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on Environment, RES and Energy Efficiency**

***Task Force on Energy Efficiency***

***Assessment of the effects of extending the functioning of Energy  
Efficiency national mechanisms to a supra-national level***

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## Contents

1. Introduction .....	3
2. Scope for enhanced cooperation of EE policies in Mediterranean Countries .....	5
2.1. Energy efficiency trends .....	5
2.2. The experience of the EU supra-national approach .....	6
2.3. Rationale for enhanced cooperation of energy efficiency policies in the Mediterranean context .....	10
3. Comparative analysis of national energy efficiency policies .....	12
3.1. Legal and regulatory measures .....	14
3.2. Energy Audits and advisors .....	16
3.3. Consumers education and information .....	17
3.4. Energy efficiency in public sector .....	20
3.5. Financing tools.....	22
3.6. Market based instruments .....	26
3.7. Voluntary Agreements .....	27
4. Fostering energy efficiency in Mediterranean Countries .....	28
4.1. Recommendation 1: .....	28
4.2. Recommendation 1: .....	29
4.3. Recommendation 3: .....	29
4.4. Recommendation 4: .....	30

## 1. Introduction

Setting out an energy efficiency policy at a supra-national level is a sensitive and complex task. Energy efficiency measures need necessarily to be tailored to the specific context of each country, requiring the direct involvement of local and national bodies. Therefore, any approach aimed at applying the same “recipes” in the different national contexts is clearly not appropriate. On the other hand, this is an area with a large number of players: national and local governments, regulators, industrial agents, consumers. Because of that, it is not straightforward to produce relevant changes in the energy efficiency policy over the long-term. There is not much scope for extending the functioning of Energy Efficiency national mechanisms to a supra-national level. However, an enhanced coordination at the regional level could help to remove some of the existing barriers, as well as to improve the effectiveness of the energy efficiency interventions.

The objective of this document is to verify the scope for enhanced cooperation of energy efficiency policies in Mediterranean countries, to carry out a comparative analysis of national energy approaches to identify existing gaps and areas with a larger potential for energy savings, to provide some recommendations in order to foster energy efficiency in a relatively more effective way.

This document has been developed with the Ad Hoc Group on Environment, RES and energy efficiency of the Mediterranean Working Group on Electricity and Natural Gas Regulation (MEDREG) and it follows two previous deliverables on energy efficiency. A first document, “Pros and Cons of support mechanisms to promote energy efficiency” offered an assessment of energy efficiency policies implemented in Mediterranean countries; the approach followed in the document was both theoretical, to define the scope of individual policies and understand their rationale, and empirical, in order to have an overview of energy efficiency policies implemented in each Mediterranean country. A second document, “Effects of the introduction of successful mechanisms to promote energy efficiency in non-EU countries” intended to verify, from a general perspective, obstacles and conditions that could affect the introduction of successful energy efficiency policies in countries that have not implemented them yet; moreover, three case studies were presented, concerning policies that demonstrated to be successful, in order to provide brief guidelines that could be useful for countries that are planning to introduce similar policies in the future.

The work previously done allowed to gather precious information on existing regulatory approaches in the Mediterranean context and to identify relevant case studies (especially referring to the category of market based instruments) and useful guidelines for the implementation of successful measures.

This report represents a further step in this policy area. It addresses the question on whether a more aligned approach is possible in the energy efficiency field and which possible initiatives can be undertaken to foster energy efficiency in the Mediterranean context.

In particular, chapter 1 focuses on the scope for enhanced cooperation in the context of the Mediterranean basin. On that respect, some energy efficiency indicators have been chosen to facilitate cross-country comparisons; moreover the European experience is presented as it represents the most ambitious attempt to promote energy efficiency on a regional scale.

Chapter 2 is devoted to the comparative analysis of national energy efficiency policies in order to identify existing gaps and areas of intervention where a relatively higher potential for energy saving improvements exists. It reviews the main efficiency policies in place in

Mediterranean countries, grouped by main categories assessing, for each of them, the main bottlenecks and consequent justifications for enhanced cooperation

Chapter 3 provides some recommendations to speed up the implementation of more coordinated and effective strategies for energy efficiency.

## 2. Scope for enhanced cooperation of EE policies in Mediterranean Countries

Looking at Mediterranean countries, energy efficiency policies have reached up to now very different stages of implementation.

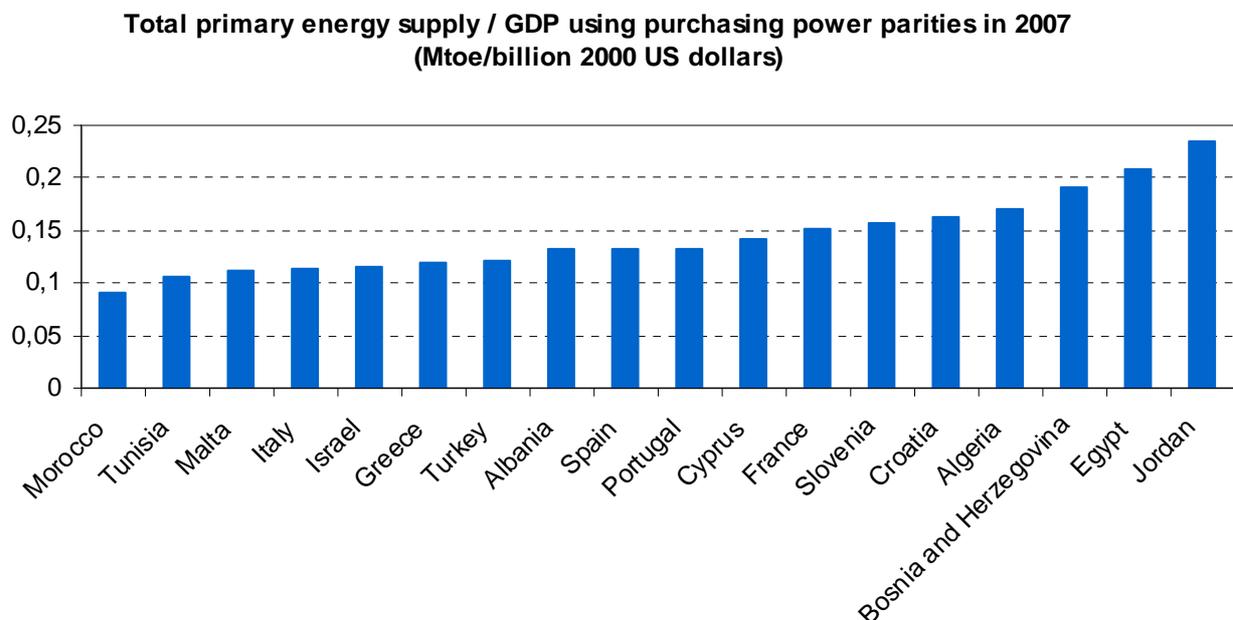
This diversity reflects very different conditions, in terms of economic development, social structure, physical and other specific features of individual countries. Nevertheless, efforts in implementing energy efficiency measures play a crucial role in curbing the energy demand trajectory. Therefore, the dynamics over time of energy efficiency indicators are useful in the evaluation of progress achieved over time and facilitate cross-country comparisons.

### 2.1. Energy efficiency trends

A general indication of energy efficiency performance is given by the the primary energy intensity of economic activities, which relates to the total energy supply of the country to its GDP. A lower primary energy intensity of the economy reflects less pressure on the environment thanks to energy savings obtained when carrying out human activities.

According to IEA data presented in the report “CO<sub>2</sub> Emissions from Fuel Combustion” (2009 Edition) the energy intensity in the Mediterranean area, measured as the quantity of energy (sum of energy production and net imports minus international aviation and marine bunkers and changes in stocks) which is required to generate one unit of GDP (converted at purchasing power parities), varies significantly among MEDREG countries, suggesting that a large potential for energy savings exists, especially in some Eastern and Southern Mediterranean countries (Fig. 1).

**Fig. 1: Energy Efficiency in MEDREG countries, 2007**



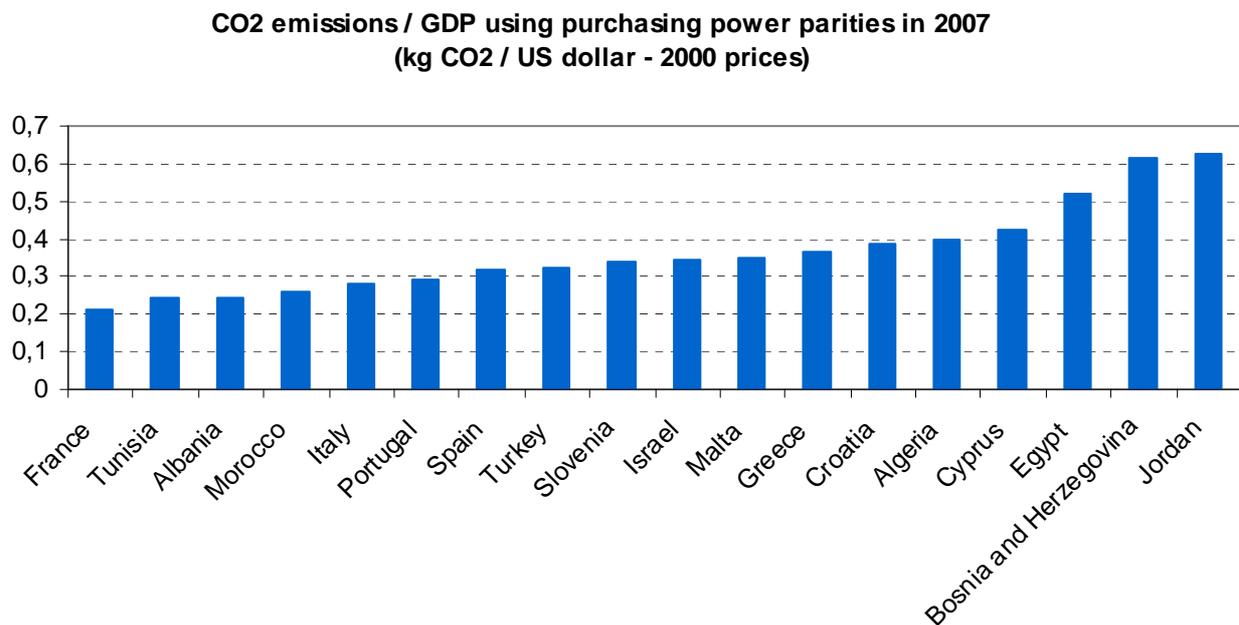
Source: “CO<sub>2</sub> Emissions from Fuel Combustion” (2009 Edition), IEA, Paris

Northern Mediterranean countries (including Greece, Italy, Portugal, Spain) exhibited in 2007 relatively lower levels of energy intensity, as well as Israel, Turkey, Malta, Albania Cyprus. Energy supply per unit of GDP is generally higher in several eastern and southern Mediterranean countries. Relevant exceptions are Morocco and, to a lesser extent, Tunisia, where energy consumption needed for output production is significantly low compared with other countries.

Energy efficiency measures are recognised to be one the most cost-effective ways to reduce GHG emissions. While carbon taxes and emission trading schemes address mainly energy-intensive industries, initiatives to improve energy efficiency can play a crucial role in reducing carbon emission in all other sectors (e.g, buildings, appliances, transport, public sector, etc.) and, therefore, have a significant impact in reducing the carbon intensity of an economy

Fig. 2 shows CO<sub>2</sub> intensity in 2007 (which relates the carbon emissions of the country to its GDP) for most MEDREG countries. Northern Mediterranean countries, including France, Portugal, Italy, Spain, tend to exhibit a relatively lower carbon intensity. Instead, several eastern and southern Mediterranean countries, including Egypt, Algeria, Bosnia and Herzegovina, Jordan, Cyprus, Croatia, show relatively higher levels of CO<sub>2</sub> emissions per unit of output, although in progressive reduction over the past decade. As for energy intensity, Morocco displays a notably low carbon intensity.

**Fig. 2: CO<sub>2</sub> emissions in Mediterranean countries, 2007**



Source: “CO<sub>2</sub> Emissions from Fuel Combustion” (2009 Edition), IEA, Paris

## 2.2. The experience of the EU supra-national approach

The EU supranational approach to energy efficiency represents an interesting case study for the Mediterranean area and offers some justifications for developing a coordinated approach on this field. Countries belonging to the European Union (including some MEDREG Countries like France, Italy, Spain, Portugal, Greece) seem to have partially benefited from

the supranational approach established at the EU level, although some existing barriers have limited its full potential and the possibility to benefit from an alignment of energy efficiency measures has not to be overestimated.

In 2006, the European Union decided that there was scope for an European initiative to enhance the implementation of energy efficiency measures by Member States, in order to better exploit the large energy savings potential in the EU: 19% in industry, 20% in transport, 30% in households and services. Specifically, the EU approach on energy efficiency is carried out around the following 5 pillars:

- The general policy framework and the actions taken under the European Energy Efficiency Action Plan (EEAP);
- The National Energy Efficiency Action Plans (NEEAPs) based on the framework Directive on Energy Services<sup>1</sup>;
- The legal framework for the most important consumption sector – buildings – and energy consuming products;
- Flanking policy instruments such as targeted financing, provision of information and networks like the Covenant of Mayors and Sustainable Energy Europe;
- International collaboration on energy efficiency.

The Action Plan for Energy Efficiency outlines a framework of cost-effective policies and measures and proposes priority actions in order to intensify the efforts of Member States in realising their targets for energy efficiency. The Plan contains over 70 initiatives, covering all relevant sectors, including building, transport and manufacturing.

The Directive on energy end-use and energy services (also called “Energy Services Directive”) was then approved to provide a legal framework for energy efficiency policies to be adopted at national level. In particular, according to the Directive, each member state should have adopted an overall national indicative energy savings target of 9% by 2016 and an intermediate target to be achieved in 2010. In the context of the Energy Services Directive, each Member State was required to submit a National Action Plan describing strategies and measures towards the overall and intermediate national indicative targets.

This Directive complemented other pieces of EU legislation in sectors where an higher potential for energy savings was estimated, including the Energy Performance of Building Directive and the Directives on the energy labelling of appliances, as well as the Directive on eco-design.

In response to its obligations under the Energy Services Directive, the Commission produced a first evaluation (COM(2008) 772) followed by a more detailed assessment of all 27 National Energy Efficiency Action Plans.

The evaluation carried out by the European Commission shows all the complexity in setting out a framework intended at aligning and improving the focus of Member States on energy efficiency. At the same time, the first assessment process provided several lessons from the first implementation period, which can be extremely useful to recast the process and make it more effective.

In general, the evaluation carried out by the European Commission of European energy efficiency policy points out the following main obstacles to energy efficiency improvements:

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<sup>1</sup> Directive 2006/32/EC.

- poor implementation of existing legislation: Member States' implementation of EU legislation at the national level has been relatively slow, fragmented and practical measures insufficient;
- lack of consumers awareness: a behavioural change has not been facilitated by the delays that have characterised the implementation of some measures regarding the information of energy users (e.g. informative billing), labelling and smart metering (e.g. Energy Services Directive requires Member State to ensure the use of metering);
- absence of adequate infrastructures to trigger essential investments in and market uptake of energy efficient building, product and services, also due to lack of information on profitability of energy efficiency interventions.

The definition of an overall and an intermediate national indicative savings target, followed by the set up of NEEAPs, illustrating the national strategies of member states towards those objectives, was intended at intensifying the focus on the implementation of the most effective energy efficiency measures. However, the first assessment has highlighted a considerable gap between the political commitment to energy efficiency and the measures adopted (or planned) and the resources allocated.

This shows how crucial is the way national plans are designed, in order to make them an effective and key policy tool to obtain significant improvements in energy efficiency. Fragmented, stand-alone measures reduce the potential for energy savings, while better results could be achieved by means of coherent packages of policies and measures.

The preliminary experience at the EU level provides some hints that can be useful in the attempt to produce relatively more effective energy strategies, also in view of an enhanced cooperation on a regional scale:

- a coherent and comprehensive strategy towards intermediate and overall targets, backed by institutional and financial provisions is much more effective than a fragmented approach in coping with existing obstacles to energy efficiency improvements;
- good practices in the field of energy efficiency exist; therefore they should play a central role in the design of national strategies; national countries should take advantage of the strong learning potential of good practices and exchange of information; this will result in less heterogeneous approaches in terms of types of measures and policy packages;
- an energy saving potential often exists at the local level; regional and local governments need to be properly involved in the process of elaboration and implementation of energy efficiency measures;
- consumers must be at heart of the energy efficiency policies considering that consumers who are aware of the benefits of energy efficiency are best positioned to produce relevant changes in the use of energy;
- the definition of a strategy for energy efficiency is not enough to produce relevant energy savings improvements; clear responsibilities for implementation need to be allocated; as well, the monitoring activities should be conducted as much as possible by means of measurement principles, energy efficiency indicators, benchmark activities.

In the context of the European Union, a revised energy efficiency action plan is soon expected (beginning of 2011), which will take into account the lessons gathered during the first implementation period. The Action plan is intended to present the new EU legislation on

energy efficiency to achieve the 20% primary energy consumption target. Policy options are still under discussion including a national mandatory energy efficiency target, a binding obligation for member states to implement white certificate systems, a stronger focus on energy efficiency in buildings, as well as the set up of targeted finance schemes (e.g. in the building sector).

In the meantime, the Commission proposed an Energy Efficiency Package (COM(2008)772) to reinforce the key relevant legislation and consisting of the following elements:

- A proposal for a recast of the energy Performance of Building Directive (now Directive 2010/31/EU);
- A proposal for a revision of the Energy Labelling Directive (now Directive 2010/30/EU)
- A proposal for a new Directive containing a labelling scheme for tyres;
- A Commission decision establishing guidelines clarifying the calculation of the amount of electricity from cogeneration;
- A communication on cogeneration.

These pieces of legislation should contribute to the achievement of the EU 20% target by 2020, which previous provisions (as shown in table 1) might only partially reach (about 13% by 2020 if properly implemented by Member States).

**Table 1: Expected annual primary energy saving potential by 2020 for EU27 for some specific energy efficiency measures (full implementation)**

	Measures	Yearly primary energy savings by 2020 compared to “business as usual” scenario in Mtoe	Yearly primary energy savings by 2020 compared with “business as usual” scenario in %	Reference document
1	Energy services Directive 2006/32/EC	Max 193	Max 9.8%	COM(2008)11(as of 2016)
2	Eco-design Dir. 2005/32/EC (appliances) and labelling framework Dir. 92/75/EC	96	4.9%	EuP preparatory studies
	Energy star agreement with USA	2	0.2%	
3	Buildings Directive 2002/91	130	6.6%	SEC(2006)1174
4	Cogeneration Directive 2004/8/EC	23	1.2%	COM(2002)415
5	Fuel efficiency in road vehicles – CO2 cars – public procurement	36	1.9%	COM(2007)856
6	Urban transport – integrated approach	20	1.1%	Policy assessment of the CIVITAS initiative
	<b>TOTAL NET (taking into account the interplay of measures and the witnessed implementation speed)</b>	<b>256</b>	<b>13%</b>	
	<b>OBJECTIVE EU27 IN 2020</b>	<b>394</b>	<b>20%</b>	
	Note: PRIMES model “business as usual” baseline projections (update 2007) in 2020: EU27 TOTAL primary energy consumption = 1968 Mtoe.			

Source: COM(2008) 772 final

### 2.3. Rationale for enhanced cooperation of energy efficiency policies in the Mediterranean context

Energy efficiency measures need necessarily to be tailored to the specific context of each country, requiring the direct involvement of local and national bodies. This applies especially in the context of the Mediterranean area, where countries are characterised by extremely different conditions in terms of economic development, social structure, institutional framework, industrial and financial infrastructures. Therefore, it is reasonable that energy

efficiency programmes should remain a national priority; but at the same time, to maximise the impact of a national program it is essential to work internationally, promoting an alignment towards the existing good practises or a wider coordination process when it is justified.

There exist several types of government programs aimed at improving end-use energy efficiency including:

- Legal and regulatory obligations (e.g. minimum energy performance standards, building energy codes, end-use energy labelling);
- Energy audits and advisors;
- Consumer education and information provision;
- Public procurement programs;
- Financial instruments;
- Market based instruments;
- Voluntary agreements.

A number of benefits are associated with alignment and coordination of energy efficiency policies including:

- **Benefit to regulators and policymakers.** Alignment allows regulators and policymakers in individual economies to avoid costly and time-consuming processes aimed at developing new measures, since they can benefit from adopting well-established good practices and learn from other experiences;
- **Energy savings benefits.** Alignment to good practices and coordination of national policies will increase the effectiveness of developing energy-efficiency programs, thereby providing financial benefits to consumers, and a reduction of the cost of energy supply for the all economy;
- **Benefits to the economic development.** alignment, for example in the field of appliance labels and energy standards can create opportunities for economic development, reducing trade barriers for products in the region. This will gradually favour the availability of more energy-efficient technologies and products.

The scope for enhanced cooperation varies largely according to the category of measures under consideration. For example, regarding the adoption of market based instruments in MEDREG countries, the previous report has found that those measures, although particularly successful for the promotion of energy efficiency, could be premature in the context of developing countries where, instead, it is more appropriate, at a first stage, to introduce energy efficiency obligations placed on energy utilities and move later to more complex systems, requiring more mature financial infrastructures and experienced market players. This consideration highlights the idea that, especially regarding some instruments, the introduction of energy efficiency policies must not be regarded as an objective in itself but it has to eventually follow a careful cost-benefit analysis in the context of the eligible countries.

There are other fields in which cooperation can go much further. This is the case, as already mentioned, of appliance labels and energy standards where a more coordinated approach may have a few number of justifications.

### 3. Comparative analysis of national energy efficiency policies

In Mediterranean countries, energy efficiency policies have reached up to now very different stages of implementation. In the Southern and Eastern Mediterranean area, a relatively small number of countries have set relatively wide packages of measures for energy efficiency, although some of them have recently made important progress in their policy implementation.

Table 2 provides an overview of main efficiency policies in place in MEDREG countries, grouped by main categories.

Some countries have introduced energy efficiency measures in several of the areas in which a significant energy saving potential is estimated, but even larger is the number of countries in which the legislation and the level of implementation is limited to few energy efficiency policy options. Moreover, in some cases, measures established result to be modest compared with the existing large potential of energy savings.

In the public sector, for example, only few countries, including Cyprus, France, Malta, Portugal and Slovenia, have introduced a significant range of measures related to public sector; other countries have no or very weak provisions related to public procurement, although it represents a key area in capturing the potential for energy savings. In 2005, the European Commission<sup>2</sup> estimated that the contribution of public procurement to the EU GDP was about 16%. The importance of public sector it is probably greater in some southern and eastern Mediterranean countries.

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<sup>2</sup> Green Paper on Energy Efficiency, COM(2005)265 final.

**Table 2: Traffic light box**

	Legal and regulatory obligations	Energy audits and advisors	Consumer education and information	Public procurement programs	Financial instruments	Market based instruments	Voluntary agreements
Algeria (DZ)							
Albania (AL)							
Bosnia-Herz. (BA)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Croatia (HR)							
Cyprus (CY)							
Egypt (EG)							
France (FR)							
Greece (GR)							
Israel (IL)							
Italy (IT)							
Jordan (JO)							
Malta (MT)							
Montenegro (ME)							
Morocco (MA)							
Palestine (PS)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Portugal (PT)							
Spain (ES)							
Slovenia (SI)							
Tunisia							
Turkey							

There are already several good practices examples which deserve to be widespread. A coordinated approach, aimed at adopting the good practices available, will allow a better exploitation of the whole potential, enhancing the achievement of long term energy efficiency targets in the most effective way.

### 3.1. Legal and regulatory measures

**Regarding legal and regulatory measures**, northern Mediterranean countries apply a well-established framework legislation promoted at the EU level, mainly through codes and standards in the building and appliances sectors.

For example, in the area of energy efficiency of buildings, Directive 2002/91/EC (strengthened through a recast in 2010) established a common methodology for calculating the integrated energy performance of buildings and minimum standards on the energy performance of new buildings and existing buildings that are subject to major renovation. Besides, it defined a system of Energy efficiency performance certificates for buildings which are constructed, sold or rented out, as well as an obligation for regular inspection of boilers and central air-conditioning systems and an assessment of heating installations in which the boilers are more than 15 years old.

**Therefore, a number of good practices exists that could represent a basis of confrontation to foster a more coordinated approach among countries.** A few good practice examples have been described in the box below.

With regard to appliances sectors, there are several benefits that a more coordinated approach in the region might favour:

- **Reduced trade barriers.** As it was highlighted in the previous report, one problem faced by many Mediterranean countries is related with the difficulties to carry out energy efficiency programmes due to the weaknesses of the economic development and the availability of proper technologies at the industrial level. Definition of harmonised test protocols may result in a reduction of trade barriers for products in the region, since it will be possible to clearly compare the quality and energy performance of appliances across countries and, as a consequence, increase the availability of energy efficiency products in the area. This could gradually promote the introduction of new technologies and the industrial development related to the production of equipments.
- **Energy efficiency benefits.** Alignment of codes and test procedures will probably improve the effectiveness of energy-efficiency programmes, thereby providing economic benefits to consumers and a reduction in generation demand for electricity utilities in the area;
- **Better quality and energy efficiency of appliances.** The quality and the energy performance of appliances in the region may improve by requiring minimum quality and energy efficiency requirements based on agreed codes and standards;
- **Improved expertise and *know how*.** The development of a more coordinated approach may increase the expertise and competence of energy and standards professionals in the region. A regional harmonisation commitment will also intensify the sharing of experience and lesson learned during development and implementation of energy testing and labelling programmes. The exchange of information among different actors will foster the achievement of better results and benefits from the implementation of energy standards and labelling programmes in the region;
- **Convergence to international standards.** The development of a more coordinated approach might represent an opportunity to define technical specifications and codes which are more aligned with accepted international standards. The spillover effects for economic development in the region is potentially large, since it will make easier for Mediterranean countries to access international markets.

### *France*

A fifth thermal building code has been in force since September 2006 applicable to both households and services. This new thermal building code should bring an average incremental energy savings of 15%, compared to the standards that came into force in 2001, which had already effected a 15% improvement in efficiency over the previous regulation of 1989 for dwellings (40% for service sector buildings).

Labels on electrical household appliances have been in place since 1995. Other measures relate to minimum efficiency standards for hot water boilers, refrigerators and freezers, periodic mandatory inspection of boilers and heating/ventilation systems, and limits to the internal temperature of houses or dwellings.

### *Greece*

The country implemented a new innovative measure concerning the subsidised replacement and recycling of old energy intensive domestic air conditioners. It was implemented by the Ministry of Development and is part-financed by the European Regional Development Fund (ERDF) and by National Resources. It took place in the framework of National Strategic Reference Framework (NSRF) 2007-2013, via the Operational Programme "Competitiveness and Entrepreneurship 2007-2013" (EPAN II)17 under the Greek Ministry of Development and the Regional Operational Programs that include Regions of Transient Support. The total budget amounted to 45,000,000 €. The programme took effect on June 5, 2009 and was completed on August 22, 2009. In this period about 134,000 air conditioners were replaced by new, more efficient units with inverters and meeting class A and A++ standards.

The energy saving is estimated in 49.56 GWh/year and the reduction of CO<sub>2</sub> emissions is 43.61 thousands tones/year. The programme was aimed at households and small business consumers using old domestic appliances and air conditioners who wished to replace them. Each consumer could replace up to two appliances with new technology with inverters and high energy efficiency appliances. The subsidy was 35% of the retail price of each new appliance, up to a maximum of 500 € in subsidy. All retired appliances are recycled. The measure was introduced on a state-wide basis.

### *Spain*

In Spain, the minimum energy efficiency requirements for buildings are included in Royal Decree 314/2006 (Technical Building Code) Royal Decree 47/2007 (Building Energy Certification) and Royal Decree 1027/2007 (Regulations on Building Heating Installations - RITE). These regulations are mandatory. Additional improvements are in some case granted through several economic support lines managed by IDAE18 and the Autonomous Regions governments.

In December 2007, the Spanish government announced that it would provide EUR 1 billion worth of subsidies for the refurbishment of existing residential buildings between 2008 and 2012, together with EUR 2 billion in credit for energy efficiency improvements to homes. Additionally, the government said it would provide EUR 200 million for energy efficiency improvements to schools and public buildings in large towns and cities.

The E4 Action Plan 2008-2012 includes actions in relation to residential equipment and office automation, even if the latter does not just relate to the residential sector. As regards the residential sector, it is envisaged that equipment energy efficiency is to be improved by means of the Renove Plan for electrical household appliances, which is intended for the following electrical appliances: fridges, freezers, washing machines and dishwashers.

This measure seeks the annual replacement of 2.5 million electrical appliances with more efficient ones, classes A and B, which is equivalent to a final energy saving of 1,500 ktoe in the period 2008-2012.

The implementation of this measure takes place along with the necessary training, information, and

awareness campaigns addressed to both buyers and sellers. So as to encourage the replacement of electrical appliances, the measure relies on public aid amounting to M€ 523.5, expected to mobilise investments worth M€ 1,992.

### 3.2. Energy Audits and advisors

Energy audits represent a category of energy efficiency measures where a not negligible progress has been achieved in several MEDREG countries. Most countries in the Mediterranean basin have set energy audits schemes on a either mandatory or voluntary basis.

For example, mandatory audits have been established in **Algeria** for the industrial, tertiary and transport sectors, and they require reporting, preparation of action plans as well as the appointment of energy managers. Participation is limited to large operators, specifically those consuming 2.000 toe in the industrial sector, 1.000 toe in transport and 500 toe in the tertiary sector.

In **Tunisia**, compulsory energy audits apply, with a 5 year cycle, to operations consuming more than 1.000 toe in industry and more than 500 in both the tertiary and transport sectors. The Agence Nationale pour la Maitrise de l'Énergie (ANME) appoints expert auditors and provides subsidies covering 20-50% of total expenditure associated with the programme. A voluntary energy audit program is in place in **Egypt** for 200 industrial and commercial facilities. These arrangements also contemplate the training of about 60 engineers.

Regarding energy audits, the way they are designed becomes crucial in order to achieve substantial improvements in energy savings. Audits consists of the verification, monitoring and analysis of energy use, including submission of technical reports containing recommendations for improving energy efficiency, based on a cost-benefit analysis, and an action plan to operatively implement them.

A well defined audit process allows to identify all of the energy streams present in a facility, to quantify energy usage according to its discrete functions and, as a consequence, it facilitates the adoption of appropriate energy efficiency measures, including the reduction of energy consumption, fuel switching, and load management.

Therefore, this is an area where confrontation of good practises and coordination among countries may facilitate further improvement of energy audits procedures. In this perspective, some European countries could share their experience on energy audit schemes with southern and eastern Mediterranean countries.

In that respect, for example, the approach adopted by **Malta** looks interesting, as it relies on the possibility to transfer skills and know-how from the university to the industrial sector to achieve improvements in energy efficiency. In particular, a Cleaner Technology Centre (CTC) was established in February 1993 within the Malta University Services, with the role of advising local industry on introducing cleaner production processes which favour waste minimisation and energy efficiency. The following initiatives have been implemented to enhance energy savings and improve energy efficiency in the industrial sector:

- power factor correction for large scale energy users;
- an energy auditing scheme for major industrial activities (production processes);
- eco-contribution as a disincentive to minimise waste (industrial, commercial and domestic sectors).

Good examples exist also in other countries. They are traditionally directed to the industrial sector but, in few cases, they have been extended to other sectors. This is the case, for example, of **France**, where an energy performance assessment (DPE in French) applies to households and buildings.

Mandatory since 2006, the DPE is conducted by professionals who quantify the estimated consumption of energy of the residences and buildings. Compliance with this programme is compulsory for the sale of residential and tertiary buildings and since July 2007, for buildings offered for leasing.

### 3.3. Consumers education and information

Consumer awareness and information on energy savings opportunities are key factors in a strategy aimed at achieving significant energy efficiency improvements. The set of available tools to promote consumer education and information in the energy efficiency field range from regulation of billing and information provided to consumers regarding their energy consumption, smart metering programmes, information campaign and other initiative to enhance a behavioural change in the way consumers use energy.

This is an area where a large potential for energy savings exists. As table 2 shows, several countries have adopted some initiatives in this area. However, they look very heterogeneous and only few countries seem to be moving to a more comprehensive package of measures

In most southern and eastern Mediterranean countries, no specific regulation of billing exists and no special information that enables customers to understand and reduce their own consumption is provided in bills (like, for example, the level of consumption articulated among different aggregations of hours, or the distributor's energy mix and the related environmental impact).

However, some countries have decided to start using energy billing to inform consumers about energy savings opportunities. In **Egypt**, for example, a marketing campaign through electricity bills has been carried out to encourage consumers to use fluo-compact light bulbs (FCL).

The Electricity Regulatory Commission of **Jordan**, in the context of the preliminary introduction of a time-of-use pricing regime, plans to encourage consumers to progressively reduce electricity consumption and adopt a more responsible behaviour by providing them with two bills. The first bill will show the energy expenditure based on a flat tariff while the second one showing the alternative cost of energy based on a time-of-use tariff.

In the context of the initiatives to inform consumers about existing opportunities to save energy, in several countries public institutions, both national or international, as well as energy utilities and other organisations carry out communication campaigns and programmes to educate the consumers about what they can do to promote a better use of energy.

In **Algeria**, for example, awareness and information campaigns are frequently organised by APRUE, and addressed to the public through the media. During the last four years, APRUE has also organised an "Open Doors on Energy Conservation in Schools" project, whose aim is to raise awareness of young students about the importance of energy conservation.

In **Egypt**, an information dissemination program on energy efficiency and greenhouse gases reduction is in place, partially financed by the Egyptian Electricity Holding Company (EEHC) and the United Nations Development Programme (UNDP).

This is also an area of policy making where cooperation and exchange of good practices could be beneficial for the development of more effective strategies to achieve energy efficiency goals. In Europe, action at Community level represented an incentive to introduce a wide range of information measures.

The Directive 2006/32/EC on energy end-use efficiency and energy services includes rules regarding the dissemination of information to the relevant actors on energy efficiency mechanisms.

Moreover, the European Community has launched a number of trans-national projects to facilitate the sharing of experiences in energy efficiency programmes among its members (e.g. the BESS and expanding BESS projects, within the Intelligent Energy Europe – EIE Programme, aimed at developing and promoting benchmarking and energy management approaches in order to improve energy efficiency in industrial SMEs with particular focus on the food and drink industry). This project was built upon the Norwegian benchmarking system and is being extended across Europe.

Under the European framework, Member States have taken several information initiatives such as advertising campaigns, educational materials and initiatives, advice on how to save energy, and web-based energy savings tools. Some information measures target the general public, while others target professional stakeholders (e.g. energy managers, architects and building sector professionals) or civil servants.

In order to provide more transparency and information for consumers, tracking systems for renewable electricity have the function of proving to a final customer that a given share or quantity of energy was produced from renewable sources. One of these systems is based on the so called “guarantee of origin”, an electronic document which provide this proof to final consumers.

Some of those initiatives could offer useful hints and lesson to countries which are currently considering how to develop information initiatives.

#### *The BESS and expanding BESS projects*

In 2005 the BESS project was launched within the Intelligent Energy Europe to further develop and promote the widespread application of benchmarking and energy management in order to improve energy efficiency in industrial SMEs, with particular focus on the food and drink industry. The project had a duration of 28 months and it involved 11 countries. A further objective is the development of a sustainable approach to application of innovative solutions, thereby insuring the continued relevance of energy efficiency and energy management to SMEs.

In order to achieve its goals, the project focused on:

- development of an interactive tool to promote a systematic and persistent approach to energy management and benchmarking (jointly with sector associations). The tool consists of: an energy management implementation model and standards for adoption of energy management measures covering selection of appropriate measure, implementation and day-to-day management; an e-learning scheme; a monitoring and benchmarking system for the food & drink industry;
- execution of pilots in 45-65 SMEs. Each pilot acted as a data collection point and as a testing environment for the interactive tool;
- comparative analysis of energy monitoring and benchmarking in 11 pilot countries;
- targeted dissemination of the interactive tool with support from the food & drink associations.

This activity will also address the issue of barriers relating to the dissemination of information and training at a local level, including the language issue;

- project management.

In 2007 an expanding BESS (exBESS) project was launched in order to extend the BESS results to 8 additional countries (including Italy, Belgium, Portugal and 5 new EU member States: Slovakia, Czech Republic, Poland, Latvia and Romania), new industrial SME sectors in and beyond the food and drink industry, including textile/carpet, machinery, crafts, etc. Moreover, the project is intended to consider the Introduction of financial mechanisms to boost energy efficiency investments as a result of active involvement of ESCOs in the participating countries.

#### *The French sustainable building training scheme*

A sustainable building training scheme was designed in France with the participation of the French sectoral organisations (FFB, CAPEB, FNSCOP) and ) and a few obliged actors (so far mainly EDF), under the control of the French Ministry for Environment and Sustainable Development and Planning (MEDAD) and of the French Agency for Environment and Energy Management (ADEME). The programme started in January 2008 and it is based on a common platform encompassing 3 modules:

1. General knowledge about building and climate change, and buildings as energy systems;
2. Conceptual and software tools to make a global energetic refurbishing offer;
3. Nine specialised modules about how to properly implement effective energy efficiency solutions in the renovation of buildings (insulation, solar hot water...).

The training organisations that are addressing modules 1 and 2 were selected through a public offering in 2007; those for module 3 are currently being selected.

It is expected that 50,000 workers in the building industry will have been trained through this programme by mid-2009.

#### *Portugal Training Academy*

Since 2008, ERSE has been promoting a Training Academy aimed at developing an informed and enlightened public awareness of energy matters. ERSE has been conducting workshops open to the public on PPEC (see section 5.4 Tenders), and has developed an extranet for the energy consumer with relevant information relating to end-user energy efficiency. For example, it provides tips on how to save energy. In addition, ERSE is currently developing a project specially targeted at energy education in schools.

An effective tool to promote a change in energy consumption behaviour and to increase consumers awareness on energy savings opportunities is represented by the **smart metering**. Through smart meters customers are able to monitor the exact amount of energy used in peak and off-peak hours and, as a consequence, to be in the position to change their consumption behaviour in case they want to reduce their energy bill.

A number of MEDREG countries are considering the gradual replacement of old meters with electronic versions for energy efficiency purposes. In **Egypt**, for example, a feasibility study has been carried out for the introduction of smart meters on a large scale, and a pilot project has been implemented, involving the installation of about 20,000 electronic meters.

In **Jordan** the Electricity Regulatory Commission (ERC) has taken significant steps to reform the electricity tariff through the introduction in 2008 of a time-of-use tariff. This is a three part tariff available to many consumers' categories such as new medium agricultural and commercial consumers, as well as for consumers whose load is greater than 200 kW. In the

near future ERC plans to apply a two part tariff to residential consumers and other consumers, as soon as electronic meters are installed. Since 2008 all the new procurements are for electronic devices. At the same time, ERC has started a campaign to increase public awareness regarding the time-of-use tariff and the appropriate consumer behaviours to achieve the saving goals.

In Europe actual implementation of smart meter policies differ quite widely, as a consequence of differences in legal frameworks and powers of regulators. However, a growing number of Member States are in the process of drafting policies or are at least planning to do so.

The experience of countries that have almost completed a roll-out programme can be particularly useful for those countries that are in the process of discussing the replacement of old meters with electronic versions, in order to avoid mistakes and implement available good practices. In that respect, the previous report recommended, for example, to introduce interoperable meters from the beginning, complying with minimum functional requirements, this allowing the possibility for consumers to switch from one supplier to another when markets become relatively more mature and competitive

In Italy, a nationwide roll-out plan regarding 95% of all meters installed is almost complete. More than 33 million of intelligent electricity meters are working, while the rest (more than 1.5 million) are going to be installed by the end of 2011.

In Spain is currently on development a substitution plan to change all metering devices for electric energy. New smart metering system will be fully working for all consumers by 2018

### **3.4. Energy efficiency in public sector**

Although public sector represents an area with large opportunities for energy savings, only few countries have introduced substantial measures to exploit its full potential.

At the European level, the EU legislation has certainly helped to intensify efforts in this key sector. The European Directive on energy end-use efficiency and energy services (Directive 2006/32/EC) includes provisions on the exemplary role of the public sector. In addition, the European Commission issued in 2008 a communication on the potential benefits of green public procurement. Several EU countries are therefore trying to comply with these provisions introducing good public sector measures. A number of countries have already adopted or are establishing energy efficiency procurement criteria; some of them have also adopted concrete procurement targets.

Although there is no much scope for alignment energy efficiency programmes for public sector among MEDREG countries, this is an area where cooperation and sharing of good practices could be very beneficial to achieve energy savings targets.

The following box briefly presents initiatives taken in some countries aimed at improving energy efficiency standards in the public sector.

#### *Greece*

Since 2008, a new regulation has been introduced by the Ministry of Development for lighting, ventilation, heating, cooling, power factor correction and load balancing which applies to buildings in

the public and wider public sectors, and which includes several energy efficiency provisions. Concisely, the decision includes measures relating to:

- obligatory connection to the natural gas distribution network, where possible;
- power factor correction and load balancing;
- preventative, regular maintenance of air-conditioning equipment;
- observation of various CEN standards for the determination of the desirable and allowed indoor temperatures, the required quantity of fresh air, as well as the levels of adequate lighting depending on the room space;
- replacement of bulbs with more energy efficient examples(class A or A+);
- installation of Building Automation Systems (where they do not exist);
- use of suitable chill paints.

At the local level, the Ministry of Development recently issued a new program named “EXIKONOMO” (SAVE) for municipalities with more than 10,000 citizens. Actions are categorised in five areas, as follows:

- projects for energy efficiency improvement in existing buildings, implementation of technological measures in various categories of municipal buildings such as Town Halls, municipal services buildings, cultural centres, schools, multi-sports and training centres, special buildings etc;
- projects concerning reconstruction of roads, squares, parks and other public areas;
- pilot actions in public urban transport;
- technical interventions in other specific urban infrastructures with low cost investments for the improvement of energy efficiency, for instance in pump plants, biological waste treatment plants etc;
- information dissemination activities to raise public awareness, energy monitoring.

Each approved project will be financed up to 70% of its total budget. The municipality will pay the remainder during the period (2009-2012).

#### *Portugal*

Portugal aims for 50% of its public tenders to be based on environmental criteria in the context of measures for energy efficiency and decentralised production of energy by 2010.

Portugal indicates that from 2010 vehicles are to be acquired subject to existing short lists of efficient vehicles with an emissions index of less than 110g/km with the intention to phase out vehicles with CO<sub>2</sub> emissions in excess of 200g/km by 2015. Portugal further introduces procurement measures that target efficient lighting, office equipment and equipment and materials used in the design and construction of public works.

Portugal aims at having 20% of state buildings be class B or higher and aims for all public pools and changing rooms to have solar thermal installations, to have renewables installations in half of its schools and cogeneration installations in a quarter of the hospitals.

#### *Spain*

In Spain there are specific initiatives in Public Sector, in the “Spain's Energy Saving and Efficiency Strategy (E4):2004-2012”. Most important working subjects are:

1. Street lighting installations. Regulation on the energy efficiency of outdoor lighting systems. Changing lighting units and bulbs/tubes. Investment aid.

2. Energy efficiency studies and audits on installations belonging to local authorities and public companies.
3. Energy training courses for municipal technicians
4. Improving the energy efficiency of facilities for the supply and purification of water.

In the new “Sustainable economy Act, 2011” one of the targets for public sector is to reach 20% of saving energy by 2016 from as “business as usual” scenario.

#### *France*

With regard to new and existing public buildings, France sets energy performance requirements for full or partial renovation or construction of public buildings, together with optimisation of heating equipment. In addition, the French NEEAP indicates that buildings and public facilities will comply with low-energy or positive energy standards from 2010 and envisages thermal renovation of public buildings within the next 5 years.

The French NEEAP refers to ambitious targets in its National Action Plan for Sustainable Public Procurement. When renewing its fleet the state and certain public sector entities should acquire or use a minimum proportion of 20% electric, NGV or LPG vehicles under 3.5 tonnes, if they have a fleet of more than 20 vehicles.

### **3.5. Financing tools**

Regarding financial tools, the range of possible measures is wide and the analysis of national policies shows that several innovative financing schemes are available. Therefore, there is scope for intensifying exchange of experience and the focus on good practices.

Among southern and eastern Mediterranean Countries, some have already established relatively precise programs to provide funds, grants or subsidies to parties implementing energy efficiency projects.

**Egypt**, for example, has designed two financial measures to promote energy efficiency in the context of its Energy Efficiency Improvement & Greenhouse Gas Reduction (EEIGGR) Project.

The Loan Guarantee Program offers soft loans to ESCOs to promote the adoption of energy efficiency technologies. An agreement has been signed between the Egyptian Electricity Holding Company and the Credit Guarantee Company to provide financial guarantees to an approved list of projects. The Small Grants Program assists seven NGOs in financing energy efficiency lighting programs.

An innovative financing mechanism to promote energy savings was also established in **Tunisia** through the Fond National de Maîtrise de l’Energie (FNME) which allows to subsidise 20 % of all investments in energy efficiency undertaken by corporations; 50 % of energy audit costs; 20 % of all solar energy investments; 50 % of investments in demonstration initiatives promoting renewable sources and energy efficiency. In the residential sector a successful policy has been carried out to boost solar water heating. The PROSOL project started in 2005 and worked through an innovative mechanism combining investment subsidies and interest rebates, with loans from the banking sector.

In **Algeria**, a National Fund for Energy Conservation (FNME) was established in 2000, financed by duties levied on major consumers of conventional energy, to support renewable energy and energy efficiency projects, particularly under the framework of the National

Program of Energy Conservation (PNME). All sectors are eligible for subsidies.

Algeria is also committed to the promotion of energy efficiency in the residential sector. The ECO-Lighting Program, coordinated by the Government Agency for Energy Conservation (APRUE), was established in 2008 and it provides a 50% subsidy on the price of fluo-compact lightbulbs (FCL) to enhance the replacement of the less efficient incandescent lightbulbs. The Government hopes to increase the subsidy to facilitate the purchase of efficient lightbulbs, in pursuit of its target of having five million FCL installed in the residential sector. Further, in the context of the National Program for Energy Management (PNME), a pilot project has been established to build 600 homes with High Energy Performance.

With respect to financing tools, the experience at the EU level is significant both for number and range of implemented financial measures, targeting all end-users sectors (including existing and new buildings, appliances, heating/cooling, lighting, transport, industry) by mean of both traditional or more innovative schemes. The following matrix provides an overview of the financial measures introduced in the European countries, grouped by end-user sector and type of tool.

**Table 3**

Type of measure End-user sector	Grants and subsidies	Soft Loans	Taxes and Tax incentives
Existing buildings	Austria, Cyprus, Finland, Luxembourg, Poland, Slovenia	Belium, France, Germany, Greece, Portugal, Slovak. Rep., Slovenia and UK	Austria, Belgium, Finland, France, Greece, Italy, Netherlands, Portugal, Romania, Spain, UK
New buildings (passive or low energy houses)	Austria, Belgium, Czech Rep., Ireland, Luxembourg, Slovenia, UK	Germany, France	France
Appliances, heating, cooling and lighting	Austria, Belgium, Germany, Hungary, Luxembourg, Malta, Portugal, Romania, Slovak Rep., Slovenia, Spain		Austria, Cyprus, France, Germany, Ireland, Italy, Portugal, Slovenia, Spain
Transport			Belgium, Cyprus, France, Greece, Hungary, Ireland, Latvia, Luxembourg, Malta, Netherlands, Portugal, Slovak Rep., Spain, Sweden, UK
Industry			Portugal, Slovenia, Sweden, UK

## France

In France various forms of soft loans and tax incentives are in place for building refurbishment. In 2009 measures were also introduced to provide financial support to new buildings.

The country has had innovative financing products for the residential sector since 2007, when in partnership with banks, low-interest loans for residential energy conservation projects were offered and financed through a tax-free savings account. The low-interest loans are based on a previous tax-free savings account known as the CODEVI (Compte pour le Développement Industriel).

This savings product allowed banks to finance the development of small- and medium-sized enterprises (SMEs). The CODEVI as of 1 January 2007 has been renamed the LDD (Livret de Développement Durable), and banks must use a portion of these funds to offer preferential loans for domestic energy conservation projects. While the CODEVI was capped at EUR 4600 per person, the LDD cap has been raised to EUR 6000 per person to raise additional funds for these loans. As of 2009 the account pays tax-free interest of 2.5% a year. In 2008, banks had to dedicate 2% of the funds to energy conservation loans, rising to 5% in 2009 and 10% thereafter. Preferential loans can be awarded to individuals, co-properties and entrepreneurs for the purchase and installation of: energy efficient boilers; thermal insulation (walls, windows, shutters); thermal regulation equipment; equipment producing energy from renewable sources; space and water heating equipment using wood or other biomass; heat pumps.

Applicants must provide the bank with documents from the equipment installer, certifying that the equipment and installation meets the required energy efficiency criteria. This financial measure is complementary to the 2005 tax credit scheme. The acquisition of domestic energy efficient equipment entitles the buyer to a price reduction (tax credit scheme) and a low-interest loan at the same time (LDD measure).

The 2005 tax credit scheme was extended to 31 December 2012 (from end of 2009). To be eligible for the tax credits the building in which the equipment is used must be a primary residence and at least two years old; for renewable energy equipment the building can be new or old. The tax credits are as follows:

- 5% for purchases of low-temperature boilers (until 31 December 2008);
- 25% for purchases of condensation boilers, thermal insulation and heating regulation devices.

This amount increases to 40% if: a) the material and equipment is installed in a home constructed both before 1 January 1977 and this installation occurs before the 31 December of the second year of the home's acquisition by its present owners; b) the material was purchased after 1 January 2006.

Since 2009, the installation costs for thermal insulation of walls, floors, roofs and ceilings are also covered by the tax credit:

- 40% for energy production equipment using renewable energy and heat pumps devoted primarily to heat production; Increased to 50% for renewable energy used for heating as of 1 January 2006. However the credit for heat pumps decreases to 40% in 2009 and 25% in 2010 for biomass or wood boilers, and heat pumps. It remains at 40% if the material and equipment is installed in a home constructed both before 1 January 1977 and that this installation occurs before the 31 December of the second year of the home's acquisition by its present owners. Air-air heat pumps are excluded as of 1 January 2009;
- 50% for obtaining an energy audit, when not required by law (as of 1 January 2009, limited to one audit every 5 years);
- 25% for the purchase of equipment and heating systems drawing the majority of their power

from cogeneration or renewable energy sources (as of 1 January 2006);

The tax credit is limited to EUR 8000 per person, EUR 16 000 for a couple and EUR 400 for each additional dependent. Besides, the 2009 Finance Law contains various provisions to increase financing for energy efficiency investments:

- Zero-interest loans for house purchase; it's a programme for those purchasing a home for the first time (either new or existing construction); the loan amount is increased by EUR 20 000 if the building meets standards beyond those required under current building regulations. In general, this covers low-energy or positive-energy buildings (known respectively as BBC - bâtiments basse consommation, and BEPOS – bâtiments à énergie positive);
- Eco (or green) -loan for renovation activities: it's a 0% loan for energy-efficient renovation; the aim is for energy savings to allow repayment of the loan. Activities that can be covered under the loan include: thermal insulation for roofs, exterior walls, and exterior glass surfaces; installation, regulation or replacement of heating or hot water systems; installation of heating or hot water systems using renewable energy. The loan amount is limited to EUR 30 000. Therefore, the Minister of environment signed on February 26 2009 with banks, building and real estate professionals, and ADEME (French Energy and Environment Management agency), an agreement detailing the practical implementation of the green loan or eco. The beneficiaries, without any condition of resources, are occupying owners or non occupying owners. The buildings concerned must have been completed before January 1, 1990 and a household can only have one green loan.

#### *Italy*

Italy provides numerous large tax incentives for building refurbishment, including replacement of building equipment through an income tax deduction corresponding to up to 55% of the investment cost. On the basis of preliminary data in the period 2007-2009 around 600,000 initiatives were implemented for total investment costs (prior to tax deduction) of 8 billion euros which resulted in energy savings for 4.4 TWh.

#### *Portugal*

The Portuguese National Energy Efficiency Action Plan comprises a set of measures aiming at an increase in energy efficiency equivalent to about 10% of the final energy consumption by 2015. More recently, in November 2009, the EU Energy Services Directive was transposed into national law establishing energy savings goals of 9% up to 2016.

The Plan includes a few innovative financing measures:

- Encouraging reduced electricity consumption - providing an incentive for major consumers to reduce consumption - by providing bonuses to those who consume less, and establishing an Energy Efficiency Fund;
- Efficiency cheque: providing an "efficiency cheque" for two years, worth 10% or 20% of annual electricity costs to consumers with verified energy reductions of, respectively, 10% or 20% following investments in energy efficiency;
- A reduction of 2.5% in the electricity tariff to those with lower energy consumption, and creating pricing schemes in favour of efficiency.

The creation of a subsidised low-interest personal line of credit, in the amount of EUR 250 million per year, for investments in energy efficiency measures, with an emphasis on urban rehabilitation. Interest rate reduction of 4% provided for credit, up to 8% without guarantees.

#### *Spain*

As part of Spain's "Plan E" economic stimulus package, and in line with Spain's 2008-12 tourism plan

which seeks to establish a competitive and sustainable tourism sector by 2020, the Renove Tourism Plan aims to help rebuild Spain's tourism sector along more sustainable lines. The Plan offers low-interest loans in partnership with Spain's Official Credit Institute (ICO) for tourism sector companies to undertake renovation and improvement, including measures that improve energy savings or the implementation of environmental quality management systems. Up to 90% of investment costs will be financed, to a maximum of EUR 1 million (varies according to amortisation period chosen), and with a fixed interest rate of 1.5%. In February 2009, the initial EUR 400 million earmarked for the plan was exhausted, and an additional EUR 600 million allocated.

### 3.6. Market based instruments

According to the analysis carried out in previous reports, market based instruments, including white certificates schemes, tender mechanisms and time based pricing, are among the most efficient tools to promote substantial achievements in terms of energy savings.

The introduction of a white certificate market in Italy and in France demonstrated to be effective in the promotion of energy savings. The Italian Regulatory Authority for Electricity and Gas (AEEG) has recently informed (September 2010) that the Italian mechanism allowed, over the past 5 years, a cumulative reduction in energy consumption corresponding to 6.7 Mtoe and avoided CO<sub>2</sub> emissions equal to 18 Million tons. These results are higher than the national targets over the period 2005-2009 and correspond to the electricity generation of a new 750 MW power plant or, equivalently, to the annual electricity consumption of a town with 1.8 million inhabitants.

Similarly, a tender mechanism for the selection of most efficient demand side management measures showed to be successful in achieving energy savings targets. Such an approach was successfully implemented in Portugal; measures submitted by eligible promoters are analysed and approved by means of a competitive process and ranked according to pre-established rules, based on a cost-benefit analysis.

Enhanced cooperation in the area of market based instruments requires to be carefully evaluated. On the basis of the analysis on previous reports, we found that those measures, although particularly successful for the promotion of energy efficiency, could be premature in the context of some MEDREG countries. The analysis suggested instead a gradual approach, starting from the introduction of energy efficiency obligations placed on energy utilities and to move only later to more advanced systems, when more mature financial infrastructures and experienced market players exist.

The analysis of available good practices, even the most advanced ones, can be useful for countries which are planning to design new energy efficiency measures like, for example, energy saving obligations for market actors (namely retail energy suppliers and distributors). Details on successful schemes are available on the previous report on "Effects of the introduction of successful mechanisms to promote energy efficiency in non-EU countries".

Regarding Load Response programs, they are not very common in most southern and eastern Mediterranean countries, although some interesting initiatives are emerging. In Egypt, one load shedding agreement for 160 MW is in place between the TSO and a large fertiliser company. Moreover, the Egyptian regulatory authority is preparing a regulatory framework for interruptible contracts, including rules for load shifting, peak sharing, planning of regular and annual maintenance.

In this area an alignment among national initiatives should be oriented by lessons coming

from implemented measures and through confrontation and exchange of information on the good practices available. The most widespread Demand Response measures in Europe include services of load interruptibility (e.g. France, Ireland, Italy) and time-of-use (TOU) tariffs (e.g. Italy, Portugal). Smart Meter roll-out policies in many countries are aimed at providing suppliers with the possibility of developing new tariff models which better reflect consumption behaviour, and which provide information on the relevant system consumption peak.

In France, large consumers who contract for interruptible supply can be disconnected when the system becomes overloaded. Since 2008, the French balancing market has also been experiencing a new kind of demand response: aggregators may combine small reductions of consumption at sites connected to the public distribution and transmission grids.

In Portugal and Spain a demand-side bidding is operational in the context of the Iberian electricity pool. The system operator provides an interruptible regime which offers interruptible tariff to large consumers which are technically able to reduce demand. This results in an economic saving for the consumer and helps to alleviate electricity demand at peak times. Additionally, ERSE (the Portuguese Energy Regulator) sets time-based tariffs in order to incorporate into prices the costs of producing energy in different time periods, hence encouraging timely efficiency consumption patterns in end-users.

### **3.7. Voluntary Agreements**

Voluntary agreements are commitments to improve energy efficiency or reduce usage undertaken by market players, power producers or industries, in consultation or negotiation with a public authority, and usually recognised by that agency. Such commitments are supposed to deliver Government policy objectives faster or more cost-effectively than mandatory requirements.

Voluntary agreements usually work better in a context where economic and social actors are used to achieve goals by voluntary actions instead of enforcement through mandatory requirements. Even though voluntary agreements can take different forms, most of them are between policy makers and industry. They can consist of the fixing of a non-binding target for energy efficiency improvements or emission limits, and can be introduced in exchange for regulatory forbearance.

Voluntary agreements can present advantages compared with regulation. They can provide for quick progress due to rapid and cost-effective implementation. They allow for flexible and adjusted adaptation to technological options and market sensitivities.

A part from national initiatives in the field of voluntary agreements, the European context offers also some interesting example of commitments at a more supranational level, mainly by the conclusion of voluntary agreements involving, for example, European industrial associations. At the EU level, self commitments to get a reduction in energy consumption have been achieved in several sectors by Associations representing European manufactures like, for example, CECED (The European Committee of Manufacturers of Domestic Equipment - mainly refrigerators and freezers), EICTA (European Information, Communications and Consumer Electronics Technology Industry Association) and CECED (The European Committee of Manufacturers of Domestic Equipment (CECED – domestic washing machines).

## 4. Fostering energy efficiency in Mediterranean Countries

This report provides an overview of the rationale for coordinating policy interventions on energy efficiency in the MEDREG context. In particular it reviews the main efficiency policies in place in Mediterranean countries, grouped by main categories and assessing, for each of them, the main bottlenecks and consequent justifications for enhanced cooperation.

In the energy efficiency field, some relevant experiences of regional harmonization already exist. In that respect, the EU case is probably the most advanced, based on a relatively comprehensive top-down approach of deep integration fostered by supranational institutions and availability of regional funds. In Asia, a more bottom-up cooperation is in place on energy efficiency issues, which relies on competitive firms and progressive financial and market integrations.

In MEDREG area, in the absence of the top-down institutional arrangements as in Europe or the bottom-up integrated production networks in Asia, an effective policy coordination mechanism requires initiative and leadership at the highest executive level.

The development of a more integrated approach on energy efficiency would reduce implementation costs and promote cross-border knowledge transfer, as well as take benefit from positive externalities which are not exploited when fragmented measures are implemented. However, the attempt for deeper cooperation in energy efficiency field requires to be carefully evaluated since the diversity of Mediterranean countries in terms of energy situations renders inappropriate any approach aimed at applying the same “recipes” in the different national contexts.

The lesson provided by the European experience and by the first implementation of National Action Plans on energy efficiency suggests that a more holistic approach, based on the balance between different types of intervention is more effective than focusing on individual measures.

Therefore in order to foster energy efficiency and international cooperation among Mediterranean countries, we formulate the following recommendations:

### 4.1. Recommendation 1:

*Starting from a status quo evaluation, prepare future national strategies for energy efficiency in order to achieve improvements where there is more potential for energy savings.*

The analysis carried out in this report shows that although several countries have introduced energy efficiency measures in several of the areas in which a significant energy saving potential is estimated, even larger is the number of countries in which the legislation and the level of implementation is limited to few energy efficiency policy options.

Countries should take into account the fact that there is room to achieve relevant improvements in terms of energy savings and design future national strategies in order to fill the identified gaps with legislation and initiatives for energy efficiency. For example, residential electricity consumption is one of the fastest growing areas of energy use, especially in developing countries. Therefore, the adoption of effective building codes or a strong encouragement to the installation of more advanced lighting should become a priority. In that respect, the experience achieved at the EU level (not least the provisions of the new

European Directive 2010/31/EU) can be particularly useful in the design of national policies.

In the appliance sector as well, there is much scope for a focus of future national strategies aimed at defining, for example, minimum standards to be adopted for specific equipment classes and aimed at improving and standardising product labelling in order to allow consumer to make more informed decisions. Coordinated initiatives in this area may result beneficial and speed up the economic development; they will lead to the development of regional markets, facilitating the availability of new technologies and the penetration of more energy efficient products.

#### **4.2. Recommendation 1:**

***Establish a partnership to provide technical assistance in the design of national plans/strategies***

As the European experience teaches, the elaboration of a comprehensive and balanced strategy for energy efficiency is not an easy task. The first evaluation carried out by the European Commission on the National Energy Efficiency Action Plans shows that several countries have proposed fragmented, stand-alone measures instead of a coherent packages of policies and measures. However, the full process provides a strong learning potential to improve future strategies. Numerous good practices have been identified as well hints emerged on how to improve the design and make more effective the implementation of energy efficiency packages.

This experience might be extremely useful for those Mediterranean countries which are interested in developing a more comprehensive strategy for energy efficiency. A partnership involving relatively more experienced countries and countries with little experience with such approach, aimed at providing them with technical assistance in its design, might be of help to improve the general quality of national strategies and achieve better results in phase of implementation.

#### **4.3. Recommendation 3:**

***Monitor results, share experiences and lessons, agree on good practices and use them as a guide for future action***

Once a country has set up its own national strategy for energy efficiency, it becomes crucial to monitor results that are progressively achieved. This offers a great opportunity to verify that energy efficiency measures are implemented on time and in a proper way, as well as it offers a great opportunity to verify the existence of problems which slow the all process and eventually adjust the strategy in order to minimize them.

One important lesson coming from the first implementation of NEEAP in Europe is the relevance of the monitoring process. This is why the European Commission is working to refine harmonized measurement principles, energy efficiency indicators and benchmarks which will in turn use to assess the second and third NEEAPs.

A practical and preliminary way to observe results and use them to improve the effectiveness of future action would be simply to report them on time and share with other Countries progresses achieved and lessons that the implementation of measures can provide. This would

help to agree on good practices available and move towards more coordinated policies for achieving energy efficiency improvements.

#### **4.4. Recommendation 4:**

##### ***Reduce the financial barriers to scale up the potential of energy savings interventions***

Financial barriers represent major impediments to the adoption of effective energy efficiency investments, especially in the context of developing countries, where the availability of financial resources is relatively scarce.

One response to the problem, as already mentioned, refers to the involvement of the private and industrial sector in the promotion of more energy efficient technologies. The alignment and coordination of energy efficiency policies on a regional level, as for example in the field of standard harmonization, would create economies of scale, reduce costs and therefore create more opportunities for the private sector to contribute to the achievement of energy saving targets.

Moreover, regional cooperation is needed to facilitate the role of multilateral and regional financial institutions which already operate in many Mediterranean countries. These international organisations are best positioned to support concerted policy approaches and interventions since they are able to mobilize large scale financial resources.