



Deliverable 2.1

Analysis of the different working models

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2. BACKGROUND

The PINE Project aims at developing energy efficiency in European companies, mainly in SMEs, to help them reduce their energy costs, thus becoming more competitive and contributing to mitigate the climatic change due to the GHG emissions. More than 200 companies will be conducted and 40 audited at each participating country of the consortium, to finally identify energy efficiency actions and implement them in at least 20 SMEs per country.

However, the energy efficiency measures could not be equally applied in all countries since the existing legislation may impose different restrictions depending on the country. It is, thus, mandatory to make a situation analysis per country to check the legal limitations per country, and assess the different aid programs in force in every country. This is covered in section 5.

In order to assess the energy saving potential of a company, it is imperative to perform energy audits. Two energy audits per company will be carried out during the project. However, the project has to set the basis for future action after the project ends. Audits will still be necessary but the business model applied will not be the same. Therefore, it is deemed important to know the current existing business models that are currently in use in the project consortium countries, check the advantages and disadvantages of each one, and make a recommendation of a possible model to be applied once the project comes to an end. This is the objective of sections 3 and 4.

3. INVENTORY OF BUSINESS MODELS IN USE UP TO DATE

The first item to start an energy efficiency project is to know the consumptions and inefficiencies of a production system. The best way is by performing energy audits to unveil the saving potential and use this data to select investments on a return on investment approach. Energy audits cost money, as they involve an amount of time and resources by skilled professionals, but they do not necessarily involve a return on investment. Returns are

based on savings and savings can only be obtained after a thorough audit has been done, and the corresponding saving measures taken.

Since audits are the first step to achieve savings but there is no direct benefit from them, they are usually fostered by national regulations. The new EU directive still in progress will make audits compulsory for big companies, and will set incentives for SMEs to carry them out. While waiting for this directive to come out, some public authorities have already legislated about it. The business models existing in each country depend very much on the ruling policies set by the national and regional legislations to promote energy audits in companies, and the level of subsidies and aids related to energy audits.

Project partners were requested to make a short overview of the existing policies about energy audits in companies. Here below there is a summary of their inputs.

- **Austria:** WIN program

WIN - Wirtschaftsinitiative Nachhaltigkeit funds provided by the federal state government of Styria. WIN is an initiative by the Styrian regional government together with the Chamber of commerce, supported by the Austrian ministry of the environment. It supports consulting projects for a more sustainable development of Styrian SMEs and industries. It is basically structured in three areas: Strategic aspects of sustainable development (sustainability reporting, CSR, sustainable balanced score cards), Environmental and integrated management systems and resource efficiency (waste minimisation, energy efficiency, etc.) Link: <http://www.win.steiermark.at>

- **Spain:** E4 Plan

E4 Plan is a plan for Energy Efficiency from IDAE which is the national energy authority (Institute of energy efficiency and diversification), depending from the Ministry of Industry and Energy. E4 is the current national energy efficiency plan in force, by IDEA (Ministry of Industry and Energy), Funds are distributed regionally by local governments. The rest is paid by the audit beneficiary. They can cover up to 75% of the total audit cost, capped at a maximum of 25000€.

www.idae.es

- **Italy:** White Certificate

The system is based on the obligation, imposed on electricity and natural gas DSOs with more than 50,000 customers, to meet specific targets expressed as primary energy savings aimed at increasing end-use energy efficiency. The white certificates are documents certifying that a certain reduction of energy consumption has been attained. Under such a system, producers, suppliers or distributors of electricity, gas and oil are required to undertake energy efficiency measures for the final user that are

consistent with a pre-defined percentage of their annual energy deliverance. If energy producers do not meet the mandated target for energy consumption they are required to pay a penalty. In most applications, the white certificates are tradable: the white certificates are given to the producers whenever an amount of energy is saved whereupon the producer can use the certificate for their own target compliance or can be sold to (other) parties who cannot meet their targets. http://www.autorita.energia.it/it/operatori/operatori_ee.htm

There are no tax benefits or public funds in support of these certifications. The benefit for the SMEs is avoiding a penalty related to the lack of conformity with the laws.

- **Bulgaria: OP**

The Operational programme "Development of the Competitiveness of the Bulgarian Economy" OP, is one of the seven operational programmes under the National Strategic Reference Framework. The Programme is funded by the European Regional Development Fund and co-financed from the national budget. The total amount of the public resources is around 1,1 bill. euro. The Priority Axis 2.1 funds actions which aim at introduction of energy saving technologies (including energy audits), as well as utilisation of renewable energy resources by Bulgarian SMEs. The Programme is managed by the Ministry of Economy, Energy and Tourism (www.opcompetitiveness.bg); the percentage funded varies from 30 to 50, but usually it is 40%, and the rest 60% have to be ensured by the applying companies.

The public funds are supplied by two sources: the ERDF (European Regional Development Fund), and by the Bulgarian national budget. There is no minimal limit; the maximal public funding can reach 2,000,000 levs (EUR 1,022,583 as according to the fixed rate LEV/EUR). The projects include not only energy audits, but also implementation of EE measures and introduction of RES.

- **Romania: PNAEE**

The Second National Plan for Energy Efficiency PNAEE 2011 - 2020 (project stage) by the Ministry of Economy, Commerce and Business (MECMA) is the second national energy efficiency plan in the project stage by the Ministry of Economy, Commerce and Business (MECMA) <http://oie.minind.ro>; ANRE (National Authority for Energy Regulations) recommended as the second PNAEE to include and the main measures for increase of energy efficiency, promotion subsidies for support of energy audits in industry sector and creation of energy auditors association in this sector, also. Additional information: Based on the collaboration agreement concluded between the Ministry of Economy, Commerce and Business (MECMA) from Romania and the Ministry of Economy and Commerce from Netherlands, Romania benefited of the

technical assistance regarding to improve of energy efficiency in different industry sectors, by the procedure Long Time Agreements (LTA).

The company SenterNoverm from Netherlands, designated by Ministry of Economy from Netherlands to supporting of implementation LTA in Romania, concluded a Pilot Project, regarding to support for free energy audit for the company PROMEX Braila, in order to be used as good example for different companies from industry sector, establishing the main measures for energy efficiency in order to applied by Promex Braila company also.

The end of this project had to be followed by negotiations with Promex company and other companies from industry sector, in order to concluding the LTA.

A lack of any subsidy for the companies from industry sector stopped these negotiations yet.

- **Slovakia:** Ministry of Economy

The Energy Audit plan is set by the Ministry of Economy of Slovak Republic. The Act No. 476/2008 Coll. on Energy Efficiency defines the energy audits and in general energy services. The other supporting documents e.g. draft model contracts for industry, are in preparation. EU Structural Funds (MoE) and model SLOVSEFF II - projects are focused on renewal of heat generation installations, heat and compressed air distribution systems, the thermal insulation of industrial buildings and energy management. More details at www.slovseff.eu and www.mhr.sk.

- **Cyprus:** Energy Efficiency Law.

In Cyprus there is the “Guide for Energy Audits” edited by the Energy Service, a department of the Ministry of Commerce, Industry and Tourism of Cyprus, is an Energy Audit Guide for buildings, industrial installations, industrial processes and farming installations.. Act No. 171/2012 (07/05/2012) follows Law 31(I)/2009 (Law concerning energy efficiency during final use and energy services). www.mcit.gov.cy.

It is important to know the origin of the public funds, usually national with the exception of Austria, which is provided by the region of Styria. All the incentives provided by this model are given by means of subsidies, contributing to a percentage of the total audit cost, the rest being paid by the beneficiary company. The following table describes the available data about each of these programmes.

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Name	Country	Public funds			Percentage of the funds	Tax benefits	Audit costs	
		national	regional	local			fix costs	share of savings achieved
<i>Name of the audit model and authority who provides the funds</i>	<i>Country where this model is applied</i>	<i>Mark if the funds are from a national, regional or local authority</i>			<i>Percentage of the total audit costs which are financed by public fund. e.g. 50 % public funds, 50 % company</i>	<i>Mark if the model is affected by a Tax benefit policy for the company</i>	<i>Mark one of the options. Fix audit costs or costs covered by a share of the expected savings</i>	
WIN - Wirtschaftsiniciative Nachhaltigkeit funds provided by the federal state government of Styria	Austria		x*		50 % public funds, 50 % company	NONE	X	
E4 Plan for Energy Efficiency from IDAE	Spain	X			75 % public funds, 25 % company	NONE	X	
WHITE CERTIFICATE	Italy	x				NONE	X	
Operational programme "Development of the Competitiveness of the Bulgarian Economy"	Bulgaria	X			30-50% public (usually 40%), and the rest 70-50% (usually 60%) by the company		X	
The Second National Plan for Energy Efficiency PNAEE 2011 - 2020 (project stage) by the Ministry of Economy, Commerce and Business (MECMA)	Romania	x						
Energy Audit by Ministry of Economy of Slovak Republic	Slovakia	x			10 – 40/50 % financed from EU sources, 50 % company	NONE	x	

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Guide for Energy Audits. Energy Service , a department of the Ministry of Commerce, Industry and Tourism of Cyprus	Cyprus	x			15%,25%,35% depending on the size of the business (large, medium,small respectively)	NONE	x	
ESCO	Italy / all	NONE	NONE	NONE	NONE	NONE	X	X

Table 1: energy audit business model compilation table.

The last model in the table is not supported by public aids. Actually this is the common model used by ESCOs¹ in an incipient market that is growing every day. In order to commit to an energy saving rate it is necessary to carry out an energy audit. The cost of the audit is either paid by the customer or it is paid back by the project savings at a later stage. These savings are used to compensate the financial investment, remunerate the ESCO and incentivize the customer to contract the service. The two main ESCO’s business models are:

- Warranty savings. The ESCO commits to pay a fixed given amount of money. If the savings are greater the ESCO benefits increases, if the savings are lower the ESCO does not get any benefit and may incur in losses.
- Shared savings. The ESCO and the customer agree to share the savings, whatever they are, according to a given percentage.

The ESCO business models applied to the energy audit are summarized in the following table. The A model is “On demand service”, that is fully paid by the customer requesting it. B and C match the ESCO business model. If the audit shows not enough saving potential, the customer does not enjoy any benefit at all and the ESCO covers the auditing cost. In case the savings are estimated to be large enough, two possible ways may happen: The customer accepts the energy saving contract and the audit cost is usually advanced by the ESCO and recovered along the project as savings occur. However the customer may reject the service and in this case there is no other way for the ESCO to get the costs back but to charge the customer according to a pre-contract that has been signed before the audit takes place.

Finally there is another general auditing model worth mentioning that is called “revolving funds”. This system is widely used in the USA. A funding is allocated to a specific purpose, in this case, energy audits. Once the investment has been paid back the money is refunded and invested again in another audit. Repayments are applied for the same purpose over and over. This system may or may not work along with other public funding schemes.

¹ ESCO: Energy Service Company. Companies that provide services related to energy whose incomes are based on energy savings.

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Classification	Name	Description	Class	Options	Who pays the audits?	audit price?
A	One time service on demand	Customer requests the service and pays for it	A1	with subsidy	Customer + subsidy.	fixed price
			A2	without subsidy	Customer	fixed price
B	Warranty savings contract	Initial audit to evaluate energy savings to sign a Warranty Savings contract	B1		ESCO	No price
			B2	contract accepted	Customer, cost included in contract	included
					Customer, cost included in a precontract	fixed price
			B2.2	contract rejected		
C	Shared savings contract	Initial audit to evaluate energy savings to sign a Shared Savings contract	C1		ESCO	No price
			C2	contract accepted	Customer, cost included in contract	included
					Customer, cost included in a precontract	fixed price
			C2.2	contract rejected		
D	Revolving funds	A funding is allocated to energy audits. Repayments are applied for the same purpose over and over.	D1		Public Administration Repayments paid by customer	fixed price
			D2	Company pays	Company + PA Repayments paid by customer	fixed price
					ESCO pays	ESCO + PA Repayments paid by ESCO
			D2.2	ESCO pays		

Table 2: General business model inventory

All of the aforementioned public supported business models in place in the different countries are type A from this general model inventory, except the ESCO model which is B and/or C. In the case of Bulgaria, the operational programme can also be considered type B since the company performs an energy audit, and based on that audit, it can apply for funding for the implementation of the EE measures, including the costs for the audit. The grant agreement between the company and the Ministry includes a compulsory condition that at least 10% energy savings based on the initial audit should be achieved.

4. COMPARISON AND BENCHMARK OF THE DIFFERENT MODELS AND STANDARDS.

All systems are similar except for the Italian “White Certificates”. This is the equivalent to the “Green Certificates” for energy produced by means of renewable sources. These certificates are issued when certain efficiency in the use of energy has been attained. They are limited, they correspond to an energy saving and they are tradable. In other words, a company can decide whether to meet its target of energy efficiency by means of implementing energy efficiency measures, or by purchasing white certificates to other companies who have excelled their targets. The system is very efficient as long as there is fair trade. Otherwise there might

be speculation over the value and quantity of the certificates, that may represent more value or energy saved that they actually do.

Other remarkable differences are in the scope of the aiding programmes. While some countries restrict to energy efficiency initiatives, others like the Austrian WIN cover all kind of consultancy projects referring to sustainable development, like CSR, environmental management systems,... What it is true is that no system restrains to energy audits themselves, and usually they go beyond to cover energy efficiency measures. Energy audits have little meaning if they are not followed by efficiency actions. Only Spanish E4 subsidies may cover energy audits only, and with the greatest coverage rate, up to 75% cost. Therefore, it seems an expensive and ineffective programme.

The Bulgarian programme, financed by EU funds, covering an average of 40% of the costs and demanding a minimum 10% energy savings seems to be more effective, as it ensures the implementation of energy saving measures with a minimum result warranty.

In terms of the funding scheme, Romania, Slovakia and Bulgaria are supported by the European Regional Development Fund and co-financed by the respective national budgets. All the programmes are based on subsidies covering a percentage of the investment. Only in the case of Italy there is tax abatements from the Italian Revenue Agency. The incentives coming from fiscal benefits are a powerful tool to be explored and further used for future programs as they are usually more economically sustainable since it is a reverse economic flow for the State finances but it is produced once the tax object has been produced.

Another interesting item is the selective coverage level of the Energy Efficiency law in Cyprus, where there are available aids of 15%,25% or 35% depending on the size of the business (large, medium or small respectively).

Another remarkable thing is that the energy audits that fit into any of the public funded programmes are that energy audits are paid on fixed cost basis, except for the ESCO model. The public funded programmes are usually very effective but the obvious limitations of this kind of programmes are the amount of budget allocated to them. Once those budgets are depleted, users wait for the next call to obtain one, thus limiting the scope of the audits benefit. This problem is fixed in the ESCO system as it relies on private funds mainly. However they are also limited by the financial resources. Usually banks are reluctant to finance as they assume they are assuming a double risk: for the applicant ESCO and for the final customer. Since the payback by means of savings only is usually large, this implies an additional source of risk. In these downturn times all parts tend to reduce risks and therefore, energy efficiency investments to 10 years loans or above are often turned down.

The ideal system could mix both, ESCO model of private funding where all involved parts assume part of the risk (ESCO, customer and financial institution), those risks and the

consequences are clearly stated on the contracts. If the initial cost of the investment is reduced by means of a subsidy, the payback time gets significantly reduced and so does the project risk.

In the following table there is a comparison country by country of the different models referring to the origin and coverage of the subsidies, on the existence of related regulations for the Energy Efficiency and for the ESCO sector, It shows that no countries have a regulated ESCO market. However all of them have some kind of EE regulations in place. This part will be explained in detail in section 5.

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Partner	Country	Subsidy level	EE public Subsidies	Who?	what for?	frequency	% coverage	ESCO related regulations?	EE related regulation in industry?	who regulates?	Tax benefits	National Energy saving action plan	Name	Who leads?	
CIRCE	Spain	National	Yes	IOAE	All	annual	75%	No	Yes	IOAE PSE	No tax benefit	Yes	Plan Et En	IOAE	
		Regional	Yes	Gov. Of Aragón	All	annual	30%								
		Local													
AREA	Italy	National	Yes	Ministry of Economic development	All	annual		No	Yes	Energy Market Administrator	No tax benefit	Yes	PAEC 2011	Ministry of Economic development	
		National	Yes	Italian Revenue Agency	Other	annual		55% No				Abolishment			
		National	Yes	Ministry of the Environment	Energy mgmt system	annual		0.5% interest No				No tax benefit			
		Regional	No												
		Local	No												
REAP	Bulgaria	National	Yes	Ministry of Economy, Energy and Tourism	All	annual		40% No	Yes	Sustainable Energy Development Agency	No tax benefit	Yes	2nd National Energy Efficiency Action Plan	The EE Plan - Council of Ministers of Republic of Bulgaria	
		Regional													
		Local													
TUK	Slovakia	National	Yes	Min. of Economy	Energy audits	annual			Yes	MoE	No tax benefit	Yes	Energy Efficiency Action Plan for the years 2011 - 2013	MoE	
		Regional													
		Local													
IPA	Romania	National	Yes	MECMA - OIE	Improved process and eq.			No	Yes	MECMA - PINE	No tax benefit	Yes	PINEE 2011	MECMA	
		Regional													
		Local													
STEMUM	Austria	National	Yes	Syrian regional government	All	annual		No	Yes	Austrian Ministry of Environ	No tax benefit	Yes		Austrian Ministry of Environ	
		Regional													
		Local													
STRATAGEFM	Cyprus	National	Yes	Ministry of commerce, industry and tourism	All	annual		15%, 25%, 35% Yes			No tax benefit	Yes	2nd National Energy Efficiency Action Plan July 2011	Ministry of commerce, industry and tourism	
		Regional													
		Local													

5. LEGAL RESTRICTIONS AND PUBLIC AIDS AVAILABLE.

This section has the aim of showing the main characteristics of the energy efficiency state of the art in each country involved in the PINE's project.

In all countries there are subsidies to improve the energy efficiency in the industrial sector, but the level of coverage is very different. In the following table it is shown the scope of those subsidies:

Romania:	National	X	Regional		Local	
Austria:	National	X	Regional	X	Local	
Italy:	National	X	Regional	X	Local	X
Spain:	National	X	Regional	X	Local	
Bulgaria:	National	X	Regional		Local	
Slovakia:	National	X	Regional		Local	

Table 3: Scope of the subsidies

In all countries subsidies are nation-wide, but in Austria, Spain and Italy regional governments also offer some. Moreover in Italy there are also local administration subsidies.

The entities that offer the subsidies in the countries are the following:

Romania: the national subsidies are called Romanian Funds for Energy Efficiency (FREE), there are not directly subsidies, and they are credits with a low interest for increase the energy efficiency in industries. The entity that manages the founding is the Organism Intermediar Pentru Energie (OIE) that depends of the Ministry of Economy, Commerce and Business (MECMA). The webpages of the entities are www.free.org.ro and www.oie.minind.ro.

Austria: the scope of the subsidies is both national and regional. The first one is management by the Kommunal Kredit and the last one by the Wirtschaftsinitiative Nachhaltigkeit. There are more information about the national subsidies in www.publicconsulting.at/kpc/de/home/ and about regional in www.win.steiermark.at/.

Italy: This is the country in which there are more administrations that offer different levels of subsidies. The administration that manages the programme at national level is the Ministero dello Sviluppo Economico, the regional subsidies come from the regional governments. As an example in the Region of Trieste is Friuli Venezia Giulia and the local subsidies depend of the local administration like municipalities or other similar. More information for national subsidies in www.sviluppoeconomico.gov.it/ and for regional go to the Trieste's area in: www.regione.fvg.it.

Spain: There are both national and regional subsidies. The first one is from the National Institute of Energy saving and Diversification (IDAE) that depends from the Ministry of Industry and Energy. The regional aids are from the Department of Industry and Innovation of Aragon Government. There more information in about the calls in www.idae.es and www.aragon.es .

Bulgaria: In Bulgaria the level of the subsidies is national and the entity that offers them is the Ministry of Economy, Energy and Tourism. More information in: www.opcompetitiveness.bg

Slovakia: Like in the more part of the countries there are also subsidies from national level, the fundings are calls Slovakia Sustainable Energy Finance Facility. More information in: www.mhsr.sk, www.siea.sk, www.envirofond.sk, www.slovseff.eu.

Related with the frequency of the subsidies in the different countries the following table shows them:

	National	Regional	Local
ROMANIA	According to individual calls		
AUSTRIA	Annual	Annual	
ITALY	Annual	According to individual calls	According to individual calls
SPAIN	Annual	Annual	
BULGARIA	According to individual calls		
SLOVAKIA	According to individual calls		

Table 4: Frequency of the subsidies

There is not a pre-established frequency of publication and most subsidies depend on individual calls. However the technologies benefiting of the aids are very similar in all cases. As shown in Table 3, in all countries it is possible to subsidize an energy management system or technology to improve a process, but the energy audits is only possible to be subsidized in all countries except Romania and Italy.

In relation with the total cost that can be subsidized the range are very similar in all the countries and they depend on the scope of the aids and the technology to be implemented. The following table shows the percentage of the total cost that can be financed by the subsidies according the type of technology in each country.

	Energy audits	Energy Management systems	Technology to improve industrial processes
Romania			
Austria	50 %	50 %	50 % for consulting and (10 – 30 %) for investment cost
Italy		Depending of the call and the budget	Depending of the call and the budget

Spain	75 % with the limit of 22.500 € by audit	30 % with the limit of 1.2 M€ by project	30 % with the limit of 1.2 M€ by project
Bulgaria	40 %	40 %	40 %
Slovakia	65 %	50 – 60 %	50 %

Table 5: Percentage of the total cost that can be financed by country and application

In this report not only the subsidies that are offered in the industrial sector are important, the situation of the industrial sector, the contribution to the national energy consumption and the current efficiency situation in each country is also important to analyze. For this reason a comparison between the industrial consumption in the different countries is developing.

The percentage of final energy consumption that corresponds to the industrial sector is:

ROMANIA	Final Energy
AUSTRIA	Final Energy: 36 %
ITALY	Final Energy: 23 %
SPAIN	Final Energy: 28 %
BULGARIA	Final Energy: 28,6 %
SLOVAKIA	Final Energy: 33,45 %

Table 6: percentage of the final energy consumption in each country

The value of final energy consumption that corresponds to the industrial sector is:

ROMANIA	Final Energy
AUSTRIA	Final Energy: 8.643 ktoe
ITALY	Final Energy: 31.610 ktoe
SPAIN	Final Energy: 28.209 ktoe
BULGARIA	Final Energy: 2.400 ktoe
SLOVAKIA	Final Energy: 3.106 ktoe

Table 71: final energy consumption in each country

The annual GHG emissions that correspond to the industrial sector is:

ROMANIA	¿? (CO2)/year
AUSTRIA	22.270 kton (CO2)/year
ITALY	474.148 kton (CO2)/year
SPAIN	105.738 kton (CO2)/year
BULGARIA	18.700 kton (CO2)/year
SLOVAKIA	10.800 kton (CO2)/year

Table 8: GDP in each country

With respect to the legislation that promotes the energy efficiency in the industrial sectors by means of the Energy Service Companies, only in Slovakia there are legislation that incentive it but in all the countries are operative national energy saving action plans.

Moreover the subsidies could be other types of tax benefits; the state of them in the countries is shown by the Table 7:

	Tax abatement	Tax exemption	Tax Deduction
ROMANIA	NO	NO	NO
AUSTRIA	NO	NO	NO
ITALY	NO	YES	YES
SPAIN	NO	NO	NO
BULGARIA	NO	NO	NO
SLOVAKIA	NO	NO	NO

Table 9: Tax benefits in different countries

Since the PINE project will support the SME's by means of the training and coaching is important to analyze if there are other types of training programs that promotes the energy efficiency in the industrial sector.

In all the countries there are different types of training programs, the entities offering them are the following:

Romania: There are different regional agencies that promotes courses like the Agency for Energy Efficiency and Renewable Energy of Ploiesti and Agency of Brasov for the Management for Energy and Environment.

Austria: There are specific courses for energy managers offered by the Chamber of commerce.

Italy: There are courses for energy auditors. The entity that organizes them is the Italian Federation for the Rational Use of Energy. www.fire-italia.it in a regional level is the National Agency for New Technologies, Energy and Sustainable Economic Development www.sede.enea.it/opportunita/formazione.html and in the region of Venezia <http://www.ape.fvg.it/formazione/corso-enea-energy-manager-a-udine>

Spain: There are different kinds of courses as well as possibilities to finance some of them by the State. The entity that offers training activities directed to employed and unemployed people in Spain is the National Employment Institute, in Aragon this entity is called INAEM and there is more information about incoming courses at: <http://plan.aragon.es/MapaRec.nsf/General>

Bulgaria: There are not courses financed by the State. But there are two training courses to train energy auditors.

Slovakia: The Slovak Innovation and Energy Agency.

In conclusion, in all the countries are subsidies or training activities in energy efficiency in the industrial sector but the condition and the scope of them are particular in each one. To conclude, a list of national best practices is shown as an example of energy efficiency in the industrial sectors:

Some examples of best practices per country

Best practice of ROMANIA:

Name of the company: Machine Plant UNIO Satu Mare – county Satu Mare (Transilvania)

Technologies implant: Replacement the air compressors with piston by helical compressors

CO2 save by the measure: 1.530 Tone CO2/year

Results: Energy saving: 440 tep/year

More information: <http://www.free.org> (the section “Case study”)

Resume of the save energy measure:

The main advantages for the new technological solutions implemented:

High efficiency: full automation of compressors, by a correct supervisory of compressed air requirements, decreasing energy consumption ;

Full automation of operation is not necessary permanent supervisory;

Small maintenance costs.

Annual Savings (in money) :

Energy: 78.500 euro

Maintenance costs & others: 7000 euro

Best practice of AUSTRIA:

Name of the company: Garant-Tiernahrung Ges.m.b.H (Garant Animal Nutrition)

Technologies implant: see below

CO2 save by the measure: 68 t CO2/a

Results: 450 MWh/a

More

information: http://www.win.steiermark.at/cms/dokumente/11353110_10343237/2480ff86/WIN_TB_2010_RZ_www.pdf (just available in German)

Resume of the save energy measure:

The company’s product range includes complete feedstuffs, feed supplements, concentrates, mineral feed, ensiling agents, preservatives and hygiene products. The animal feed plant in Graz produces approx. 58,000 tons of animal feed per year.

Measures implemented and savings made:

Insulation of the steam pipes: 31,000 Nm3 of natural gas and reductions of 68 tons of CO2 emissions per year – equaling savings of 11,500 Euros per year.

Heat recovery from the condenser to heat the molasses and/or rapeseed oil tanks:
reduction of natural gas consumption by approx. 14,000 Nm³ per year

All in all, the costs of natural gas could be reduced by 29,000 Euros per year.

Best practice of ITALY:

Name of the company: SEKAT S.R.L. (active in the **telecommunications and security filed**)

Technologies implant: Requalification of the winter and summer air-conditioning system thanks to the change of thermal plants with 35 monosplit and heating pump engines; PV system installation with 42,20 kWp, that satisfies the whole Electrical energy needs;

CO2 save by the measure: The PV system produces 52.000 kWh/year, therefore the CO2 savings per year are 27.600 kg (9,7 TEP saved/year).

Results: The requalification of the winter and summer air-conditioning system allows a cost saving of 44%.

Best practice of SPAIN

Name of the company: Pikolin

Technologies implant: several (improve the Heat and ventilation air condition system).

CO2 save by the measure: 210 Ton CO2/year

Results: annual energy saving 3.014 MWh

More information: Energy in Aragon. Government of Aragon

Resume of the save energy measure:

The Pikolin group has an annual turnover of 350 million € and is the leader in the mattress sector in Spain, France and Portugal.

The factory in Zaragoza is one of the world's largest mattress factories with 180.000 m² surface and employing 1.100 people in Spain.

One of the main measures in energy efficiency implemented in Zaragoza factory is the replacement of diesel heaters with a natural gas heating systems.

In addition to the environmental benefits the system uses air to air exchange technology with guarantees a high performance as there is no need for the air to go through intermediate fluids.

The company implements also the following energy efficiency actions:

Energy audit

Replacing the fuel in use. Stepping from diesel to propane as intermediate fuel and moving later on to natural gas

Incorporating engine variable frequency drives

Moving from 220 V to three – phase 400 V to minimize losses.

Best practice of BULGARIA:

Name of the company: Kauchuk J.S.

Technologies implant: several measures which were aiming primarily to reduce the consumption of steam.

CO2 save by the measure: 633.11 Ton CO2/year

Results: annual energy saving 2 563.2 MWh

More information: Energy Department in Kauchuk. REAP.

Resume of the save energy measure

Kauchuk J.S. is a Bulgarian producer of rubber products. It was established in 1930 and in 1981 on a new area of 313 730 sq. m a new plant was putted into operation. Kauchuk J.S. is a producer of conveyor belts, rubber hoses, reclaimed rubber and a large variety of rubber technical goods. The annual production is at rate of 600 000 m conveyor belts, 5 000 000 m rubber hoses and 1 000 tones reclaimed rubber.

The company implemented so far the following energy efficiency actions:

Energy audit

The company uses black fuel oil for technological processes, and that fuel is being stored inside two containers. Each one has a capacity of 100 tons. The temperature of the black fuel oil inside those containers should be at least 70° C. Steam heating of those containers was substituted by self-regulating heat-tracing cables. This results in savings of 5 tons of steam / hour that were used for heating the containers before introduction of that measure.

An automatic regulating junction was installed at each terminal of the steam heating, which maintains constant pressure of the steam supplied to each consuming unit depending on the current consumption.

The old insulation of the steam grid was substituted by new energy efficient one

Best practice of SLOVAKIA:

Name of the company: CHEMES, Inc. Humenné

Technologies implant: Increasing of the efficiency of a fluidized bed steam boiler coal management optimization with respect to the possibility of maximizing biomass combustion

CO2 save by the measure: 7 500 t CO₂/year

Results: energy savings of 101 689 GJ / year

More information:

Resume of the save energy measure

The project dealt with investment activities aimed at achieving cost savings of primary energy to produce a heat and electricity, mainly by increasing the efficiency of a steam fluidized bed boiler with a rated output of 71.6 MW (coal-firing coal power, increasing the share of installed capacity of biomass combustion to 15.8 MW in this boiler and modernization of energy production and transformation of a media). Implementation of the project: to increase the efficiency of energy carriers and energy conservation in the production process to reduce the adverse environmental impact. The project will deliver energy savings of 101 689 GJ / year.

6. Final recommendation of suitable working models

As a result of this analysis it is possible to underline different promising potential business scheme to be pursued in order to achieve the long term sustainability of the PINE network and model:

1. The services are provided on a mere commercial basis as an ESCO service and three commercial options can be identified:
 - a. The price of the service is fixed (which could be perceived by companies as a lack of committed from the auditors)
 - b. The price of the service is a % of the savings achieved (which makes the income only slightly predictable)
 - c. The price of the service include a small fixed amount and a % of the savings achieved
2. The services offered, and consequently the commercial mode defined above, are combined with some public subsidy that partially cover the cost of the audit. In this case a tax benefit can be more appreciated since these sort of the scheme are more predictable, constant and reliable. Grants depends on a limited amounts of funds and consequently companies could not be able to benefit from them and postpone indefinitely the investment until it is able to win the public funds. It is also paramount to lobby local authorities in order to include in the fiscal benefits not just the investments in energy efficiency but also the energy audit that are the basis for an effective energy efficiency plan.