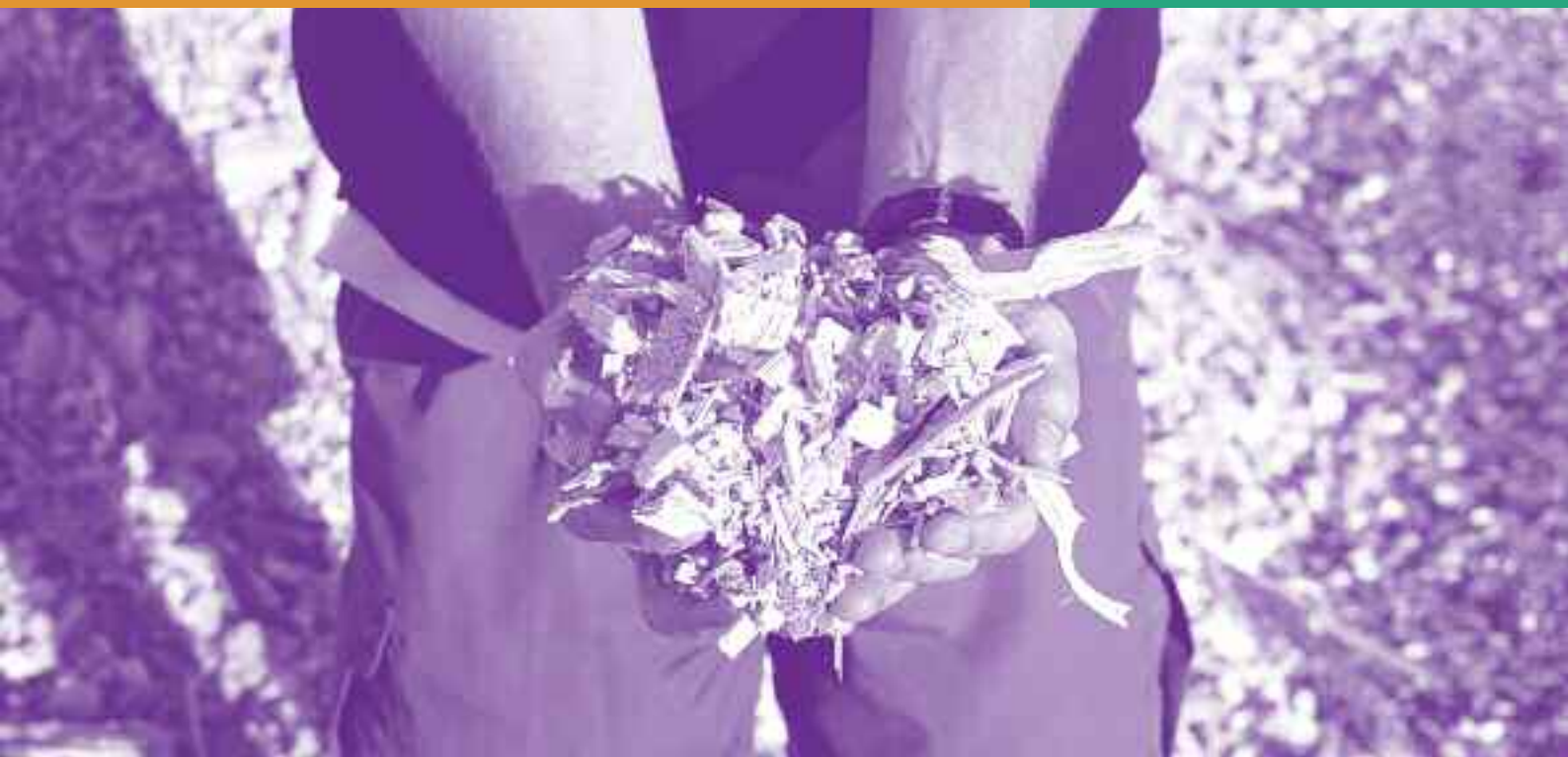




*Refund individual investment
in RES heating systems through direct
tax measures*

REFUND +

Are direct tax measures an efficient policy
tool to support individual investments
in RES heating systems?



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1. Background and objectives of the project

The main obstacle to the development of renewable energies for private households is related to the high investment cost of installations, which tend to be more expensive than mature and conventional technologies.

Direct tax measures (income tax credits, income tax reductions and tax allowances) are among the support instruments that have been used by member States to reduce this initial outlay, but their effects are not well-known.

The **REFUND +** project proposes a **bottom up evaluation of all different EU on-going experiences of direct tax measures** targeting individual investment in favour of RES sectors for residential heating.

Countries where these instruments currently exist are Austria, Belgium, France, Italy and Portugal. Thus, these countries have been covered in the project.

REFUND + spread over a period of 32 months. The project used a methodology that associated an economic study, a qualitative analysis and case studies in order to reach the following objectives:

- identification and monitoring of the impacts of these instruments in the five EU countries where they are currently implemented;
- comparison of the impacts of direct tax measures in these countries, so as to bring out and show best practices;
- identification of success or failure factors of these policies and the sharing of these findings via operational recommendations towards corrective actions for the measures already in place and definition of optimum application modalities for future systems;
- simulation of potential tax impacts on the Polish and Lithuanian markets and definition of best way forward;
- communication of recommendations to policy makers;
- information for industrialists about the interest aroused by the measure.

Notes

The base year used for the direct tax measures studied in the REFUND + project is 2006. Other national tax measures may have been implemented in Europe since then, but are not covered by our work. Greece is one case in point. It developed a tax base reduction scheme to support its solar thermal sector in 2007.

All graphs and tables are from following source: REFUND + 2009, except otherwise specified.

2. Country cases

Two analyses were carried out for each country, an economic analysis and a qualitative analysis, to identify the economic impact of each measure and describe its role in the purchasing act in finer detail. These observations have led to recommendations for improvement.

Tax allowance	Income tax reduction	Income tax credit
Austria (1979)	Belgium (2003)	France (2001)
	Italy (1998)	
Portugal (1991-1997) ➤	Portugal (since 1998)	

2.1. Three types of tax measure identified

- **Tax allowance:** a certain percentage of the equipment costs and possibly the labour costs may be deducted from the net taxable income.
- **Income tax credit:** a percentage of the equipment costs and possibly the labour costs may be reimbursed to the taxpayer against payable income tax for the fiscal year in which the investment was made. If the total payable tax is less than the deductible allowance, then the difference is paid to the taxpayer.
- **Income tax reduction (or tax deduction):** using the same principle as the previous measure, but when the deductible allowance is higher than the payable tax, the taxpayer does not receive the difference.

Main features of the tax measure studied (based on the year 2006)

Country	Incentive rate	Tax ceiling	Eligibility contingent on the equipment	Eligibility contingent on the installation	Eligibility contingent on the building
Austria	¹	€730	No	No	No
Belgium	40%	€1,280	Yes for wood boilers, solar thermal and GHP (e.g. efficiency and solar orientation)	Registered building constructor	Before 2005, owners only. Since 2005, owners and tenants
France	50%	€8,000 per adult ²	Yes for wood boilers, solar thermal and GHP (efficiency and equipment certification)	The appliance must be bought and installed by a professional	Main residence only
Italy	36%	€77,468	Not directly but the installation must be validated by an energy efficiency certificate	No	Building renovation only
Portugal	30%	€714	No	No	No

¹ RES investment (equipment and installation costs) deductible from the net income included in a pool of expenses (up to an annual amount of €2,920, a quarter of this amount actually reduces the taxable income). ² So €16,000 for a married couple.

2.2. Description of the measure functioning

The tax incentive rate basis indicates the investment % that is eligible for calculating the tax relief.

The tax ceiling in the case of Austria, Belgium and Portugal designates the maximum possible aid on an investment. In the case of France and Italy the ceiling designates the maximum expenditure giving entitlement to the measure. In the case of Italy the ceiling not only applies to householders' investments; businesses and local authorities also enjoy entitlement, which explains the high figure (cf. table page 4).



2.3. Austria: a complex instrument with no effects on the RES

The tax measure has played no part in developing individual renewable energy heat production applications. Furthermore, our economic analysis has shed light on the role played by regional subsidies. These, combined with the impact of the price of crude oil emerge as the main vectors behind the sales of renewable energy-based systems.

The main reasons for the failure of this measure are the complexity of its operating principle, and its unattractive level. Individual interviews conducted with panel of 30 consumers confirm our perception of a tax measure that has no impact on consumer decision-making.

Main recommendations for Austria

- > **Explicit item on the tax form for RES heating systems**
- > **No promotion of fossil systems on the same tax allowance scheme**
- > **Introduce technological eligibility criteria and standards into the scheme**
- > **Convert the tax allowance scheme into a tax credit scheme**
- > **Simplify the system and increase transparency**
- > **Increase the financial support level**
- > **More and better information**

	2003	2004	2005	2006
Evolution of the cost of the measure dedicated to RES (in millions of €)	2 - 3	2 - 3	2 - 3	2 - 3
Evolution of the share of the RES heating investment in the total cost of the tax measure	0.6 - 0.9%	0.6 - 0.9%	0.6 - 0.9%	0.6 - 0.9%
Evolution of the number of individual RES applications which benefited from tax measure	10,000	10,000	10,000	10,000
Evolution of the average financial support from the tax measure for individual RES application	200 - 300	200 - 300	200 - 300	200 - 300

2.4. Belgium: a measure limited by the predominance of energy efficiency operations

Despite a higher level of financial support in 2006, the Belgian tax reduction measure has had little direct impact on the growth of the renewable sectors. Both consumers and the trade tend to view the tax measure as a mechanism that backs up consumers' choices but has barely initiated new investments. The national and regional subsidies are the real drivers behind the growth of the renewable sectors.

The tax measure has been primarily used for investments geared to improving roof insulation or installing double glazing. These two items account for 95% of the tax measure budget in 2005 as against 4.4% for expenditure on renewables.

Best practices identified from Belgian experience

- Eligibility constraints regarding quality of equipments (performance) and installation (only registered installers)
- A good complementarity with regional support actions (incentive financial support once combined)

Main recommendations for Belgium

- Improve the information on the measure towards installers and consumers
- Introduce separate ceiling for each measure
- Spread investment made in 1 year over several taxable years
- Extend the measure to new buildings for wood boilers and increase the technical requirements about their efficiency

Belgium

	2003	2004	2005	2006
Evolution of the cost of the measure dedicated to RES (in millions of €)	1.16	2.17	3.79	7.54
Evolution of the share of the RES heating investment in the total cost of the tax measure	3%	4%	7%	5%
Evolution of the number of individual RES applications which benefited from tax measure	2,100	3,550	6,100	5,900
Evolution of the average financial support from the tax measure for individual RES application	552	611	621	1,278

This phenomenon, known as Trias Energeticas, describes the fact that household energy-saving investments are organised along three successive and distinct stages, namely: reducing energy consumption, then the development of renewables and finally optimising energy production from fossil energy. Belgium is still currently at stage one.

2.5. France: a successful instrument but with side effects to correct

The implementation of the 40% tax credit in 2005 (followed by 50% in 2006) has been a success. The growth dynamics recorded prior to this period were boosted by the introduction of the measure. The keys to its impact are primarily attractive incentive levels combined with the introduction of technical recommendations for equipment and installation that offer qualitative assurance.

Nevertheless we have observed some side effects of the growth, primarily the solar thermal price slide (over 7.6% of the mean annual growth rate between 2003 and 2006). However, the setting up of the tax credit in 2005 did not trigger this trend but it has snowballed as the French market has built up steam.

Tax credit costs and profits

Evaluations were done to estimate the direct and indirect economic benefits brought about by the French tax credit. The figures presented page 7 are about the direct profit generated from the market growth observed in two sectors targeted by the tax measure in France in 2006.

Employment, taxes and investment generated from tax credit activity in 2006

Sectors	Net Employment created	Added VAT and other taxes (millions of €)	Investment (millions of €)
Wood sector	1,355	50.5	35.2
Solar thermal	1,886	30.8	41.2
Total	3,241	81.3	76.4

Source: BIPE 2007

Net employment detailed the full time jobs newly created in each sector due to the activity growth during each year. Around 94% of the new jobs are in the industry and distribution branch. The other jobs are on the up-stream side of the wood sector (branch of the wood fuels) and in the installation activity.

Taxes represent the VAT collected on the market growth and professional taxes collected from the firms.

The investment part refers to amount of investment that companies had to make to deal with the increase demand.

The evaluation shows that the costs generated by tax credit to the wood energy and solar thermal sectors were covered by direct and indirect generated effects.

France

	2003	2004	2005	2006
Evolution of the cost of the measure dedicated to RES (in millions of €)	59	69.4	250.1	721.7
Evolution of the share of the RES heating investment in the total cost of the tax measure	16%	17,5%	25%	38%
Evolution of the number of individual RES applications which benefited from tax measure	155,800	193,400	239,150	399,250
Evolution of the average financial support from the tax measure for individual RES application	379	359	1,046	1,785

Best practices identified from French experience

- An incentive financial support (even for costly operations)
- Eligibility constraints regarding quality of equipment (performance and installation (not self installation))
- A good complementarity with the regional support actions (subsidies help to wait for the tax refund)
- An efficient communication campaign targeting all types of actors along the value chain

Main recommendations for France

- Complete the measure with other actions in order to help consumers during the period between the investment and the refund time
- Propose a new approach for the measure that combines various aspects of the measure in a global package
- Apply firmer limitation to avoid combination of too much support for one operation
- Try to control price increase
- Improve the installers' network
- Improve the communication campaign by centralising information

Comparison between the costs and the profits for 2006 (in millions of €)

Sectors	Cost of tax credit	Direct economic profits	Indirect profits
Wood Energy	286	85.7	105
Solar thermal	95.4	72	143
Total	381.4	157.7	248
			405.7

Source: BIPE - Observ'ER

Best practices identified from Italian experience

- An incentive financial support (even for costly operations)
- Continuity of the measure ensures stable framework for market players

Main recommendations for Italy

- Improve the readability of the legal texts that present the measure and simplify the administrative procedures
- Introduce equipment and installation standards and quality labels
- Improve communication on the measure primarily by involving the installers to a greater extent

2.6. Italy: an incentive instrument that has to be potentialized by simpler procedure

Despite an attractive financial incentive level, the Italian tax measure is a half-baked as a market driver. The sector's observers confirm that the bulk of the growth has been borne by regional aid, increasingly widespread recognition of the sector and tension over fossil energy prices which is pushing European consumers towards alternative solutions.

The qualitative interviews revealed that householders primarily viewed the aid as a bonus that supported their choices rather than originating the purchase. The tax reductions could have had a greater direct impact on sales with better publicity (especially from installers) and easier administrative procedures for the consumers.

The measure suffers from another drawback in the form of the absence of conditions set for the quality of the equipment installed and the installation itself. An energy performance certificate was provided for in the legal texts to guarantee installation quality but it came in after the work and its full cost had to be borne by the consumer. The certificate was abandoned in 2008.

Italy

	2003	2004	2005	2006
Evolution of the cost of the measure dedicated to RES (in millions of €)	n/a	n/a	33.3	39.2
Evolution of the number of individual RES applications which benefited from tax measure	6,000	8,000	13,000	16,000
Evolution of the average financial support from the tax measure for individual RES application	n/a	n/a	2,560	2,450

2.7. Portugal: the tax instrument was used in another field than RES

The main orientation of the tax reduction measure was to support Portuguese consumers' purchasing power primarily by allowing them to deduct the interest on their home loans from their taxes. There is very little awareness about the national tax instrument and thus it has hardly played a part in sector development. The effects of the economic downturn, in particular crude oil price fluctuations, have been much more decisive.

Lastly the absence of any equipment or installation label or standard has not done the sectors any favours. They suffer from a legacy of damaging examples in the 70s-80s that have tarnished the image of these sectors (e.g. solar thermal) in consumers' minds and it took the whole of the 1990s to restore confidence.

Main recommendations for Portugal

- *Isolate the RES part from other types of investment*
- *Increase the financial input especially for new RES technologies such as wood boilers or geothermal heat pumps*
- *Turn the tax deduction scheme into a tax credit scheme*
- *Introduce minimum efficiency criteria and quality standards through quality requirements for installers and appliances*
- *Implementation of the measure must be followed by a dissemination campaign. National and local energy agencies should be involved in this activity*

Portugal

	2003	2004	2005	2006
<i>Evolution of the cost of the measure dedicated to RES (in millions of €)</i>	5.13	4.98	5.42	6.32
<i>Evolution of the share of the RES heating investment in the total cost of the tax measure</i>	1.17%	1.09%	1.2%	1.31%
<i>Evolution of the number of individual RES applications which benefited from tax measure</i>	15,750	14,860	15,100	15,800
<i>Evolution of the average financial support from the tax measure for individual RES application</i>	326	335	359	400



3. Cross country analysis results

A cross analysis has been conducted on the basis of elements drawn from national economic and qualitative studies, to identify which elements contribute to the success and failure of the various measures observed.

3.1. Three categories of measures can be distinguished according to their impact and relevance to developing individual renewable applications

- Measures that clearly target the renewable sectors and have achieved their direct impact objective on the markets: French case.
- Measures that have visible renewable sections but lack direct impact: Belgian and Italian cases.
- Measures that do not emphasise their support of the renewables sectors and have no impact on the markets: Portuguese and Austrian cases.

3.2. Different user profiles were identified regarding their motivation to invest in the RES*

Two of them are represented in all countries:

- **the Ecologists:** they are preoccupied by impacts of their own behaviour on their environment. The installation of a RES equipment represents a way to act;
- **the Cautious:** they are unsure of their economic situation and are driven by the awareness that they can save money and energy with a new RES system.

Other user profiles were observed that were not common to all countries:

- **the TechnoDIY:** they are specifically present in France, Belgium and Portugal. Their motivations rely on their interest for the new RES technologies;
- **the group looking for comfort in Portugal:** for them investing in RES means above all more comfort and correspond to a new stage in life;
- **the Traditionalists in Austria:** they have an agricultural background and can't imagine using another type of central heating than wood boilers. This is family tradition based on ownership or of easy access to wood supply.

** These profiles are a construction of the analysis, they were not selected beforehand.*



3.3. The different roles of tax measures in the purchasing process

From the consumer angle

- A “*Triggering role*”: the end consumer would not have made the investment had the measure not existed.
- A “*Facilitating role*”: the fiscal incentive acted as an encouragement to carry out the investment planned.
- The “*Good surprise*”: the consumers would have made the investment even if the fiscal incentive had not existed.

From the professional angle

- The tax measure used as a sales pitch.
- In Portugal and Austria, the measure is more by way of information than an argument for sale.
- But on the whole, the measure is always perceived as support from the State for the RES sectors and their businesses.

3.4. The failure factors

- The choice of an opaque measure (such as the tax allowance)
- Renewable sectors that are ill-prepared to satisfy a rapid rise in demand
- Consumers unready for a renewable energies development phase (the Trias Energeticas example in Belgium)
- Measures that hardly cater for the specifics of renewable energies, if at all (Austria and Portugal)
- Too much administrative red-tape, particularly for householders
- The level of support combined to other subsidies does not bring the RES appliances to be competitive with conventional energies
- No coherence or complementarity between the tax measure and local subsidies
- Communication campaigns that leave out specific links in the equipment distribution chain

3.5. The success factors

Two preliminary statements:

- rise of fossil fuel prices: creates a good context for RES development, but is not sufficient as such;
- the existence of the tax measure in itself gives some credit to RES technologies.

The measures’ efficiency is higher when:

- the awareness of the instrument is important:
 - setting up special communication dedicated to the renewable sections of the measure;
 - setting up indicators and studies for monitoring purposes which enable adaptations.
 - the installers’ network promotes the measure’s existence;
- the tax credit instrument is chosen because it is viewed as being the most socially egalitarian and fair;
- the tax measure is applied after the commercial take-off of the targeted sectors;
- distinct levels of financial support for each individual renewable sector are clearly indicated and ensure that there is no bias in favour of one sector or technology;
- the rate reduction level is psychologically significant for the public;
- the implementation of equipment or installation quality labels and standards.



4. Implementation simulations in two case studies: Lithuania and Poland

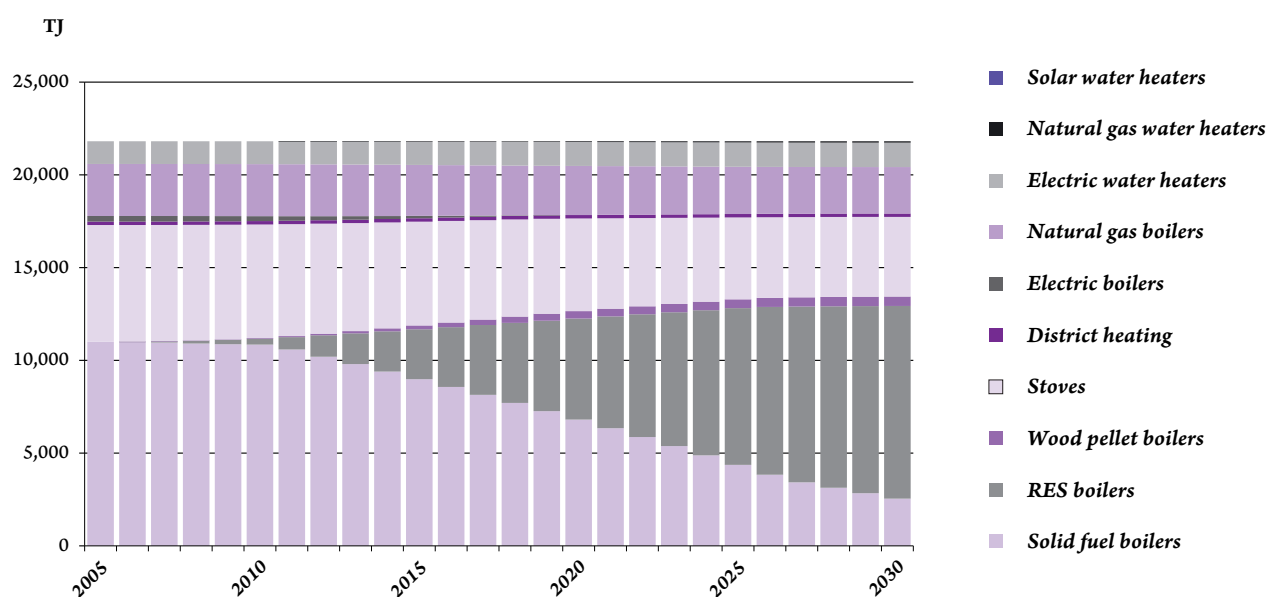
At the same time as it was conducting its specific European country case studies, the REFUND + project analysed the relevance of introducing direct tax measures to develop the thermal renewable sectors in two new member countries, Lithuania and Poland.

4.1. Lithuanian findings

- Introduction of effective support schemes on investments to support individual investment in RES-Heat appliances will significantly change the stock of heating technologies (boilers) but will have only moderate impact on RES (wood) consumption in Lithuanian household sector.
- Looking at the RES penetration rate, rational support is about:
 - 20-30% of total installation cost or
 - 40-50% of the equipment cost.
- Estimated increase of RES (wood) consumption may reach 2.9% in 2015 and 17.1% in 2030.
- Reduction of total fuel consumption in 2030 would be 3.5% in the case of high fuel price scenarios and high discount rate, and 6.9% in the case of low fuel price scenarios and low discount factor.
- Support of over 40% of total installation cost would provide solar collectors with the opportunity to compete with electrical water heating and support of about 85% would make them competitive with gas water heating.
- Due to the high expected electricity price, heat pumps become economically attractive only if there is 100% support on investments.
- Since the beginning of 2009, Lithuanians' incomes are taxed at a rate of 15%. As low-income inhabitants pay low taxes, the potential benefit from tax allowances or tax deduction schemes is low and it does not play a triggering role for investments in new RES heating technologies.
- The current Lithuanian tax allowance scheme (for the moment not applied to RES heating systems), allowing deduction up to 25% from taxable income, is oriented towards high-income households. In order to make this financial promotion scheme more attractive for inhabitants with lower income at least bound of mentioned 25% should be increased.
- Tax deduction scheme will be limited tool as social payments are the main income source for one third of Lithuanian households, which cannot use this support scheme.

LITHUANIA – The dynamics of total heat production (for space heating and hot water preparation) by technology in the event of 50% financial support of all installation costs for RES technologies

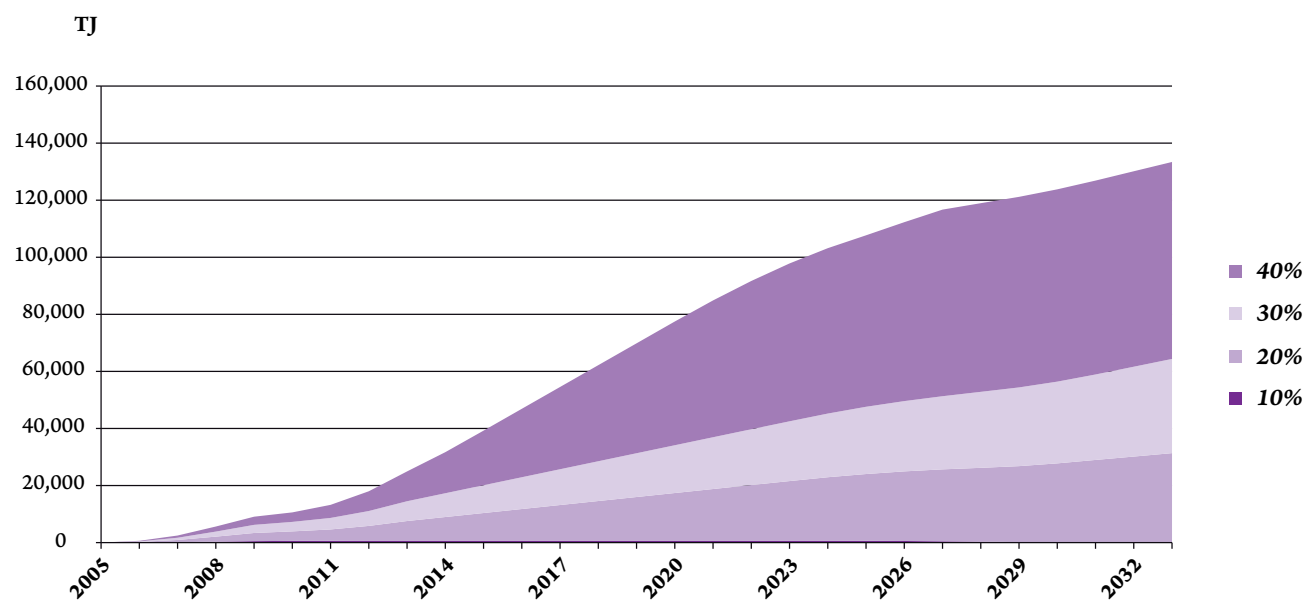
Source: LEI 2009



- A tax credit scheme has the highest potential to achieve the expected results on implementation of RES heating systems. However, this instrument is not in the Lithuanian fiscal culture and tradition and government may be reluctant to implement this type of measure.
- Income of Lithuanian inhabitants are taxed by 15% level. As low-income inhabitants pay low taxes, the potential benefits from tax allowance or tax deduction is low and it does not play a triggering role for investment on new RES heating technologies. Having this in mind and taking into account that social payments are the main income source for one third of Lithuanian households, tax deduction cannot be applied and implementation of RES heating support scheme that is not related to tax system should be considered.

4.2. Polish findings

- Introduction of effective support schemes on investments to support individual investment in RES-Heat appliances will change the stock of heating technologies.
- Looking at the RES penetration rate, rational support is about:



In all five countries covered in our project, direct tax measures appeared to be a flexible and powerful policy tool that can be targeted to promote and encourage specific renewable energy technologies and influence selected renewable energy consumers.

Successful tax measures to promote individual investment in renewable energy heating appliances:

- must be of adequate in size, scope and length to be effective in influencing consumption decisions;*
- must be tailored according to the state of renewable energy sector maturity in the country;*
- must be carefully designed to account for interactions with other national or regional policies;*
- must require other supportive actions to create secure and stable surroundings for market actors and end-consumers.*

