

GREECE
IMPACT, COMPLIANCE AND CONTROL OF EPBD
LEGISLATION



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- **In Greece there was no specific regulation concerning the assessment of energy performance and certification of buildings until the Energy Performance of Buildings Directive (EPBD)**
- **Pre-existing relevant regulations have been:**
 - the Greek Thermal Regulation, implemented in 1981, which prescribed limits for U-values and restricted heat transfer through the building envelope,
 - the Technical Codes of the Technical Chamber of Greece (TOTEI): 2421/86 for the installation of boilers for the heating of buildings, 2423/86 for the installation of cooling systems in buildings and 2425/86 for the calculation of cooling loads in buildings.
- **In 2008, the Greek Law 3661/2008 ‘Measures for decreasing the energy consumption of buildings’ was voted, according to which the Energy Performance Regulation for Buildings (KENAK) is foreseen.**



The Energy Performance Regulation for Buildings

- is going to be implemented during 2009
- it refers to the energy performance of new buildings, as well as existing buildings under specific conditions

The new regulation defines the methodology for the calculation of the energy consumption of buildings, sets the minimum energy performance requirements and prescribes the issue of an energy performance certificate, the inspection of boilers and air-conditioning systems and the implementation of a national body of energy inspectors, in compliance with the European Directive 2002/91/EC.



Impact of EPBD on the national requirements



Main changes are:

- the introduction, for the first time, of the energy performance certificate,
- the definition of specific energy performance levels,
- the definition of specifications for different building systems,
- the consideration of renewables in buildings above 1.000 m²



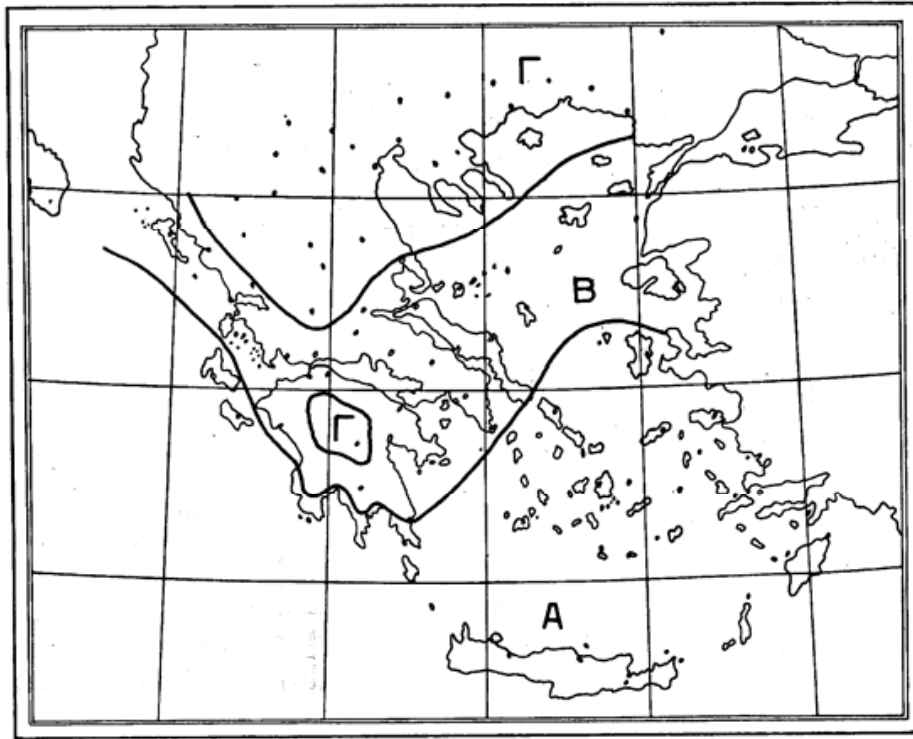


Figure 1: climatic zones according to the existing thermal insulation regulation of 1979

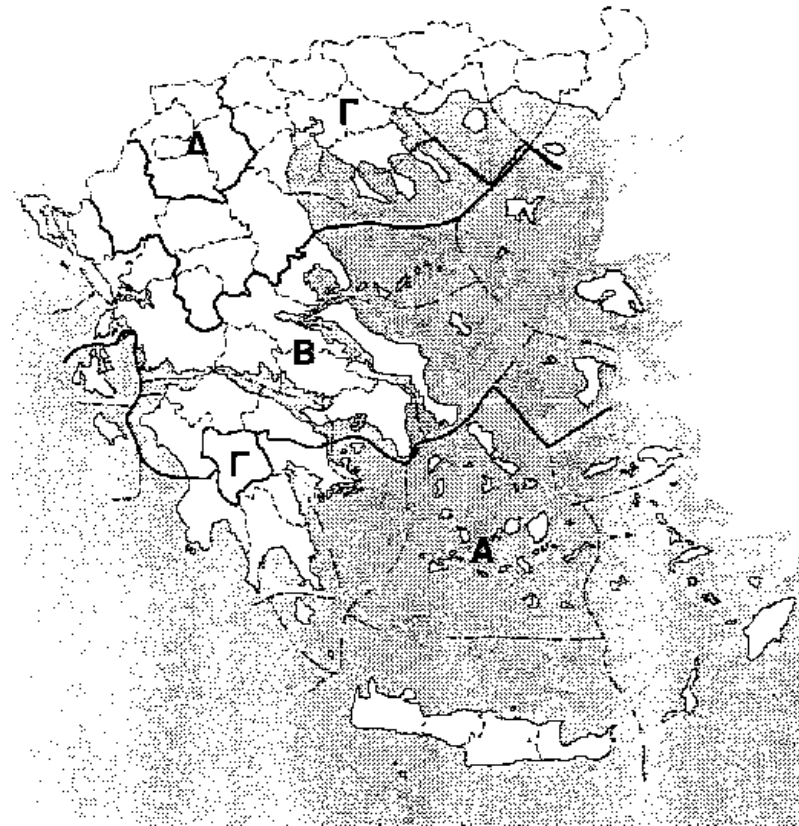


Figure 2: climatic zones according to the new energy performance regulation (KENAK)



Although implementation has not yet started, already some technical measures for better energy performance of buildings are being taken. These are:

- better thermal insulation
- use of double-glazing systems
- passive cooling techniques (night ventilation, solar shading etc.)



New products promoting energy efficiency in buildings have been launched:

- new insulation materials
- new types of glazing
- pv systems and solar thermal
- cool materials
- other building products, which contribute to a better energy performance of buildings

It is expected that the owners of the better energy performing buildings will be able to demand higher prices for them, since their performance means that lower running costs are expected. Conversely, owners of poorly performing buildings will have to lower prices, or invest in improving their performance, in order to make them attractive.



There were already minimum ventilation requirements set by national legislation in Greece. However, in the new regulation, the audit of the air-conditioning system includes the audit of the ventilation system as well.

According to the new regulation KENAK, the reference building is naturally ventilated. The ventilation requirements for buildings set by KENAK are differentiating according to the use and type of building. For tertiary buildings, or buildings with mechanical ventilation, the ventilation system of the reference building should have the following prerequisites:

- ventilation according to the maximum expected number of people and the minimum quantity of air per person
- mechanical ventilation system is included by heat exchanger with a heat recovery coefficient $nR=0,6$
- for the reference building the absorption power is set at 1,0 kW(m³/s)



- ❖ No obligation to use renewable energy in buildings
- ❖ The objective of the Greek Government is to increase the use of renewable energy resources by 20% until 2010*
- ❖ Initiatives to promote the use of renewable energy:
 - **Law 3468/2006 on the electricity production from renewable energy sources and cogeneration**
 - **Financial and practical incentives to stimulate the installation of photovoltaics to the buildings by simplifying the installation procedures**
 - the pv installation up to 10 kWp can be realised with a small permission of works by the Ministry of Environment, Physical Planning and Public Works. This is a motive for citizens to install pv on their roofs without being involved in very time-consuming and costly procedures.
 - **Use of solar collectors**
 - It appears in Greece from 1980. The wide use of solar collectors is due to tax incentives set by the Greek Government in the past. According to the new regulation, solar collectors should cover a specific percentage of the yearly thermal loads due to domestic hot water consumption. This percentage depends on the climate zone and the possibility of installation of a solar collector on the roof of the building.



Compliance and Control of legislation



With the implementation of the EPBD the definition of energy inspector and energy expert is being officially introduced for the first time in Greece. The energy experts will be an independent group under Governmental supervision.*

There will be a register of energy experts controlled by a national authorised Service. All experts should be registered and should obtain a permission in order to carry out energy audits.

The permissions will be categorised by the type of energy audits each expert will be authorised to carry out. Specifically, there will be two main categories of permissions:

- category A concerns audits of buildings with a total area less than 1000m²,
- category B concerns audits of buildings of any total area (including areas exceeding the 1000m²

Three subcategories will define the work field for each expert: **energy expert of buildings**, **energy experts of boilers and heating systems**, **energy experts of cooling systems**.**



The energy regulation KENAK, will enforce the compilation of an Energy Performance Study before construction. The Energy Performance Study:

- will be obligatory for the approval of a building permit
- will be a study of the energy characteristics of the building, additional to architectural, physical planning, heating, cooling, domestic hot water and lighting studies
- will substitute the thermal insulation regulation (3661/2008 art.3). All calculations related to the thermal insulation of the building envelop will be part of the Energy Performance Study

The Study will be obligatory for new buildings and existing buildings >1000m² when being renovated and will be submitted to the authorities responsible for the building permit. The relevant Town Planning Authority is responsible for approval of the building permit and, by extension, for approving the energy study.



- ❖ The checks of compliance of new buildings with the EP requirements will be performed by the energy consultants who also issue the energy certificate
- ❖ The energy performance of a building is proved after the completion of its construction. If a new or an existing building $>1000\text{m}^2$ which undergoes major renovation, is not classified as at least category B, this building will be assessed as illegal construction. An illegal construction has to be upgraded to comply with the minimum requirements,

Energy experts will be:

- responsible also for compliance checks
- will be consisted by a large number of engineers or experts from other scientific fields related to energy aspects
- will carry out the audits
- will issue the certification

Energy experts should follow a training session in order to achieve the right to realize energy audits. Existing authorities responsible for checks or compliance (like f.e. the Town Planning authorities), may need some upgrading of expertise and personnel in order to meet the new expectations.



Control

- There will be a responsible Institution who will control the process and the quality of energy audits
- The Institution will inform and collaborate with the Consultative Committee set responsible by the Ministry of Development
- The Consultative Committee will also be responsible for the economic management and accounting aspects for the proper implementation of the EPBD
- The quality control of energy audits will be carried out by the Centre of Renewable Energy Sources (CRES)*
- In case the quality of the energy audits or the soundness of certification is doubtful, the Institution could perform a countercheck and certification by another energy expert or by an executive expert from the Committee. Extra cost will overload the denouncement



Penalties

- Once the control is performed and it is noted that the certification includes information which is false, the Ministry of Development imposes penalties
- The Consultative Committee is responsible to inform the energy inspector in question 15 days in advance, in order for him/her to answer and for the Committee to find out if a penalty should be imposed

Penalties related to energy inspectors include:

- Inspector exclusion from energy audits for 1 up to 3 years
- Total inspector exclusion from record
- The Consultative Committee could also impose a pecuniary fine related to the severity of delinquency



Several regulations and initiatives provide incentives for improved energy efficiency in buildings:

- attractive kWh price for selling energy from renewables as defined in the Law for renewables
- several banks provide special loans for the integration of photovoltaics in buildings
- the Greek Government has recently developed the Project 'EXIKONOMO' which subsidies local government to upgrade the energy performance of existing public buildings and the improvement of the microclimate of open spaces
- a draft Law “Measures for the improvement of energy efficiency in final use and energy services” defines the legal frame and the financial means in order to achieve energy efficiency in the final use



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- Law 3468/2006: ‘Electricity production from renewable energy sources and cogeneration’, www.ypan.gr
- Common Ministerial Decision: ‘Special Development Project for photovoltaic installation in building sector and especially on the roofs”, www.ypan.gr



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