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EFFECT

Upgrading of Energy Efficiency Public Procurement

for a balanced economic growth of SEE area

DAFNI
Network of Aegean
Sustainable Islands

NORTH AEGEAN REGION

ΚΑΠΕ CRES

ENERGY EFFICIENT PUBLIC PROCUREMENT

GUIDELINES

Based on products and results of the EFFECT Project

with the contribution of representatives from national and local authorities

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1. PART 1: GENERAL GUIDELINES

1.1 Introduction

The present document constitutes a deliverable of the EFFECT Project in the framework of the European Programme "South East Europe". The document aims to provide support to the competent decision makers as to the execution of tenders and contracts and to facilitate their work, by providing the essential information required for that purpose.

The document refers to the European and National framework for Energy Efficient Public Procurement (EEPP), the principles, rules and guidelines that may be used, in order that Public Procurement for works, supplies and services ensure the maximum possible energy saving. Furthermore, it refers to special criteria applicable in four indicative sectors, in order to attain the aforementioned objective.

The document has been drawn up thanks to the joint efforts of the Focus Groups envisaged by the Project, the members of which are provided in the Part 3 of the present document.
There has also been an important technical and scientific consultation by the Center of Renewable Sources and Energy Saving (CRES).

A considerable part of the document derived from the speeches delivered on the occasion of the two Seminars organised by DAFNI network on Energy Efficient Public Procurement; the speakers' names are also provided in the Part 3.

Furthermore, the results of the EFFECT Project have been assessed, in particular:

- The National Fact Sheet
- The Transnational Energy Efficient Public Procurement Procedures Catalogue (EEPP)
- The conclusions drawn from the national questionnaires and the Project SWOT Analysis.
- The shared Energy Efficiency Criteria proposed by the Project.

1.2 South East Europe Programme-SEE

The South East Europe Programme-SEE is a financial framework of the EU, aiming at reinforcing transnational relations within the SEE countries in strategic fields, in order to improve the territorial, economic and social integration procedures and to contribute to the achievement of cohesion, stability and competitiveness in the area.

The main objectives of the programme are:

- Innovation, entrepreneurship, knowledge and information society.
- Integrated approaches and tangible cooperation actions aiming at promoting sustainable development, access to nature and knowledge and environmental quality.
- Upholding transnational territorial cooperation.

http://www.southeast-europe.net

To fulfill its objectives, the Program provides financial support to projects, like EFFECT, within which the present document has been drawn up.
www.effectproject.eu

1.3 The EFFECT Project, main conclusions, recommendations.

1.3.1 General description

Public procurement in the EU accounts for more than 16% of the European GDP and constitutes a precious instrument for energy saving through production and consumption of energy efficient products and services.

The EFFECT Project stems from the need to modernize public procurement procedures in SEE countries and integrate them with energy efficiency criteria, in order to comply with the EU requirements and contribute to the achievement of its energy-related targets. The Project's direct objective is to promote the adoption of a European policy for renewable energy in the SEE area, enhancing the capacity of public authorities and key local energy stakeholders in relation to Energy Efficient Public Procurement (EEPP). The project's final aim is to improve competitiveness and promote a balanced and sustainable economic development that will be able to address the increasing energy demand.

1.3.2. Main conclusions of the EFFECT Project on the situation related to EEPP

The existing status in the countries has been recorded in the framework of the Project both generally and particularly in the areas involved. Certain crucial conclusions for Greece and some general recommendations for the improvement of the situation recorded in the countries are briefly provided herein below.

1.3.2.1. The side related to Demand – Public Sector

<u>Conclusions for Greece – strengths</u>

- There is a National Energy Strategy, which is mainly linked to the EU targets.
- There is National planning, particularly as regards energy efficiency for buildings.
- There are competent authorities in charge of coordinating and facilitating the enforcement of EEPP standards (Ministry of Environment, Energy and Climate Change).
- There are experts or authority departments able to support the preparation and the drafting of the specifications for notices, mainly in the case of buildings.
- There is relevant legislation in force for buildings and vehicles.
- Training actions are being undertaken at a local level.
- The existence of measurement instruments (CO_2, etc.) is acknowledged.
- The participation of Municipalities in the European initiative "Covenant of Mayors" is encouraging.
- Moreover, the national initiative "Pact of Islands" is a leading force for Municipalities of Greek islands.

<u>Conclusions for Greece – weaknesses</u>

- There is no framework for the systematic implementation of the EEPP criteria.
- Iinformation about the obligations resulting from the national and European strategy and the relevant institutional framework is insufficient.
- There is a lack of training and awareness with regard to the advantages of EEPP.

- In most cases there is no group of support or coordination between the various departments of the competent authorities.
- No instruments for the calculation of CO_2 or EU instruments are used in the field of Green Public Procurement.
- There is inadequate or no guidance at an operational level on how existing policies are to be implemented.
- In some cases, the regional administrations do not promote such programmes (political obstacles).
- There are no standardised specifications for products and services.
- There are critical economic obstacles because of the cuts in local administrations' resources.
- There is a delay as to the transposition of European policies into national provisions.
- There is no Regional Energy Planning.
- Regional – Municipal services, Energy Offices, Directorates are understaffed or inexistent.
- The particularities of islands, such as the natural environment, insularity, isolation, limited space, tourist period etc., are not taken sufficiently into account, whereas they should constitute a special framework to be integrated in the general energy planning of the country as well as to the specific local procurement procedures.

1.3.2.2. The side related to supply in the EFFECT countries

The research conducted within EFFECT has lead to certain conclusions concerning the obstacles that the private sector should overcome in all countries, in order to promote energy efficient products in public procurement. The most crucial obstacles are the following:

- The importance attached to energy efficiency by the various companies in each country varies.
- There are no obstacles that are specific for a country, sector or company size.
- Certain obstacles are not linked to Energy Efficiency, but rather to the general relation of companies with the public sector, such as:
  - Difficulties related to time availability and bureaucracy when submitting a proposal.
  - Lack of flexibility or transparency of the notice.
  - Unreliability of the public sector, when it comes to payments.
  - The failure to use instruments for the calculation of the Lifecycle Cost in the public sector entails the failure to opt for the aforementioned products.
  - Public entities usually prefer conventional solutions.

1.3.2.3. Solutions to overcome obstacles

The companies/suppliers interviewed have proposed solutions, the most important of which, are the following:

- Information, awareness raising, training.
- Targeting of highly energy efficient products.
- Financial tools.
- Participative procedures and cooperation among suppliers and between the public and the private sector.
- Facilitation of procedures, definition of criteria, products and services.
- Utilisation of external knowledge/experience/know-how.
- Utilisation of available instruments and manuals (e.g. "Buying Green!" of the EU, ECO LABEL rules (http://ec.europa.eu/ecat).
- Definition of a clear regulatory framework for supplies and the new "requirements".
- Provision of incentives, such as tax exemptions, etc. for the suppliers involved.
- Incentives aiming at curbing the phenomenon of "preference" of given suppliers.
- Promotion of local certified suppliers.

- Economy of scale, by using mechanisms, i.e.:
  - Shared public procurement.
  - Application of Energy Management Systems (EMS).
  - Networking / exchange (the EU shall install, in the framework of the Directive, an online platform for the exchange of experience, innovative solutions, etc.).
  - Identifiability of the companies providing such products.
  - Training of SMEs.
  - Networks of companies (professional clusters).
  - Entities bringing together intermediate technical experts.

1.4 The European framework

1.4.1. Political context, conditions and targets

The climate-energy package is a set of legal instruments aiming to ensure the fulfillment of the EU's ambitious objectives for 2020. These objectives, known also as "20-20-20 targets" are three and, in particular:

- 20% reduction in EU greenhouse gas emissions from 1990 levels.
- Increase of the share of energy produced from renewable resources to 20%.
- 20% improvement of the EU's energy efficiency.

The targets were set in 2007 by European leaders, who committed themselves to transforming Europe into a highly energy-efficient, "low carbon" economy and were activated through the aforesaid climate and energy package in 2009. The EU also intends to intensify its emissions reduction to 30% by 2020, on condition that other major economies of the developed and developing world commit themselves to undertaking their fair share within a global effort to reduce emissions.

The 20-20-20 targets represent an integrated approach to climate and energy policy, in order to address climate change, increase the EU's energy security and enhance its competitiveness. Moreover they constitute the central objective of the European 2020 Strategy for smart and sustainable development. This reflects the acknowledgement that the struggle against climate change and energy challenge contributes to the creation of jobs, the generation of "green" growth and to the reinforcement of Europe's competitiveness. The achievement of the 20% renewable energy target is estimated to result in a net effect of approximately 417000 additional jobs, whereas efforts to improve energy efficiency by 20% in 2020 shall give rise to a net employment increase by 400000 jobs (European Commission, 2010).

1.4.2. Energy Efficiency Plan

Energy saving is considered a key component for the European energy policy and one of the cornerstones of the EU 2020 strategy. The plan proposed includes various guidelines for the transition to a more effective economy in terms of energy sources use. The 2011 Energy Efficiency Plan is part of the European objective for the 20% improvement of energy efficiency and of the 2020 Energy Strategy and aims to:

- Promote an economy that shall respect the planet's natural resources.
- Develop a low carbon dioxide emission system.
- Improve the energy independency of the European Union.
- Strengthen the security of energy supply.

To meet the objectives described above, the European Commission proposes actions at different levels:

- To promote low energy consumption in the construction sector.
- To develop a competitive European industry.
- To adjust national and European funding.
- To reduce expenses for consumers.
- To improve transport effectiveness.
- To extend the scope of the national framework.

1.4.3. The Directive on Energy Efficiency

On October 25, 2012 the EU adopted the 2012/27/EU Directive on Energy Efficiency. The Directive establishes a set of measures aiming at promoting energy efficiency within the Union, in order to ensure that the essential 20% target on energy efficiency for 2020 is met and pave the way for further improvement after that year. It sets rules defined to remove barriers in energy market and overcome potential failures that hinder the effectiveness with regard to the supply and use of energy, as well as to contribute to the consolidation of indicative national efficiency targets for 2020 (European Commission, 2010).

1.4.4. Achievement of an energy efficient Europe

1.4.4.1. Basic steps

The basic steps set by the EU to achieve an energy efficient Europe are:

- Action 1: Utilisation of the energy saving potential in buildings and transport.
- Action 2: Improvement of industrial competitiveness, rendering industry more efficient.
- Action 3: Enhancement of the energy supply.
- Action 4: Creation of National Energy Efficiency Action Plans.

1.4.4.2. European Treaty

The most significant relevant principles enshrined in the European Treaty are the following:

- Free movement of goods
- Free competition – removal of restrictions on participation.
- Fair competition – equal terms for all participants.
- Blind competition – no relations among participants.
- Principle of free supply of services.
- Anti-fragmentation principle.
- Principle of equal treatment.
- Principle of proportionality.
- Principle of transparency.

1.4.5. European legislation.

The essential European legislation for Energy Efficient Public Procurement includes the Directives provided below:

- Directive 2006/32/EC on energy end-use efficiency and energy services and repealing Council Directive 93/76/EC, recently replaced by Directive 012/27/EU on energy efficiency.
- Directives on Public Procurement (2004/18/EC and 2004/17/EC).

- Directive 2010/30/EU on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products.
- Directive 2010/31/EU on energy efficiency of buildings.
- Directive 2009/125/EC establishing a framework for the setting of eco-design requirements for energy-related products.
- Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles.
- Regulation (EC) No 1222/2009 on the labelling of tyres with respect to fuel efficiency and other essential parameters (Updates with Regulations 2011/228/EC, 2011/1235/EC).
- Regulation (EC) No 106/2008 of the European Parliament and of the Council of 15 January 2008 on a Community energy-efficiency labelling programme for office equipment (Energy Star) (Updates with Regulations 2009/789/EC, 2009/489/EC, 2009/347/EC).

1.5. National framework

In Greece, energy saving could constitute one of the most significant national resources. In this framework, public procurement may contribute to the energy saving and have a crucial impact on the overall energy balance of the country and its input as far as the greenhouse effect is concerned. Although some encouraging steps forward have been taken, mainly with regard to the adoption of European requirements, the sector of procurement is still at an early phase and requires further implementing legislation and regulations, as well as the mobilisation of the competent authorities.

1.5.1. Main National Legislation - Regulations

The main national legislation concerning Energy Efficient Public Procurement is the following:

- Joint Ministerial Decree Δ6/B/14826/2008, Greek Official Gazette B΄ 1122) on measures aiming at improving energy saving in the public sector, including:

- Replacement of old energy-consuming equipment.
- Installation of automatic energy consumption control systems in public buildings.
- Purchase of machines and peripherals with energy labels.

- Law No 3855/2010, integrating Directive 32/2006/EC, setting the minimum energy efficiency requirements in procurement procedures for different categories of products within the general public sector and implementing a methodology which aims at minimizing the lifecycle cost of the products purchased and ensuring their economic sustainability.
- Law No 3982/17/2011/Part 4, integrating Directive 2009/33/EU, which promotes clear and energy efficient vehicles for road transport.
- Ministerial Decision No.12400/1108 (Greek Official Gazette B' 2301/14/10/2011) for the harmonization of the Greek legislation in line with Directive 2010/30/EU of the European Parliament on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products
- Presidential Decree 7/2011 (Greek Official Gazette A΄ 14/11.02.2011) on the definition of ecological planning requirements with regard to energy-related products in compliance with Directive 2009/125/EC of the European Parliament and the Council and amendment of the Presidential Decree 32/2010 (Greek Official Gazette A 70) concerning the definition of ecological planning requirements as regards energy consuming products and amendment of the Presidential Decrees 335/1993 (Greek Official Gazette 143/A/93), 178/1998 (Greek Official Gazette 131/A/1998) and Joint Ministerial Decree Δ6/B/17682 (Greek Official Gazette 1407/B/2001) in accordance with Directive 2005/32/EC of the European Parliament and the Council.
- Presidential Decree 60/2007 (transposition of Directive 2004/18/EC for the award of contracts for products and services), art. 48 on Environmental Management Standards

and, art. 53 par. 3β and 6 on technical specifications with reference to environmental characteristics or environmental standards (important although not directly relevant to energy saving).

- Presidential Decree 118/2007, L. 3463/2006.
- Law 3851/2010 for the promotion of the use of Renewable Energy Sources (measures for the use of RES in buildings and contributory contributions at local level through the installation of RES units).
- Law 3661/2008 and Ministerial Decree for the Regulation on Energy Efficiency of Buildings (KENAK).
- Law 3889/2010 on the Green Fund.
- Law 4122/2013 on the Energy Efficiency of Buildings – Transposition of Directive 2010/31/EU.
- Regulation on Energy Efficiency of Buildings – K.E.N.A.K. (Joint Ministerial Decree Δ6/Β/οικ. 5825/2010, Greek Official Gazette Β΄ 407)

The aforementioned laws do not provide for specific targets as to the share of green public contracts against the total public contracts awarded, or for specific quotas with regard to groups of products, which, however, are expected to be set by the National Action Plan for Green Public Procurement.

During the drafting of the National Action Plan for Green Public Procurement (GPP) the following substantial interventions have been carried out:

- Pursuant to Law 3855/2010, an **Inter-ministerial Committee** was established. This Committee aims primarily to proceed to the "drafting of an Action Plan to promote Green Public Procurement and submission of proposals for national policy making". Its competences include between others responsibilities for:
  - The prompt information of suppliers of the public and wider public sector, as well as other stakeholders.
  - The supervision of the drafting of environmental criteria or the adoption of those already issued by the European Commission.
  - The selection of products, services and works for which environmental criteria shall be applied.
  - The assessment, implementation, monitoring and updating of national policy and the Action Plan in the country.
  - The recommendation to the Minister of Environment, Energy and Climate Change and the competent Minister of any necessary legislative provision and modification of the existing legislative framework, if needed.
  - The adoption of the measures required for the enforcement of the relevant provisions on Green Public Procurement and the fulfillment of their aim, for recommending that the Minister of Environment, Energy and Climate Change and the competent Minister.
  - The invitation of specialized experts and scientists involved in research on the topics falling within the scope of the Committee, in order to ensure the technical and scientific support to the Committee, that the Minister of Environment, Energy and Climate Change and the competent Minister proceed to the assignment of studies and programs, in order to promote the implementation of Green Public Procurement and the fulfillment of the Committee's tasks.
  - The organisation or participation in workshops, programs, conferences or public debates, in order to inform, develop and disseminate the principles and applications of Green Public Procurement.
- A study on products and services with environmental characteristics has been commissioned, aiming at assessing the degree of the market preparedness to integrate green criteria in public procurement.

The abovementioned Committee (together with a "Green Office" within the Ministry of Environment, Energy and Climate Change, which has not been established as yet) aspires to ensure the support and

the prompt supply of information to the public contracting authorities and to the market suppliers. Their role consists in forming a cooperation framework through the creation of working groups and in coordinating all the necessary actions to develop environmental criteria and select specific products and services for the criteria to be applied.

However, for the proposed actions to be widely accepted, the cooperation and involvement of Regional, Municipal Entities – Directorates should be more intensified.

1.5.2. Other provisions and measures – actions for the promotion and implementation of Green Public Procurement (GPP)

1.5.2.1. Actions within the framework of the Energy Efficiency Management Plans (EEMPs) implementation.

In the framework for implementing the National Energy Efficiency Action Plans, the following Energy Efficiency Improving Measures related to GPP have been described:

- Measure for the adoption of Energy Management Systems in the public sector.
- Measure concerning the obligatory contracting procedures with energy saving and renewable energy technologies for public buildings.
- Measure concerning the gradual replacement of low energy efficiency lighting equipment in the wider public sector.
- Measure providing for the installation of central solar-powered systems for hot water in public buildings.

The elaboration of further Regional energy action plans is, though, useful before implementing the improvement measures.

Furthermore, numerous demonstration and pilot actions of the public sector have been launched by means of the National Strategic Reference Framework (NSRF 2007-2013). These actions are described as Measures of the National Energy Efficiency Action Plan and they are expected to enable substantial energy savings, while at the same time acting as multipliers. These actions include:

- Energy upgrading of the existing public buildings through the Energy Service Companies (ESCOs) and the promotion of the Energy Performance Contracting mechanism.
- Energy planning of public authorities, "EXOIKONOMO" ("I SAVE/ENERGY SAVING") funding program, measures for building energy upgrading and supply of energy efficient products.
- Application of the Green Roof in public buildings.
- Installation of high performance cogeneration units with natural gas in hospitals.
- Interventions for the enhancement of energy efficiency in school buildings.
- Interventions aiming at saving energy in public buildings through Renewable Energy or energy efficiency systems.
- Urban bioclimatic design program for urban areas.

1.5.2.2. Pending provisions

Apart from the legislation in force, there are ongoing, pending or expected provisions with regard to:

- Minimum technical/energy characteristics per category of equipment.
- Mandatory quota of energy efficient vehicles in public authorities or entities and inclusion of the lifecycle cost analysis in the equipment selection procedures (relevant Joint Ministerial Decrees are expected in this regard).

1.5.2.3. Institutional developments

European Directive 2012/27/EU on energy efficiency which provides for the adoption of a concrete national energy saving target by 2020 was issued in November 2012 and is required to become a law of the state in 18 months. Article 5 highlights that public entities' buildings may play a crucial role and set a good example (mandatory minimum 3% renovation rate of the total floor area in the buildings occupied by the central government, with a view to meeting the minimum annual energy efficiency requirements).

Moreover, article 6 stipulates the rules for purchases by public authorities. Member states ensure that their central administrations purchase exclusively high energy efficiency products, services and buildings, as long as this enables their economic efficiency and feasibility, the general viability, technical suitability and sufficient competition. Furthermore member states encourage public authorities at regional and local level to, inter alia, purchase energy efficient products and services and award high energy performance contracts, taking into consideration the relevant competences and the administrative structure and following the example set by their central government.

1.5.3. Competent authorities

In Greece the main public Authorities responsible for the mainstreaming of energy into Public Procurement are:

- The Ministry of Interior, Decentralization and E-government
- The Ministry of Development, Competitiveness, Infrastructure, Transport and Networks
- The Ministry of Environment, Energy and Climate Change.
- The Regional Authorities.

On the other hand, the Ministry of Development, Competitiveness, Infrastructure, Transport and Networks with the General Secretariat for Trade and Public Works are in charge of forming the general policy for procurement and works, as well as organizing and developing the necessary guidelines for awarding public contracts and publicity. The new National E-Procurement System of the Ministry of Development, Competitiveness, Infrastructure, Transport and Networks, which relates to both supplies and works, is expected to play a fundamental supporting role in the organisation, information, control and knowledge exchange for EEPP.

However, the problems likely to arise from a central procurement system in terms of delays and further reduction of the local society's know-how, entrepreneurship and employment, restriction on the freedom to implement energy efficient supplies and the possibility to proceed to corrective measures have to be acknowledged.

The Regional authorities consider that simplification and decentralization shall activate the regional potential and bring forward the necessary solutions at regional level. The development of technical specifications by central services is necessary nevertheless, the remaining procedures must take place upon the regional authority's responsibility, should a boost to local entrepreneurship, innovation and employment be considered an objective to be attained.

1.5.4. Complementary supporting framework

In Greece there are no official guidelines, instructions or manuals with reference to GPP. Law 3855/2010 provides for the enforcement of the Ministerial Decree setting the minimum energy efficiency requirements in public procurement and shall promote the adoption of a methodology with a

view to minimizing the lifecycle cost of products supplied to the public sector, in order to ensure their economic sustainability.

Moreover, Law 3855/2010 includes specific actions for the supply of energy efficient products and services for public buildings. Finally, as far as vehicle supply in the public sector is concerned, the Law stipulates a mandatory quota for clean vehicles, the replacement of old medium and heavy-duty vehicles and the purchase of vehicles according to fuel saving labels as a selection criterion.

1.5.5. Selection / quality assessment criteria

No such criteria for GPP have been imposed by the legislation, except for those defined in the Joint Ministerial Decree Δ6/Β/14826/2008, which includes requirements for lamps, portable computers, printers and fax machines, pc screens, air conditioners, cooking and refrigeration appliances.

1.5.6. Other means / information / training

Law 3855/2010 stipulates that the public sector and all public authorities need to exchange information on the best practices pertaining to energy efficiency enhancement, including the Energy Efficient Public Procurement, upon coordination by the Ministry of Environment, Energy and Climate Change.

The most significant information and monitoring measure has been the appointment of an Energy Supervisor in all public buildings, who shall be responsible for monitoring energy consumption in the buildings involved, while also being obliged to submit an annual energy report to the central service and to the Ministry of Environment and to approve the modification or supply of energy consumption equipment.

It is an overriding priority to develop a database containing the said annual reports and contact details of the energy administrators, which shall be complemented with specialized manuals, technical requirements and e-learning tools for energy administrators.

1.5.7. Some encouraging steps forward

The European initiative "**Covenant of Mayors**" has positively contributed to the local administration's procedures with reference to the promotion of the criteria for Green Public Procurement. Several Municipalities have already incorporated energy efficiency requirements in the criteria they apply. However, in the absence of a central service in charge of monitoring the said criteria, their use depends on the level of information possessed by the contracting authority and they are applied in the form of minimum requirements, with no extra points awarded to the most efficient of them.

Furthermore, the original national initiative "**Pact of Islands**", according to the example set by the Covenant of Mayors, commits the Municipalities of Greek islands to implementing the principles of energy saving, through an adjustment to the insular areas' particularities.

The **National E-Procurement System**, which is already operational in the Ministry of Development, Competitiveness, Infrastructure, Transport and Networks, shall bring about a notable improvement through the electronic publication and the tools it will provide the competent authorities with, e.g. technical specifications, costing, selection criteria, for the best possible execution of all their public contracting procedures.

Eventually, the development of a database containing the minimum technical criteria for groups of products and the creation of a lifecycle cost tool to be used by the procurement departments, duly accompanied by the relevant training, will further enhance energy efficiency of public procurement in Greece. Besides this is deemed inevitable in view of the recession the country is going through and the

fact that viewing the lowest price as the absolute criterion in public procurement hinders energy performance.

1.6. Energy Efficient Public Procurement

Certain fundamental principles of contracts involving the supply of products and services are provided below. Many of these principles are enshrined in the articles of Presidential Decree 60/2007 and Law 11389/93 (Single Procurement Regulation for Local Authorities, EKPOTA).

The main phases of a contract, in which the energy dimension may be incorporated, are:

1.6.1. Object of the contract

The use of a title referring to energy saving conveys a message not only to potential suppliers/contractors, but to the local community and other contracting authorities as well.

1.6.2. Technical specifications

1.6.2.1. Energy dimension

The energy dimension may be introduced in the following sections of the tender documents, provided that specifications are clear and comprehensible:

- In the description of the contract's object and the minimum compliance requirements.
- In the requirements according to which tenders shall be evaluated.
- In their formulation by reference to European, international or national standards or in terms of performance or functional requirements (which may contain energy-related characteristics).
- In the wording with reference to the energy labeling.

1.6.2.2. Use of technical standards

The technical specifications may also make use of Technical Standards related to energy. Under Article 53, Presidential Decree 60/2007 (Annex VI) & Article 4, EKPOTA, the standards that may be used are:

- International standard: a standard approved by an international organisation for standardization which has been made available to the public
- European standard: a standard approved by a European organisation for standardization which has been made available to the public
- National standard: a standard approved by a national organisation for standardization which has been made available to the public
- Reference to performance or functional requirements
- Each reference should be accompanied by the words "or equivalent".

1.6.2.3. Description

Pursuant to Article 53, Presidential Decree 60/2007 & Article 4, EKPOTA, specifications

- Describe the outcome pursued and the expected performance,
- Do not define the production means or working method of the supplier, who is free to Propose the most suitable solution,
- The wording "or equivalent" is required here as well.

1.6.3. Verification of compliance:

Compliance is verified as follows:

- Reference to binding legislation. The proof of accordance with such legislation or with its application at national level is normally provided by the supplier since this is a necessary condition for the exercise of an entrepreneurial activity within the EU.
- Use of energy labeling criteria; in this case, the products or services bearing the said labels are considered to meet the specifications.
- Submission of test results, a technical dossier or a declaration by the manufacturer.
- Application of technical standards, by using the compliance evaluation procedure in force for the relevant standard and by accepting certification as a proof of the product's conformity.

1.6.4. Criteria for the selection of suppliers

- Exclusion criteria (Article 43, Presidential Decree 60/2007 & Article 7, EKPOTA):
  Two of the criteria may assume an energy/environmental dimension:
  - In case of conviction for offences concerning the professional conduct.
  - In case of grave professional misconduct.

  Buyers cannot use the grounds for exclusion, in case there is no national legislation which equates a given violation with professional misconduct.

- Selection criteria (Article 46, Presidential Decree 60/2007):
  - Technical Capacity.
  - Experience in the execution of supplies of products or services related to energy consumption or use.
  - Duly trained personnel.
  - Availability of the necessary equipment for the installation/manufacture of the product or service to be assigned.

- Certification according to the Energy Management standard (ISO50001) in case of contracts of works and services, which may be required, provided that it relates to the object of the contract.

1.6.5. Evaluation of tenders.

Tenders may be evaluated as follows:

- On the basis of the lowest price.
- On the basis of the most economically advantageous tender.
- In case tenders are evaluated on the basis of the lowest price, the criteria of the notice must be clear and strict, in order to opt for the solutions which meet the minimum energy efficiency prerequisites.

1.6.6. Rules applying to the evaluation criteria

The evaluation criteria should:

- relate to the object of the contract,
- not grant unlimited freedom of choice,
- ensure they are verifiable,
- be published in advance,
- not be regarded as selection criteria,
- comply with the community legislation.

1.6.7. Criteria application

For the criteria to be applied, the following is required:

- A minimum level of performance as regards the technical specifications should be defined and additional points should be awarded for better performances in the evaluation phase (e.g. in case eco label standards are adopted, extra points should be awarded for performances that do better than those provided for by the said standards).
- Assessment of the criterion on the basis of energy requirements.
- Evaluation of the Lifecycle Cost.

The evaluation must take into consideration:

- The purchase price and relevant expenses (delivery, installation, activation, etc.).
- The operation cost, including energy, spare parts and maintenance.
- The resultant cost at the end of the lifecycle (e.g. cost of decommissioning or of cessation of disposal).

1.6.8. Terms for the execution of the contract

The rules governing the terms and conditions of the contract should:

- Not consist in technical specifications, or evaluation or selection criteria.
- Be able to include specific obligations agreed upon during the contract award.
- Be clearly defined in the invitation to tender.
- Relate to the execution of the contract.
- Not entail positive discrimination in favor of any contractor.
- Enable the use of environmental terms in the type of product delivery adopted.
- Enable the use of ways to improve the environmental impact of the contract, such as:
  - Delivery of the proper quantities.
  - Delivery at off-peak times.
  - Recovery of any packaging accompanying the product.
  - Reference to the carbon dioxide emissions and the measures adopted by the supplier to reduce such emissions.
- Enable the monitoring of compliance, by means of:
  - The provision of proofs of conformity.
  - In situ controls by the contracting authority.
  - Assignment to a third party.
  - Sanctions for non compliance or reward for good performance.

1.6.9. Lifecycle Cost

The argument predominantly advanced against the use of "green" or energy efficiency criteria in the framework of the supply of products and services relates to their higher cost. Such a generalisation, however, quite often is groundless, since there are, indeed, numerous products at similar or even lower prices than the traditional ones.

Today, the proper way to evaluate the cost is the consideration of the total cost during the whole lifecycle of the product. In case of an energy efficient building, for example, construction is likely to cost more, but its lower operating cost (heating, etc.) enables a limited time of depreciation and a better financial return of the investment. Although such a ratio may vary from one product category to the other, as far as energy efficiency is concerned, the overall benefit seems to be better if compared with the initial cost.

2. PART 2: ENERGY EFFICIENCY CRITERIA

EXAMPLES IN THE FIELD OF PUBLIC PROCUREMENT

In the following pages indicative criteria related to the four major areas of energy consumption products, services and projects are presented.

The proposed criteria and rules are based on the EFFECT project recommendations which have been either, depending on the case, adapted to the Greek legislation where it exists, or to the minimum European standards applicable in the Greek context.

2.1 Construction and Building Sector

2.1.1 New buildings or renovation of old buildings

Buildings account for the lion's share of total energy consumption and have, therefore, considerable energy saving potential. Many buildings date back to the 80's and 90's or even before, when energy standards were still comparatively lax. There is also huge potential for savings in non-residential buildings. The more the price of energy goes up, the more energy efficient buildings become attractive.

Energy efficiency interventions are possible during the procurement of public construction works, including the supply of related services such as cooling, heating and ventilation and the provision of electricity. These interventions relate to all the design stages of buildings, as well as to construction, use and disposal.

At the same time, when a public body purchases or rents a privately-owned building, it can request the fulfilment of a set of minimum specifications depending on the building's energy class (see 2.1.1.2) or the implementation of specific energy related interventions capable of improving the building's energy efficiency.

In Greece, the Regulation on Energy Efficiency of Buildings (**K.EN.A.K.** – Joint Ministerial Decree Δ6/Β/οικ.5825/2010) sets out the main energy saving rules applicable in the construction industry.

2.1.1.1. Basic interventions

As regards technical specification drafting, the best approach is to focus on buildings as a system, instead of just an accumulation of many particular building units.

The main energy saving recommendations that can be used in tendering procedures for the construction of new buildings, as well as for renovation and maintenance contracts, are the following:

- Construction of new/renovated buildings, achieving an energy performance similar to the low energy building or passive house standard, using intelligent energy service solutions. Buildings must comply with National/European regulations and not violate the specified National Energy Efficiency Criteria and especially the Regulation on Energy Efficiency of Buildings (*K.EN.AK).*
- Experience of the architect in energy efficiency building design (bioclimatic design for thermal and visual comfort, integration of passive solar systems and RES systems).

- Suppliers must demonstrate their technical capacity according to the applicable environmental management measures and equivalent certificates (standard ISO 50001).
- Energy efficient and RES friendly construction design based on a specific energy demand per m² including heating, cooling, ventilation and lighting for older constructions.
- The use, if required and on a case per case basis, of guaranteed performance contracts with Energy Service Companies (ESCOs).
- Use, if required, of LCC and LCA tools in design.
- Advance costing is necessary, as well as economic documentation and valuation of the outcome and of the energy efficiency following the completion of the intervention, by means of documents, such as the electricity bills, heating oil invoices, etc.

An equally important intervention is the implementation of an Energy Management System that ensures a continuous improvement process. An energy management system like ISO 50001 will monitor and optimize energy consumption and coordinate the technical and financial management of energy expenditure related actions. Important tools for the implementation of an energy management system are the deployment of training and awareness programs, the development of energy performance indicators and the use of monitoring and measuring tools.

2.1.1.2. Energy Performance Certificate for Buildings

An important step towards increasing energy savings in buildings is the Energy Performance Certificate whose major advantages are the following:

- It helps to investigate and identify the existing energy consumption of the building and provides suggestions on how to improve it,
- It provides reliable information on a building's energy quality, demonstrates sensible savings potential and offers concrete modernisation recommendations,
- It increases transparency in the real estate market and encourages owners to invest in their buildings,
- It contributes to the building renovation process and indicates whether a refurbishment is actually necessary or not. A thorough renovation of an old building provides many opportunities to save a lot of money from the lower energy consumption. Moreover, it enables a limited time of depreciation thanks to lower operating cost.
- In many European countries, this Energy Efficiency Certificate is necessary to finance the construction / renovation of a building.
- It is used to classify buildings by benchmarking them on the basis of energy indicators such as kWh, kWh/ m2 or kWh/m2*a. These indicators can cover almost all buildings and procedures. This standardization shall not be based on a comparison with the national averages, but rather on a comparison with the best energy classes or practices and how they are achieved or implemented.

As a conclusion, the following criterion is recommended:

Table 2.1.1: Construction Sector – Energy Classification of Buildings

Criterion 1	
Objective	Total Primary Energy Consumption of the building
Performance indicator	Energy Class (A+ to H)
Performance Required	B or better
Assessment method	Methodology of National Regulations for energy efficiency in buildings

2.1.1.3. Construction materials

The use of thermal insulation products is almost compulsory in every opaque building component, since they contribute considerably to achieving energy savings by reducing heating fuel requirements. However, the energy consumed during their manufacture and transportation should also be taken into account.

According to the Construction Products Directive 89/106/EEC, thermal insulation products must fulfil certain requirements in order to receive the CE marking, which should be considered a prerequisite for a supplier in order to select a product.

The main thermal insulation material aspects to be taken into consideration are summarised below.

- Opt for the most energy efficient thermal insulation products.
- Opt for the appropriate insulation products for each situation in order to ensure maximum benefit.
- Thermal insulation products must bear the CE mark.
- Promote effective maintenance of insulation, to extend its useful life.
- Promote end of life management mechanisms e.g. take back schemes / re-use / recycling, etc.
- Purchase products designed to be easily dismantled and recycled.
- The global warming potential index of the thermal insulation should be as low as possible.

The current legislation regarding energy efficiency in buildings also introduces stricter limits in terms of the thermal transmittance (U-value) of various building components. These parameters are standard values of modern and energy efficient buildings and should not be exceeded. The maximum thermal transmittance values (U_{max}) vary depending on the climate zone. The following Umax (thermal transmittance) values apply for Greece.

Table: 2.1.2 Building sector – Maximum thermal transmittance (Umax) values for Greece

Building component	Maximum value U- [W/m²K] **Climatic Zone**			
	A	**B**	**C**	**D**
External horizontal or inclined surfaces in contact with external air (roofs)	0.50	0.45	0.40	0.35
External walls in contact with external air	0.60	0.50	0.45	0.40
Floors in contact with external air (pilotis)	0.50	0.45	0.40	0.35
Floors connected to the ground or with closed, unheated spaces	1.20	0.90	0.75	0.70
Walls in contact with the ground or with an unheated space	1.50	1.00	0.80	0.70
Spacings (windows, French windows, etc.)	3.20	3.00	2.80	2.60

Building component	Maximum value U- [W/m²K]			
	Climatic Zone			
	A	B	C	D
Façade glass panes closed or partly open.	2.20	2.00	1.80	1.80

Some countries, such as Greece, have, in addition to the building components limit, a maximum mean building thermal transmittance coefficient (U_m) per climatic zone. This maximum building U-value (U_m) is the sum of every building component individual U-value and area to the total area of the building envelope.

Table 2.1.3 illustrates the maximum building thermal transmittance coefficient $U_{m,max}$ values according to the area, climate zone of the building and A/V ratio (surface area to volume).

Table 2.1.3: Building Sector - Maximum mean building thermal transmittance coefficients $U_{m,max}$

Area / volume A/V [m^{-1}]	**Maximum mean building thermal transmittance coefficient $U_{m,max}$ [W/(m^2.K)]**			
	Zone A	**Zone B**	**Zone C**	**Zone D**
≤ 0.2	1.26	1.14	1.05	0.96
0.3	1.20	1.09	1.00	0.92
0.4	1.15	1.03	0.95	0.87
0.5	1.09	0.98	0.90	0.83
0.6	1.03	0.93	0.86	0.78
0.7	0.98	0.88	0.81	0.73
0.8	0.92	0.83	0.76	0.69
0.9	0.86	0.78	0.71	0.64
≥ 1.0	0.81	0.73	0.66	0.60

Based on the above values, the following criteria are recommended:

Table 2.1.4: Building Sector – Thermal Transmission Coefficient

Criterion 1	
Objective	Thermal Transmission Coefficient (U value)
Performance indicator	W/(m²K)
Performance Required	Table 2.1.2
Assessment method	Certified technical specifications

Table 2.1.5: Building Sector – Mean thermal transmission coefficient

Criterion 2	
Objective	Mean thermal transmission coefficient (U_m)
Performance indicator	W/(m²K)
Performance Required	Equal or better than 2.1.3 table values
Assessment method	Energy study calculations

2.1.2. Heating and cooling systems

The systems for the coverage of heating and cooling loads are characterized by significant energy consumption. Therefore, the selection of high energy performance systems in the framework of public procurement is crucial in order to reduce energy consumption and the corresponding expenses and protect the environment.

The main criteria to be taken into consideration in the procurement of heating and cooling systems are described below for each system separately and refer among others to certification and/or labelling.

2.1.3.1. Solar thermal systems

A solar thermal system can be considered efficient if certified under the CEN Keymark scheme. Solar Keymark is a voluntary label developed by the European Solar Thermal Industry Federation with a view to supporting consumers in the purchase of high quality solar collectors and systems. All solar panels have to demonstrate their compliance with the required European quality standards by means of this or an equivalent certificate. The same applies to solar thermal systems (all components).

Furthermore, solar thermal systems must be insulated (minimum insulation thickness: 35mm), in order to reduce energy losses, and must be CE certified.

2.1.3.2 Heat pumps

Heat pumps are evaluated either based on their Coefficient of Performance (COP) values (heating) or on their Energy Efficiency Ratio (EER) for cooling. The said values should be taken into consideration in equipment selection and should be combined with a detailed study ensuring the appropriate dimensioning of the system to be purchased, based both on the building characteristics and uses and on the climatic zone concerned.

The European Heat Pump Association has developed a quality label, in order to promote high energy efficiency and quality heat pumps. Under this scheme, it is required that all main heat pump components conform and comply with the applicable regulations (CE-marking) and that their specifications guarantee a set of minimum efficiency values for every heat pump type both with regard to COP (performance coefficient) values and to sound levels.

The minimum efficiency values per heat pump type, as specified by the European Heat Pump Association, are illustrated in the following table.

Table 2.1.6a: Building Sector – Minimum efficiency values per heat pump type

Type of heat pump	**Temperature**	**COP – performance coefficient**
Closed geothermal heat pump systems - Brine/Water	B0/W35	4.3
Geothermal Heat pump systems – water / water	W10/W35	5.0
Air / Water heat pumps	A2/W35	3.1
Direct Exchange ground coupled to water	E4/W35	4.3

As regards heating, the European Heat Pump Association examines COP measured values according to Standard EN 14511 (Parts 1-4) and certifies the heat pump by awarding the corresponding quality label.

It is worth mentioning that the minimum COP values proposed by the European Heat Pump Association are similar to the minimum efficiency values according to the Eurovent certification for energy efficient classes A and B. Both the European Heat Pump Association certificate and the Eurovent certificate are based on Standard EN 14511.

Furthermore, a high energy-efficiency heat pump system must include energy efficient electrical equipment. Consequently, since 2013 it is mandatory to install standalone or integrated circulators, whose Index of Energy Efficiency (Energy Efficiency Index - EEI) is lower than or equal to 0.27 according to Regulation 641/2009/EU and the Directives 32/2005/EU and 125/2009/EU. Finally, Standard EN 60034-30 imposes, as of 16th June 2011, class IE2 as a minimum standard for motors.

The Seasonal Performance Factor (SPF) is an additional criterion of heat pump energy performance. The said factor is used to calculate the amount of environmental energy captured by heat pumps (including geothermal pumps) and may be classified as RES according to Directive 28/2009 EU. The factor is given by the following formula:

$$E_{RES} = Q_{usable} * (1-1/SPF)$$

Where:
Q_{usable} = is the total estimated useful heat energy from heat pumps whose SPF value is $SPF > 1.15 * 1/\eta$. The total useful heat energy is the product of the heat output capacity multiplied by the $Q_{usable\ Factor}$ coefficient that provides the indicative block hours per heat pump type and climate.
SPF = the estimated average seasonal performance coefficient of the heat pump type concerned.
n = the ratio of gross electricity production to primary energy consumption for the production of electricity. This average E.U. indicator is based on Eurostat data.

Article 10 of Law 3851/2010/Greek Official Gazette A' 85 transposing the relevant Directive into the Greek legislation stipulates that for the heat pump to produce energy from RES, its seasonal performance factor (SPF) value should be over 3.3.
Recently however, the E.U., attempting to resolve the difficulties related to the definition of total estimated energy considered RES (E_{RES}) and of certain individual factors, has issued a set of guidelines concerning the calculation by the member-states of Q_{usable} and SPF for various heat pump technologies and applications, taking into consideration environmental differences and especially very cold climates (Decision no. C(2013) 1082 establishing the guidelines for Member States on calculating renewable energy from heat pumps from different heat pump technologies pursuant to article 5 of the Directive 2009/28/EU of the European Parliament and of the Council).

The recommended SPF values are provided in the following Table.

Table 2.1.6b: Building Sector – Minimum efficiency (performance coefficient) values per heat pump type

Technology	Hot	Average	Cold	Hot	Average	Cold
Aerothermal energy						
Air - air	2.7	2.6	2.5	1.2	1.2	1.15
Air - water	2.7	2.6	2.5	1.2	1.2	1.15
Air – air (reversible)	2.7	2.6	2.5	1.2	1.2	1.15
Air – water (reversible)	2.7	2.6	2.5	1.2	1.2	1.15
Exit air - air	2.7	2.6	2.5	1.2	1.2	1.15
Exit air - water	2.7	2.6	2.5	1.2	1.2	1.15
Geothermal energy						
Ground - air	3.2	3.2	3.2	1.4	1.4	1.4

Ground - water	3.5	3.5	3.5	1.6	1.6	1.6
Hydrothermal energy						
Water – air	3.2	3.2	3.2	1.4	1.4	1.4
Water - water	3.5	3.5	3.5	1.6	1.6	1.6

2.1.3.2. Boilers – energy class

Directive 1992/42/EC, transposed into the Greek legislation by Presidential Decree 335/93 as modified by Presidential Decree 59/95, determines the efficiency requirements applicable to new hot-water boilers fired by liquid or gaseous fuels with a rated output of no less than 4 kW and no more than 400 kW. According to the aforementioned Directive, boilers must comply with the minimum useful efficiency requirements, while labels with information regarding their energy performance should confirm such compliance with these requirements.

Moreover, boilers must be labelled with the CE mark and accompanied by the EC declaration of conformity, which ensures their conformity to the required efficiency levels.

Last but not least, boilers qualified with an ENERGY STAR label, or equivalent, can be also selected, as long as their efficiency rate is equal to or greater than 85%.

The minimum requirements regarding the energy performance of boilers are provided in the following table:

Table 2.1.7: Minimum boiler energy efficiency requirements

Boiler type	**Power output range (kW)**	**Full-load average boiler water temperature (°C)**	**Full-load efficiency requirement (%)**	**Part-load average boiler water temperature (°C)**	**Part-load efficiency requirement (%)**
Standard boilers	4-400	70	≥84+2.logPn	≥50	≥80+3.logPn
Low temperature boilers	4-400	70	≥87.5+1.5.log Pn	40	≥87.5+1.5.log Pn
Gas condensing boilers	4-400	70	≥91+1.logPn	30	≥97+1.logPn

Pn= Rated power in kW.

2.1.3.3. Split unit / Air conditioners

As regards air conditioners, Directive 2010/30/EC, as transposed by the Joint Ministerial Decree 12400/1108/OG 2301/B/14.10.2011, applies only to split units under 12kW and specifies energy efficiency classes through energy labels. The following parameters play a decisive role in defining a split unit as energy efficient:

- The energy efficiency class for heating and cooling
- The annual electricity consumption for heating and cooling
- The seasonal energy efficiency ratio (SEER)
- The seasonal coefficient of performance (SCOP)

SEER and SCOP values per energy efficiency class are presented in the following two tables:

Table 1.2.8: Building sector – Air conditioner energy efficiency classes (except double duct and single duct air conditioners)

Energy Efficiency class	SEER	SCOP
A+++	SEER ≥ 8.50	SCOP ≥ 5.10
A++	6.10 ≤ SEER < 8.50	4.60 ≤ SCOP < 5.10
A+	5.60 ≤ SEER < 6.10	4.00 ≤ SCOP < 4.60
A	5.10 ≤ SEER < 5.60	3.40 ≤ SCOP < 4.00
B	4.60 ≤ SEER < 5.10	3.10 ≤ SCOP < 3.40
C	4.10 ≤ SEER < 4.60	2.80 ≤ SCOP < 3.10
D	3.60 ≤ SEER < 4.10	2.50 ≤ SCOP < 2.80
E	3.10 ≤ SEER < 3.60	2.20 ≤ SCOP < 2.50
F	2.60 ≤ SEER < 3.10	1.90 ≤ SCOP < 2.20
G	SEER < 2.60	SCOP < 1.90

Table 1.2.8: Building sector – Energy efficiency classes for double duct and single duct air conditioners

Energy Efficiency class	**Double duct air conditioners**		**Single duct air conditioners**	
	EER rated	**COP rated**	**EER rated**	**COP rated**
A	≥ 4.10	≥ 4.60	≥ 4.10	≥ 3.60
A++	3.60 ≤ EER < 4.10	4.10 ≤ COP < 4.60	3.60 ≤ EER < 4.10	3.10 ≤ COP < 3.60
A+	3.10 ≤ EER < 3.60	3.60 ≤ COP < 4.10	3.10 ≤ EER < 3.60	2.60 ≤ COP < 3.10
A	2.60 ≤ EER < 3.10	3.10 ≤ COP < 3.60	2.60 ≤ EER < 3.10	2.30 ≤ COP < 2.60
B	2.40 ≤ EER < 2.60	2.60 ≤ COP < 3.10	2.40 ≤ EER < 2.60	2.00 ≤ COP < 2.30
C	2.10 ≤ EER < 2.40	2.40 ≤ COP < 2.60	2.10 ≤ EER < 2.40	1.80 ≤ COP < 2.00
D	1.80 ≤ EER < 2.10	2.00 ≤ COP < 2.40	1.80 ≤ EER < 2.10	1.60 ≤ COP < 1.80
E	1.60 ≤ EER < 1.80	1.80 ≤ COP < 2.00	1.60 ≤ EER < 1.80	1.40 ≤ COP < 1.60
F	1.40 ≤ EER < 1.60	1.60 ≤ COP < 1.80	1.40 ≤ EER < 1.60	1.20 ≤ COP < 1.40
G	< 1.40	< 1.60	< 1.40	< 1.20

2.2. Office and IT equipment

The following list contains a number of major energy-related aspects to be taken into account in relation to office and IT equipment, such as:
Energy performance (compliance with the most recent Energy Star standards or equivalent certificate demonstrating compliance with Energy Star energy efficiency criteria),
LCD monitor background lighting,
Reparability design,
Upgradability and durability (lifetime extension),
Recyclability and re-usability,
User instructions and / training regarding efficient use and management.

According to EU Green Public Procurement criteria all office IT products must comply with the latest energy efficiency ENERGY STAR standards. More information about the standards is available on the web: www.eu-energystar.org. It is also pointed out that products labelled with type 1 eco-label are considered to fulfil the requested criteria. Any other suitable evidence may also be acceptable, such as a technical dossier by the manufacturer or test reports by a recognized agency

(i.e. agencies accredited to issue test reports according to ISO 17025), demonstrating such criteria fulfilment.
ENERGY STAR label specifications may be modified by a relevant Decision of the European Commission. The latest Energy Star version for computers and monitors is version 5.0.

Table 1.2.9: Office and IT Sector – Energy Performance

Criterion 1	
Objective	Energy performance – Electric energy consumption in Watt (W) (latest Energy Star standards or equivalent certificate)
Performance indicator	on mode, off mode, sleep mode, annual energy consumption
Performance Required	For desktops and laptops, for example, the minimum performance criterion is based on the parameter of Typical Energy Consumption (TEC). $E_{TEC} = (8760/1000)\cdot(P_{Poff}.\cdot T_{Toff} + P_{sleep}.\cdot T_{sleep}.+ P_{standby}.\cdot T_{standby}.)$, ➢ Where Px are power values in watt, Tx are time values expressed as annual percentage rates and ETEC is a value expressed in kWh corresponding to the annual energy consumption based on the Energy Star table weightings.
Assessment method	Energy Star label or equivalent performance certificate. Use low energy consumption products. Replace old energy-hungry IT equipment. Take care of the standby power losses. Energy efficient products should have a sleep mode function and a dim modus function which should start after a few minutes of inactivity.

2.3. Electricity and Lighting

2.3.1. Indoors lighting

The key environmental impact of indoor lighting is energy consumption and associated greenhouse gas emissions. Contrary to other energy intensive products, the highest amount of energy is consumed during the use phase of the lifecycle of lighting products rather than during production, transport, supply and disposal.

Thus, the global potential for energy efficiency through the purchase of lighting products that meet certain energy efficiency criteria during the use phase is high.

The purchase of indoor lighting products should be done carefully in all stages:

2.3.1.1. Design stage:

The design stage can be undertaken either by specialized public sector personnel or externally assigned via a public procurement procedure for indoor lighting design services. In the latter case, it has to be ensured that the design will be undertaken by personnel with experience in lighting design and lighting engineering.

The following aspects should be taken into consideration at this stage:

- The existing lighting installations.
- That new lighting installations have, on the whole, the desired power density to meet visual task requirements.
- That lighting controls are designed to further reduce energy consumption.
- That the use of dimmable ballasts is encouraged where circumstances permit it.
- That voltage changes are accounted for where the phenomenon is common.

- An economic valuation must be carried out in advance, in order to adopt a given solution and take into consideration the total cost both with reference to the purchase and the withdrawal and subsequent management.

2.3.1.2. Purchase stage

The following aspects should be taken into consideration at this stage:
That new or replacement lamps meet certain specifications regarding energy class (efficiency) and lamp life.
That all products to be purchased are accompanied by quality certificates and support documents.

2.3.1.3. Installation stage

The following aspects should be taken into consideration at this stage:

- That the installation personnel has adequate experience in lighting system installation and a suitable professional qualification in electrical or building services engineering,
- That the installed system works as intended, in an energy efficient way,
- As regards replacements, that new lamps can be adapted to the existing infrastructure.

In particular, various bodies, including the European Commission, have developed detailed criteria for each stage of the procurement procedure of indoor lighting products. The purpose of the said criteria is to guide the author of the notice to effectively implement energy efficiency criteria. The aforementioned criteria may include the following:

- Lamps should have a specified luminous and energy efficacy depending on their power,
- Lamps should belong to a specified energy class (per type),
- Replacement lamps for existing installations should have a lamp luminous efficacy equal to or greater than the minimum efficacy of the relevant energy class,
- Lamps for new and renovated installations and replacement lamps in existing installations should have a long lifetime,
- Compact fluorescent lamps should be purchased under consideration of the number of switches (on/off) before failure,
- As regards indoor lighting installations, one of the aspects to be taken into account is the total lighting power consumed in the building as a whole, divided by the total floor area in W/m^2, as well as the maximum lighting power consumed in indoor spaces divided by the total area and luminance in 100 lux units (W/m^2/100lux),
- The assembler should be an experienced technician,
- A calculation should be provided by the lighting designer showing the total power consumed by lighting appliances, including lamps, ballasts, sensors and controls, divided by the total floor area of all the indoor spaces in the building,
- The design and installation of lighting controls should be ensured,
- The use of dimmable lightning, time switches, daylight and/or occupancy sensors should be included in the design,
- Information and training of the users is a must (e.g. disassembly instructions, instructions on how to operate and maintain lighting controls, occupancy sensors, etc.),
- The contractor shall ensure that lighting equipment has been installed exactly as specified in the original design,

The following tables contain a number of indicative criteria that may be used in the procurement procedure of indoor lighting products/services. Such criteria comply with EU Green Public Procurement criteria.

Table 1.2. 10: Electricity and Lighting sector – Electric lamp energy efficiency

<table>
<tr><th colspan="2">Criterion 1</th></tr>
<tr><td>Objective</td><td>Electric lamp energy efficiency</td></tr>
<tr><td>Performance indicator</td><td>Applicable energy class</td></tr>
<tr><td>Performance Required</td><td>Replacement lamps for existing installations should have a luminous efficacy equal to or greater than the minimum efficacy of the relevant energy class (see table below):
<table>
<tr><th>Lamp type</th><th>Applicable energy class</th></tr>
<tr><td>Halogen lamps</td><td>C</td></tr>
<tr><td>Fluorescent lamps without integrated ballast</td><td>B</td></tr>
<tr><td>Compact fluorescent lamps (round, pear-shaped, mirror-type or chandelier-type with integrated ballast)</td><td>B</td></tr>
<tr><td>All lamps except halogen lamps with colour rendering index (CRI) Ra>=90</td><td>B</td></tr>
<tr><td>All other compact lamps with integrated ballast</td><td>A</td></tr>
<tr><td>Tubular fluorescent lamps 15W T8 and miniature tubular fluorescent lamps</td><td>B</td></tr>
<tr><td>Circular lamps</td><td>B</td></tr>
<tr><td>Other tubular lamps</td><td>A</td></tr>
<tr><td>All other lamps including LED and discharge lamps</td><td>A</td></tr>
</table>
Replacement lamps for new and existing installations should have a luminous efficacy equal to or greater than the minimum efficacy of the relevant energy class (see table below):
<table>
<tr><td>Lamp type</td><td>Applicable energy class</td></tr>
<tr><td>All halogen lamps with CRI Ra>=90 (where required by indoor activities)</td><td>B</td></tr>
<tr><td>All other lamps</td><td>A</td></tr>
</table></td></tr>
<tr><td>Assessment method</td><td>Lamp label of the specified energy class or better, or other documented evidence (e.g. manufacturer’s statement, other certification)</td></tr>
</table>

Table 1.2.11: Electricity and Lighting sector – Economic lifetime

<table>
<tr><th colspan="2">Criterion 2</th></tr>
<tr><td>Objective</td><td>Economic life time</td></tr>
<tr><td>Performance indicator</td><td>Lamp life (in hours)</td></tr>
<tr><td>Performance Required</td><td>The life of lamps for new and renovated installations should exceed the minimum lifetime specified in the following table:
<table>
<tr><th>Lamp type</th><th>Lamp life (in hours)</th></tr>
<tr><td>Halogen lamps</td><td>2000</td></tr>
<tr><td>Compact fluorescent lamps (round, pear-shaped, mirror-type or chandelier-type)</td><td>6000</td></tr>
<tr><td>All other compact fluorescent lamps</td><td>10000</td></tr>
<tr><td>Circular lamps</td><td>7500</td></tr>
<tr><td>T8 tubular fluorescent lamps with electromagnetic</td><td>15000</td></tr>
</table></td></tr>
</table>

	ballasts (existing installations only)	
	Other tubular lamps	20000
	Non-directional high intensity discharge lamps (primary combustion)	12000
	Directional high intensity discharge lamps (primary combustion)	9000
	LED spotlights used for upgrading with integrated mode switch	15000
	Other LED spotlights	20000
Assessment method	Products labelled with type I eco-labels are considered compliant on condition that the relevant label fulfils the requirements mentioned above. Other appropriate evidence is acceptable, i.e. lamp life test results based on EN 50285 test procedures (except for high intensity discharge lamps) or other equivalent standards.	

2.3.2. Street lighting

The key environmental impact of street lighting and traffic signals is energy consumption and the associated greenhouse gas emissions.

The main principles to be followed in order to limit the above impact are:

- As in the case of indoor lighting, all the stages of the purchase of street lighting products (design, supply and installation of the equipment) should be approached with particular care.
- The design and installation of street lighting should respect the same principles as indoor lighting.
- The criteria selected for the procurement of lighting products/services should address energy efficiency issues related to the whole lighting fixture (i.e. luminaries, ballast, controls, sensors, etc.) and not only of the lamps.

Moreover, the following criteria should be taken into consideration in the purchase of street lighting products:

- The lamp efficacy of lighting equipment is based on the lamp type (e.g. high pressure sodium, metal halide, etc).
- The ballasts should meet specific energy efficiency rates. The purchase of low energy consumption lighting systems (in relation to the light provided) should be promoted.
- The use of LEDs in street lighting and traffic signals should be promoted, considering that recent LED technology advances have enabled their integration in various demanding applications. Some of the advantages of LEDs are high energy efficiency, high lighting quality and visual comfort, long lifetime, low maintenance requirements and many customized control possibilities. The purchase of LED lighting products should be done under consideration of eco-design requirements and the relevant guidelines (e.g. Commission Regulation 1194/2012).
- Where circumstances permit it, the use of dimmable ballasts should be encouraged.
- The use of luminaries that limit the emission of light above the horizon should be promoted.
- Care should be taken to purchase lamps with high lamp lumen maintenance factors (LLMF) and lamp survival factors (LSF).
- All purchased products should be accompanied by quality certificates or other support documents.

- The design of integrated lighting systems that include controls, such as daylight linked controls, lighting management software and wireless control panel, should be promoted.

Table 1.2.12: Electricity/Lighting Sector – Energy Efficiency of electric bulbs (outdoor)

<table>
<tr><th colspan="2">Criterion 1</th></tr>
<tr><td>Objective</td><td>Energy efficiency of electric bulbs</td></tr>
<tr><td>Performance Indicator</td><td>Estimated Efficiency of electric bulb (lm/W)</td></tr>
<tr><td>Performance Required</td><td>Luminous efficacy of the lamp should be equal to or greater than the minimum efficacy of the lamp class and the relevant wattage range according to the following:

For high pressure sodium lamps (Ra<60):

<table>
<tr><th>Nominal lamp wattage (W)</th><th>Rated lamp efficacy (lm/W) - Clear</th><th>Rated lamp efficacy (lm/W) - Coated</th></tr>
<tr><td>W ≤ 45</td><td>≥ 62</td><td>≥ 60</td></tr>
<tr><td>45 < W ≤ 55</td><td>≥ 80</td><td>≥ 70</td></tr>
<tr><td>55 < W ≤ 75</td><td>≥ 91</td><td>≥ 82</td></tr>
<tr><td>75 < W ≤ 105</td><td>≥ 105</td><td>≥ 95</td></tr>
<tr><td>105 < W ≤ 155</td><td>≥ 114</td><td>≥ 107</td></tr>
<tr><td>155 < W ≤ 255</td><td>≥ 125</td><td>≥ 120</td></tr>
<tr><td>255 < W</td><td>≥ 138</td><td>≥ 133</td></tr>
</table>

For Metal Halide lamps (Ra<80)

<table>
<tr><th>Nominal lamp wattage (W)</th><th>Rated lamp efficacy (lm/W) - Clear</th><th>Rated lamp efficacy (lm/W) - Coated</th></tr>
<tr><td>W ≤ 55</td><td>≥ 85</td><td>≥ 80</td></tr>
<tr><td>55 < W ≤ 75</td><td>≥ 100</td><td>≥ 85</td></tr>
<tr><td>75 < W ≤ 105</td><td>≥ 105</td><td>≥ 90</td></tr>
<tr><td>105 < W ≤ 155</td><td>≥ 110</td><td>≥ 95</td></tr>
<tr><td>155 < W ≤ 255</td><td>≥ 100</td><td>≥ 92</td></tr>
<tr><td>255 < W</td><td>≥ 92</td><td>≥ 100</td></tr>
</table>

For Metal Halide lamps (Ra≥80)

<table>
<tr><th>Nominal lamp wattage (W)</th><th>Rated lamp efficacy (lm/W) - Clear</th><th>Rated lamp efficacy (lm/W) - Coated</th></tr>
<tr><td>W ≤ 55</td><td>≥ 85</td><td>≥ 65</td></tr>
</table>
</td></tr>
</table>

Criterion 1			
	55 < W ≤ 75	≥ 94	≥ 70
	75 < W ≤ 105	≥ 95	≥ 75
	105 < W ≤ 155	≥ 96	≥ 75
	155 < W ≤ 255	≥ 97	≥ 80
	255 < W	≥ 98	≥ 80
Computation Method	Verification of Technical Specifications		

2.4. Transport

The sector of transport accounts for approximately one third of the energy consumption and was the greater end energy consumer in 2008, followed by industry and households. Therefore, energy saving is particularly crucial in the transport sector. For such a high energy consumption to be reduced, key criteria should be applied in the procedures put in place for the supply of vehicles and alternatives, like driving with or selection of the appropriate tires for energy saving vehicles or even car tires, should be considered.

2.4.1. Supply of vehicles

The easiest way to achieve energy efficiency and guarantee the appropriate emission limits of the vehicles supplied, is the use of European standards. Besides, should the market and the relevant cost allow it, the ideal would be to opt for electric-powered vehicles. The adoption of such a measure could really achieve a market shift.

The main legislation on vehicles stems from European Directive 2009/33/EC and its transposition into national legislation with Law 3982 of 2011, Part 4. Under article 69 of the Law on the purchase of clean and energy efficient road transport vehicles (article 5, Directive 2009/33/EC), the following is stipulated:

- The contracting authorities, contracting operators and enterprises mentioned in article 66, when proceeding to the purchase of road transport vehicles, take into account the impact of the operational energy consumption and the environmental impact during the whole life of the vehicle (according to the methods described in other paragraphs of the Law).
- The operational energy and environmental impacts that should be taken into consideration, include at least the following:
  - energy consumption,
  - CO_2 emissions,
  - NO_x, NMHC emissions and suspended particulate matter.

The methodology according to which the operational lifetime energy consumption cost of the vehicle is calculated, is thoroughly described in the Law, whereas the annex provides the necessary data for its computation, namely the following:

Table 1: Fuel energy content

Fuel	Energy content
Diesel	36 MJ/lt
Petrol	32 MJ/lt
Natural gas/Biogas	33−38 MJ/Nm3
LPG	24 MJ/lt
Ethanol	21 MJ/lt
Biodiesel	33 MJ/lt
Fuel emulsions	32 MJ/lt
Hydrogen	11 MJ/Nm3

Table 2: Emission cost in road transport (2007 values)

CO2	NOx	NMHC	Suspended particulate matter
0.03−0.04EUR/kg	0.0044 EUR/g	0.001 EUR/g	0.087 EUR/g

Table 3: Kilometres travelled during the lifetime of road transport vehicles

Vehicle Class	Lifetime kilometers travelled
Passenger vehicles (M1)	200000 Km
Light-duty commercial vehicles (N1)	250000 Km
Heavy-duty commercial vehicles (N2, N3)	1000000 Km
Buses (M2, M3)	800000 Km

2.4.2. Other approaches in the field transport

There are additional vital ways to save energy and reduce CO_2 emissions in the sector of transport, including:

- Selection of vehicles using alternative fuels or bio-fuels, rather than fossil fuels.
- Establishment of measures and dissemination of information on the preferential use of driving styles (eco-driving) which do not entail considerable cost and, if combined with appropriate training, constitute an effective way to reduce fuel consumption.
- Implementation of tire pressure control systems and gear change indicators.
- Use of recycled lubricants.
- Use of low rolling resistance tires.

2.4.3. Tire labels

Since November 1st, 2012 the European Regulation No. 1222/2009 on the labeling of tires with reference to fuel savings and other substantial parameters has been in force . Tires are responsible, mainly because of the rolling resistance, for 20% to 30% of the fuel consumption in vehicles, as a result of which the reduction of the tire rolling resistance may considerably promote the energy efficiency of road transport and, by consequence, the reduction of emissions.

The Regulation aims, amongst other things, to improve the road transport efficiency by promoting fuel-saving and safe tires. Furthermore it sets the framework for the provision of harmonized information with regard to the criteria related to tires through labeling, enabling consumers to make documented choices when purchasing tires.

Labeling provides information, inter alia, on the level of fuel saving and wet grip. This information is collected through harmonized trial methods, described below:

GRADING OF TIRE PARAMETERS

Part A : Fuel efficiency classes.

The fuel efficiency class must be determined on the basis of the rolling resistance coefficient (RRC) according to the "A" to "G" scale specified below and measured in accordance with UNECE Regulation No 117 and its subsequent amendments.

If a tire type is approved for more than one tire class (e.g. C1 and C2), the grading scale used to determine the fuel efficiency class of this tire type should be that which is applicable to the highest tyre class (e.g. C2, not C1).

C1 Tires		C2 Tires		C3 Tires	
RRC in kg/t	Energy efficiency class	RRC in kg/t	Energy efficiency class	RRC in kg/t	Energy efficiency class
RRC≤ 6.5	A	RRC≤ 5.5	A	RRC≤ 4.0	A
6.6 ≤RRC≤ 7.7	B	5.6 ≤RRC≤ 6.7	B	4.1 ≤RRC≤ 5.0	B
7.8 ≤RRC≤ 9.0	C	6.8 ≤RRC≤ 8.0	C	5,1 ≤RRC≤ 6.0	C
Empty	D	Empty	D	6.1 ≤RRC≤ 7.0	D
9.1 ≤RRC≤ 10.5	E	8.1 ≤RRC≤ 9.2	E	7.1 ≤RRC≤ 8.0	E
10.6≤RRC≤ 12	F	9.3 ≤RRC≤ 10.5	F	RRC ≥ 8.1	F
RRC≤ 12.1	G	RRC≤ 10.6	G	Empty	G

Part B: Wet grip classes.

The wet grip class of C1 tires must be determined on the basis of the wet grip index (G) according to the "A" to "G" scale specified below and measured in accordance with UNECE Regulation No 117 and its subsequent amendments.

G	Wet grip class
1.55 ≤G	A
1.40 ≤G≤ 1.54	B
1.25 ≤G≤ 1.39	C
Empty	D
1.10 ≤G≤ 1.24	E
G≤ 1.09	F
Empty	G

3. PART 3: REFERENCES - CONTRIBUTIONS

3.1 Sources - References

EFFECT Project

- Transnational EEPP Procedures Catalogue
- EEPP Recommendation Paper
- Index for Demand Side Swot Analysis
- Common Criteria

3.2 Contributions

Network of Sustainable Aegean Islands - DAFNI

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North Aegean Region

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- Anastasios Georgantis (North Aegean Region)

4. PART 4: USEFUL LINKS

4.1. European legislation

Directive/Regulation	Directive 2004/18/EC
Object	On the coordination of the procedures for the award of public works contracts, public supply contracts and public service contracts
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2004L0018:20080101:EL:PDF

Directive/Regulation	Directive 2004/17/EC
Object	Coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2004L0017:20080101:EL:PDF

Directive/Regulation	Directive 2012/27/EC
Object	On energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:315:0001:0056:EL:PDF

Directive/Regulation	Directive 2006/32/EC
Object	On energy end-use efficiency and energy services and repealing Council Directive 93/76/EEC
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:114:0064:0064:EL:PDF

Directive/Regulation	Directive 2009/125/EC
Object	Establishing a framework for the setting of ecodesign requirements for energy-related products
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:285:0010:0035:EL:PDF

Directive/Regulation	Directive 2010/30/EU
Object	On the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:153:0001:0012:EL:PDF

Directive/Regulation	Directive 2010/31/EU
Object	On the energy performance of buildings
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:153:0013:0035:EL:PDF

Directive/Regulation	Directive 33/2009//EC
Object	On the promotion of clean and energy-efficient road transport vehicles
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:120:0005:0012:EL:PDF

Directive/Regulation	Regulation (EC) No. 1222/2009 (Updates through Regulations 2011/228/EC, 2011/1235/EC).
Object	On the labelling of tyres with respect to fuel efficiency and other essential parameters
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:342:0046:0058:EL:PDF

Directive/Regulation	Regulation (EC) No. 106/2008 (Updates through Regulations 2009/789/EC, 2009/489/EC, 2009/347/EC).
Object	On a Community energy-efficiency labelling programme for office equipment (recast version)
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:039:0001:01:el:HTML

Directive/Regulation	Directive 89/106/EEC
Object	On the approximation of laws, regulations and administrative provisions of the Member States relating to construction products.
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31989L0106:el:HTML

Directive/Regulation	Regulation 305/2011/EU
Object	Laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:088:0005:0043:EL:PDF

Directive/Regulation	Regulation 641/2009/EC
Object	Implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:191:0035:0041:EL:PDF

Directive/Regulation	Directive 32/2005/EC
Object	Establishing a framework for the setting of ecodesign requirements for energy-using products and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC of the European Parliament and of the Council
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:191:0029:0029:EL:PDF

Directive/Regulation	Regulation 1194/2012/EC
Object	Implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for directional lamps, light emitting diode lamps and related equipment
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:342:0001:0022:EL:PDF

Directive/Regulation	Regulation 1222/2009/EC
Object	On the labelling of tyres with respect to fuel efficiency and other essential parameters
Website	http://eur-

	lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:342:0046:0058:EL:PDF

Directive/Regulation	UNECE Regulation No 117
Object	On tyre rolling sound emissions and adhesion on wet surface and/or to rolling resistance
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:307:0003:0063:EL:PDF

Directive/Regulation	Regulation (EU) No. 626/2011 της Επιτροπής της 4ης Μαΐου 2011
Object	Supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of air conditioners
Website	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:072:0007:0027:EL:PDF

4.2. Greek Legislation

Law/Decree	Presidential Decree 60/2007, Hamonization of the Greek legislation with the provisions of Directive 2004/18/EC
Object	On the coordination of the procedures for the award of public works contracts, public supply contracts and public service contracts, as amended by Directive 2005/51/EC of the Commission and Directive 2005/75/EC of the European Parliament and the Council of 16 November 2005.
Source	Greek Official Gazette, Issue 1, No. 64/17/03/2007
Website	http://www.epdm.gr/Uploads/Files/files_for_content/pd60.pdf

Law/Decree	Presidential Decree 59/2007, Hamonization of the Greek legislation with the provisions of Directive 2004/17/EC
Object	Coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors, as amended and integrated.
Source	Greek Official Gazette, Issue 1, No. 63/16/03/2007
Website	http://www.ggea.gr/documents/vivliothiki/p_d/PD59_07.pdf

Law/Decree	Joint Ministerial Decree Δ6/B/14826
Object	Measures for the improvement of energy efficiency and energy saving in the public and wider public sector
Source	Greek Official Gazette, Issue 2, No. 1122/17/06/2008
Website	http://www.aegean-energy.gr/gr/pdf/nomoi/kya_14826.pdf

Law/Decree	Law 3855, Transposition of Directive 32/2006/EC
Object	Measures for the improvement of the energy end-use efficiency and energy services and other provisions.
Source	Greek Official Gazette, Issue 1, No. 95/23/06/2010
Website	http://www.ypeka.gr/LinkClick.aspx?fileticket=AxgQsUVAUjA%3D&tabid=533

Law/Decree	Law 3661/2008
Object	Measures for the reduction of energy consumption in buildings and other provisions.
Source	Greek Official Gazette, Issue 1, No. 89/19/05/2008
Website	http://www.ypeka.gr/LinkClick.aspx?fileticket=yJy1TVyRqoo%3d&tabid=338&language=el-GR

Law/Decree	Law 3982, Part 4, Hamonization with Directive 2009/33/EC/23/04/2009
Object	Promotion of clean and energy efficient vehicles for special transport
Source	Greek Official Gazette, Issue 1, No. 143/17/06/2011
Website	http://www.startupgreece.gov.gr/sites/default/files/%20%CE%91%20143_%CE%9D3982_17062011_1.PDF

Law/Decree	Joint Ministerial Decree Δ6/Β/οικ. 5825
Object	Approval of the Energy Efficiency Regulation for buildings
Source	Greek Official Gazette, Issue 2, No. 407/09/04/2010
Website	http://www.ypeka.gr/LinkClick.aspx?fileticket=u2VM2IzaXIc%3D&tabid=508

Law/Decree	Circular ec. 1603/4.10.2010
Object	Implementation of the Energy Efficiency Regulation for buildings (K.EN.A.K)
Source	Ministry of Environment, Energy and Climate Change.
Website	http://www.ypeka.gr/LinkClick.aspx?fileticket=29ttxP%2b58fw%3d&tabid=508&language=el-GR

Law/Decree	Ministerial Decree 49731, Amendment of Article 25 of the Decree No. 3046/304/89 by the Deputy Minister of Environment, Physical Planning and Public Works (Greek Official Gazette, No. Δ΄59)
Object	On the Building Regulation
Source	Greek Official Gazette, No. 498/23/11/2010
Website	http://www.ypeka.gr/LinkClick.aspx?fileticket=Z7%2fYp0BdLTg%3d&tabid=508&language=el-GR

Law/Decree	Presidential Decree 7/2011, compliance with Directive 2009/125/EC and amendment of Presidential Decree 32/2010
Object	Definition of ecological planning requirements with reference to energy-related products, in compliance with Directive 2009/125/EC and amendment of Presidential Decree 32/2010
Source	Greek Official Gazette, Issue 1 , No. 14/11/02/2011
Website	http://nomoi.info/%CE%A6%CE%95%CE%9A-%CE%91-14-2011.html

Law/Decree	Law 4122/2013, Harmonization with Directive 2010/31/EU
Object	Energy Efficiency for buildings
Source	Greek Official Gazette, Issue 1, No. 42/19/02/2013
Website	http://www.buildingcert.gr/N4122_2013.pdf

Law/Decree	Joint Ministerial Decree 12400/1108/, Harmonization of Greek legislation with Directive 2010/30/EE
Object	On the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products
Source	Law Database
Website	http://www.dsanet.gr/Epikairothta/Nomothesia/ya12400_11.htm

Law/Decree	Law 3851/2010
Object	Acceleration of the development of Renewable Energy Sources for addressing climate change and other provisions in matters falling within the competence of the Ministry of Environment, Energy and Climate Change.
Source	Greek Official Gazette, Issue 1, No. 85/04/06/2010
Website	http://www.ypeka.gr/LinkClick.aspx?fileticket=pnhppGnURds%3D

Law/Decree	Ministerial Decree 11389 / 1993
Object	Single Procurement Regulation for the Local Authorities (Ε.Κ.Π.Ο.Τ.Α.)
Source	E.E.T.A.A.
Website	http://www.eetaa.gr:8080/kodikas/nm_ptext.jsp?nkey=44&akey=209

Law/Decree	Law 3889/2010
Object	Financing of Environmental Interventions, Green Fund, Ratification of Forest Maps and other provisions.
Source	Greek Official Gazette, Issue 1, No. 182/14/10/2010
Website	http://www.ypeka.gr/LinkClick.aspx?fileticket=h1wqDS%2FNDHg%3D

4.3. European links/tools

Title	SMART SPP
Object	LCC-CO2 Tool user guide
Creator	PROCURA+, European Commission, Intelligent Energy
Website	http://www.smart-spp.eu/fileadmin/template/projects/smart_spp/files/Guidance/En_SMARTSPP_LCC_CO2_Tool_User_Guide_FINAL.pdf http://www.smart-spp.eu/fileadmin/template/projects/smart_spp/files/Guidance/Final_versions/EN_SMART_SPP_Tool_User_Guide_2011_FINAL.pdf

Title	GPP Criteria
Object	GPP Training Toolkit
Creator	European Commission, Environment
Website	http://ec.europa.eu/environment/gpp/toolkit_en.htm

Title	Product bulletin – Thermal insulation
Object	Thermal insulation criteria
Creator	European Commission
Website	http://ec.europa.eu/environment/gpp/pdf/criteria/insulation/el.pdf

Title	Green Public Procurement (GPP) Product bulletin
Object	Construction
Creator	European Commission
Website	http://ec.europa.eu/environment/gpp/pdf/toolkit/construction_GPP_product_sheet_el.pdf

Title	EU GPP Criteria
Object	Electricity criteria
Creator	European Commission
Website	http://ec.europa.eu/environment/gpp/pdf/criteria/electricity.pdf

Title	EU GPP Criteria
Object	Indoor lighting criteria
Creator	European Commission
Website	http://ec.europa.eu/environment/gpp/pdf/Indoor%20Lighting%20-%20EU%20GPP%20Criteria%20Final%20draft.pdf

Title	EU GPP Criteria
Object	Office equipment criteria
Creator	European Commission
Website	http://ec.europa.eu/environment/gpp/pdf/criteria/office_it_equipment.pdf

Title	EU GPP Criteria
Object	Street lighting and traffic signals criteria
Creator	European Commission
Website	http://ec.europa.eu/environment/gpp/pdf/criteria/street_lighting.pdf

Title	EU GPP Criteria
Object	transport criteria
Creator	European Commission
Website	http://ec.europa.eu/environment/gpp/pdf/criteria/transport.pdf

Title	GPP Training Toolkit, Module 1: Managing GPP Implementation
Object	European Ecolabel
Creator	European Commission, Environment
Website	http://ec.europa.eu/environment/gpp/pdf/toolkit/module1_factsheet_ecolabels.pdf

Title	GPP Training Toolkit, Module 1: Managing GPP Implementation
Object	GPP and Environmental Management Systems
Creator	European Commission, Environment

Website	http://ec.europa.eu/environment/gpp/pdf/toolkit/module1_factsheet_gpp_and_ems.pdf

Title	GPP Training Toolkit, Module 1: Managing GPP Implementation
Object	GPP Policy
Creator	European Commission, Environment
Website	http://ec.europa.eu/environment/gpp/pdf/toolkit/module1_factsheet_gpp_policy.pdf

4.4. European links in Greek

Title	Green Public Procurement (GPP) Product bulletin
Object	GPP Electricity
Creator	European Commission, Environment, Ministry of Environment, Energy and Climate Change
Website	http://www.ypeka.gr/LinkClick.aspx?fileticket=VhoxU77vdUo%3D&tabid=533

Title	Product bulletin for Green Public Procurement (GPP)
Object	Thermal Insulation
Creator	European Commission, Environment, Ministry of Environment, Energy and Climate Change
Website	http://ec.europa.eu/environment/gpp/pdf/criteria/insulation/el.pdf

Title	Green Public Procurement (GPP) Product bulletin
Object	Green Public Procurement (GPP) on transport
Creator	European Commission, Environment, Ministry of Environment, Energy and Climate Change
Website	http://www.ypeka.gr/LinkClick.aspx?fileticket=p4%2BIEOngIjA%3D&tabid=533

Title	Introduction to the GPP
Object	Training toolkit for GPP
Creator	European Commission, Ministry of Environment, Energy and Climate Change
Website	http://www.ypeka.gr/LinkClick.aspx?fileticket=GuDnCq6Sld4%3d&tabid=533

Title	Procura +
Object	A guide for Sustainable and Advantageous Public Procurement
Creator	ICLEI , Procura +
Website	http://www.procuraplus.org/fileadmin/files/Manuals/Greek_Manual/Procura__Manual_complete_greek1.pdf

Title	Manual
Object	Common Green Procurement
Creator	European Commission, Intelligent Energy
Website	http://www.pro-ee.eu/fileadmin/pro_ee/inhalte/dokumente/PROEE_Manual_gr.pdf

4.5. Greek links

Title	Green Public Procurement (GPP)
Object	A strong tool for the promotion of Green Development
Creator	Ministry of Environment, Energy and Climate Change
Website	http://www.ypeka.gr/Default.aspx?tabid=533

Title	Covenant of Mayors
Object	Commitment of the EU Mayors to reduce by 20% CO^2 emissions by 2020.
Creator	EU
Website	http://www.simfonodimarxon.eu/index_el.html

Title	Pact of Islands

Object	Pact of Islands for the reduction of emissions and Sustainable actions
Creator	Pact of Islands
Website	http://www.islepact.eu/html/index.aspx?pageid=1020&langID=4

4.6. Other useful links

- EFFECT Project (www.effectproject.eu)
- South East Europe Programme (www.southeast-europe.net)
- ΥΠΕΚΑ-Ministry of Environment, Energy and Climate Change

  http://www.ypeka.gr/Default.aspx?tabid=533
- ΥΠΕΚΑ- Special Secretariat responsible for Environmental and Energy Inspections (http://www.ypeka.gr/Default.aspx?tabid=229&language=el-GR)
- ΥΠΕΚΑ- Special Service of Energy Inspectors (ΕΥΕΠΕΝ) (http://www.ypeka.gr/Default.aspx?tabid=339&language=el-GR)
- PROCURA PLUS + : (http://www.procuraplus.org)
- Network of Aegean Islands for Sustainability DAFNI (http://www.dafni.net.gr/gr/home.htm)
- Region of North Aegean: http://www.pvaigaiou.gov.gr/web/guest/home
- CRES: http://www.cres.gr/kape/index_gr.htm
- EPTA: http://www.epta.gr/