

# Τα οφέλη των μελών της ASHRAE: Τμήματα και Παραρτήματα ASHRAE

**Δημήτρης Α. Χαραλαμπόπουλος, B.Sc., M.Sc., BEAP**

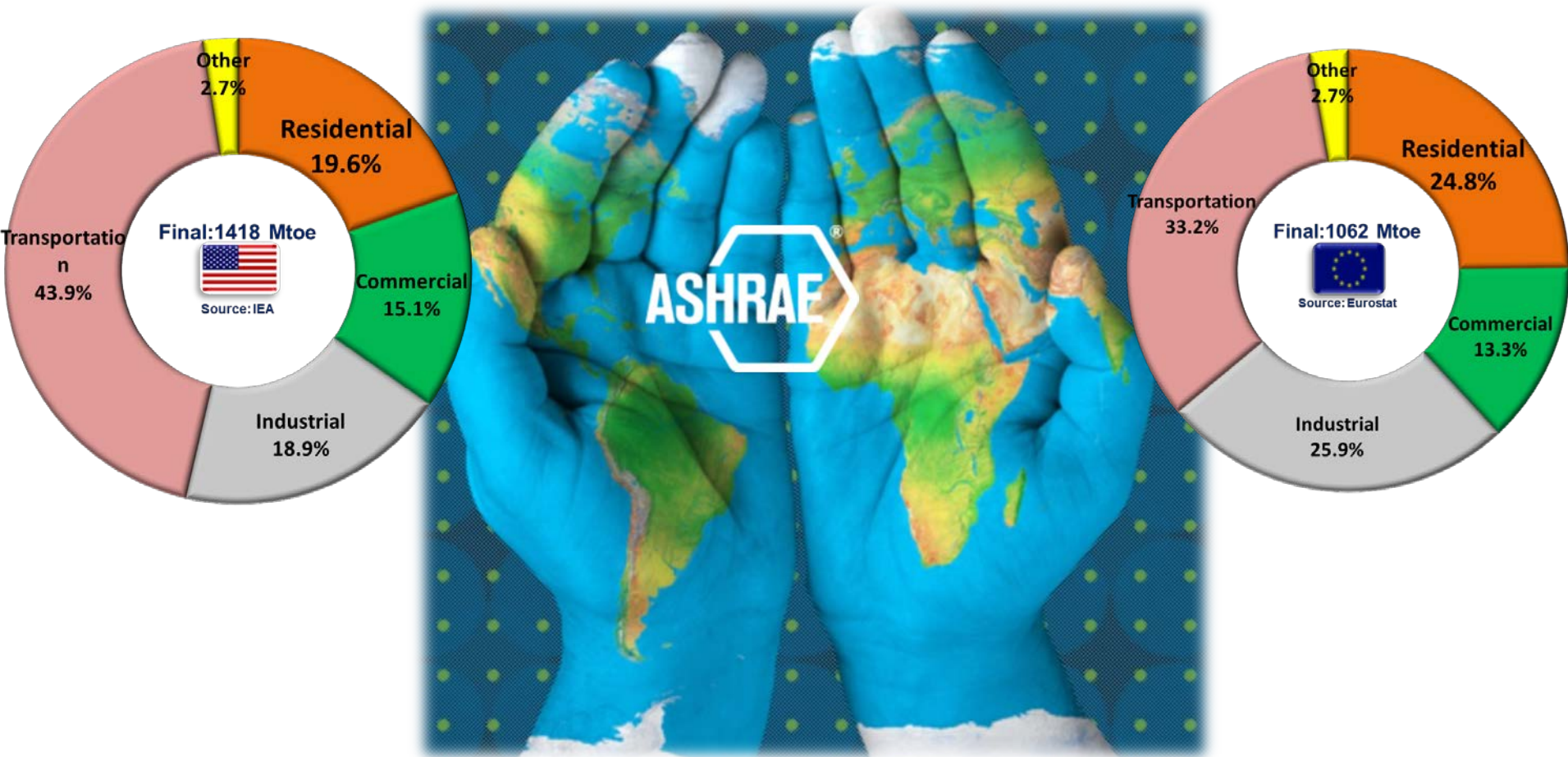
**Μηχανολόγος Μηχανικός**

**ASHRAE Hellenic Chapter Treasurer 2016-2017**

**ASHRAE Conferences & Expositions Committee**

**ASHRAE Planning Committee**

# ASHRAE & European Standards





# Towards Nearly ZEBs by 2020

## ➤ New Buildings

- **Residential:** *Most jurisdictions aim to annual primary energy <50 kWh/m<sup>2</sup>*
- **Non-Residential:** *Depends on type of building; primary energy 0 - 270 kWh/m<sup>2</sup>*  
*Some jurisdictions set a single target for offices, schools, hospitals*
- **End-Uses: Heating, DHW, Cooling, Ventilation, Lighting (for non-residential)**  
*Very few jurisdictions consider plug loads (e.g. Austria, Estonia) or vertical transportation systems (lifts and escalators for non-residential buildings in Italy)*
- **Basis for Comparison (Min requirements):** *Practically all jurisdictions consider Primary Energy; Several consider thermal transmittance coefficient (U-value); Some include CO<sub>2</sub> emissions; Few set Prescriptive requirements for technical systems*
- **RES min requirements** are imposed by many jurisdictions

## ➤ Existing Buildings

- **Criteria for NZEB renovation identified in 13 jurisdictions**
- **Definitions in 8 (so far)**  
*Half have the same requirements for new & existing buildings; Others set less strict limits*



# Indoor Environmental Quality



➤ **55-2013 Thermal Environmental Conditions for Human Occupancy**

Specify the combinations of indoor thermal environmental factors and personal factors that will produce thermal environmental conditions acceptable to a majority of the occupants within the space



➤ **62.1-2016 Ventilation for Acceptable Indoor Air Quality**

Minimum ventilation rates and other measures intended to provide indoor air quality (IAQ) that is acceptable to human occupants and that minimizes adverse health effects

**Performance based approaches:** IAQ Procedure; Ventilation Rate Procedure; Natural Ventilation Procedure



➤ **62.2 -2016 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings**

Defines the roles of and minimum requirements for mechanical and natural ventilation systems and the building envelope intended to provide acceptable IAQ in residential buildings



➤ **170-2013 Ventilation of Health Care Facilities**

Defines ventilation system design requirements that provide environmental control for comfort, asepsis, and odor in health care facilities

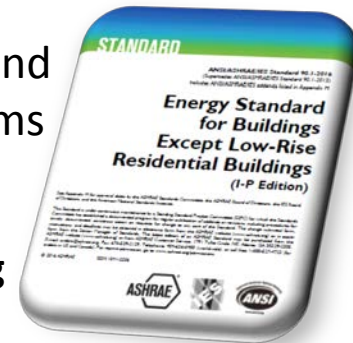


# Standard 90.1-2016

## Energy Std for Buildings Except Low-Rise Residential Buildings

Provides **minimum energy efficiency requirements for design and construction** and a plan for **operation & maintenance**, for new buildings and their systems, new portions of buildings and their systems, and new systems and equipment in existing buildings; and **utilization of on-site renewables**

- Building envelope
  - Service water heating
  - Lighting
  - Energy cost budget method
  - Heating , Ventilating & Air-conditioning
  - Power
  - Other equipment
- ✓ Appendix G – Performance Rating Method
  - ✓ Numerous energy saving measures



**Cost-Effective**



# Standard 90.2-2007

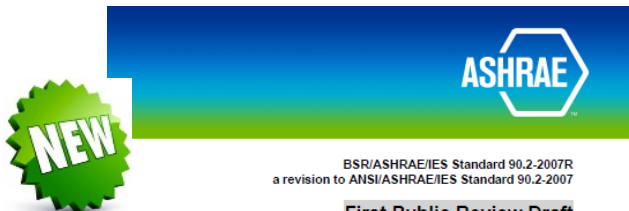
## Energy-Efficient Design of Low-Rise Residential Buildings

Provides **minimum energy-efficiency requirements** for design and **construction** of new residential dwelling units and their systems and where explicitly specified, new portions of residential dwelling units and their systems and new systems and equipment in existing dwelling units

- **Building envelope**
- **Heating equipment, systems**
- **Air-conditioning equipment, systems**
- **DHW heating equipment, systems**
- **Provisions for overall building design alternatives and trade-offs**



**Cost-Effective**



BSR/ASHRAE/IES Standard 90.2-2007R  
a revision to ANSI/ASHRAE/IES Standard 90.2-2007

**First Public Review Draft**  
**Proposed Standard 90.2-2007R,**  
**Energy-Efficient Design of Low-**  
**Rise Residential Buildings**

First Public Review (November 2016)  
(Complete Draft for Full Review)

This draft has been recommended for public review by the responsible project committee. To submit a comment on this proposed standard, go to the ASHRAE website at [www.ashrae.org/standards-committee](http://www.ashrae.org/standards-committee) and access the online comment database. The draft is subject to modification until it is approved for publication by the Board of Directors and ANSI. Until this time, the current edition of the standard (as modified by any published addenda on the ASHRAE website) remains in effect. The current edition of any standard may be purchased from the ASHRAE Online Store at [www.ashrae.org/bookstore](http://www.ashrae.org/bookstore), or by calling 404-636-6400 or 1-800-727-4723 (for orders in the U.S. or Canada).

The appearance of any technical data or editorial material in this public review document does not constitute endorsement, warranty, or guaranty by ASHRAE of any product, service, process, procedure, or design, and ASHRAE expressly disclaims such.

© 2016 ASHRAE. This draft is covered under ASHRAE copyright. Permission to reproduce or redistribute all or any part of this document must be obtained from the ASHRAE Manager of Standards, 1791 Tullie Circle, NE, Atlanta, GA 30329. Phone: 404-636-6400, Ext. 1125. Fax: 404-321-5478. E-mail: [standards\\_section@ashrae.org](mailto:standards_section@ashrae.org)

ASHRAE, 1791 Tullie Circle, NE, Atlanta GA 30328-2096

- *Participate in the public review process currently open till December 19, 2016*

<https://osr.ashrae.org/default.aspx>

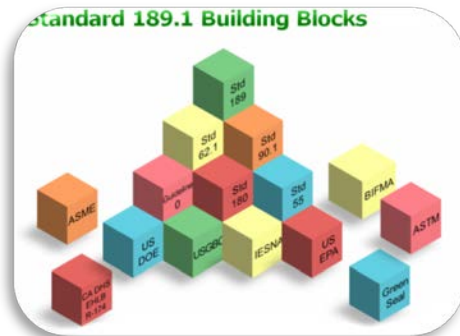
# Standard 189.1-2014

➤ **High-performance green buildings**, balancing energy efficiency, environmental responsibility, resource efficiency, occupant comfort, community sensitivity

- ✓ From site selection & sustainability to recycling
- ✓ Serves as benchmark for sustainable green buildings
- ✓ Jurisdictional compliance option – **IgCC**

Int. Green Construction Code

ASHRAE Std 189.1 & IgCC will merge in 2018 with Standard 189.1 being the technical basis



**Prescriptive:** each component is built to a certain standard, e.g. Uwall, boiler eff.



## Make 'sustainable' design 'doable'

**Performance:** the whole building performs to a certain standard, e.g. use less energy than the same building built to prescriptive code





# Comparing Energy Performance



## ➤ Standard 105-2014

Expressing, and Comparing Building Energy Performance and Greenhouse Gas Emissions



## ➤ Building Energy Quotient (bEQ)

- **In Operation Rating**

based on the **measured energy use**; assess specific energy savings measures with estimated costs and payback information to improve building energy performance  
Applicable for existing buildings and after 12-18 mos of operation for new buildings

- **As Designed Rating**

based on **simulation** results; standardized inputs as compared to a baseline median EUI to evaluate a building's potential energy use independent of operational and occupancy variables  
Applicable to new & existing buildings

# Advanced Energy Design Guides

*Design strategies (“how to implement” tips); Prescriptive & performance solutions; Practical, off-the-shelf technology; Recommendations for additional energy savings; Case studies*



## ➤ **30% Guides** *Achieve 30% energy savings relative to 90.1-1999*

- ✓ Small Office
- ✓ Small Retail
- ✓ K-12 Schools
- ✓ Warehouses
- ✓ Highway Lodging
- ✓ Healthcare facilities



<https://www.ashrae.org/standards-research--technology/advanced-energy-design-guides>



## ➤ **50% Guides** *Achieve 50% energy savings relative to 90.1-2004*

- ✓ Small-medium Office
- ✓ K-12 School buildings
- ✓ Medium to big box Retail
- ✓ Large Hospitals
- ✓ Grocery stores



## ➤ **GreenGuide**

### "What do I do?" to design a green building

*For HVAC&R system designer, architect, building owner, building manager/operator, or contractor*  
*From **planning to operation and maintenance** of a facility, with emphasis on **teamwork** & close coordination among interested parties; **GreenTips** highlight techniques, processes, measures*



# Existing Buildings

## ➤ Energy Efficiency Guide for Existing Commercial Buildings



The Business Case for Building  
Owners & Managers



Technical  
Implementation



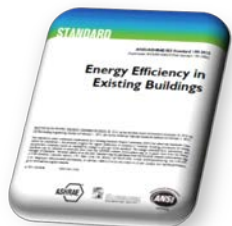
### ➤ Guideline 32-2012

Sustainable, High-Performance Operations & Maintenance



### ➤ Standard 180-2012

Standard Practice for Inspection & Maintenance of Commercial Building HVAC  
Systems

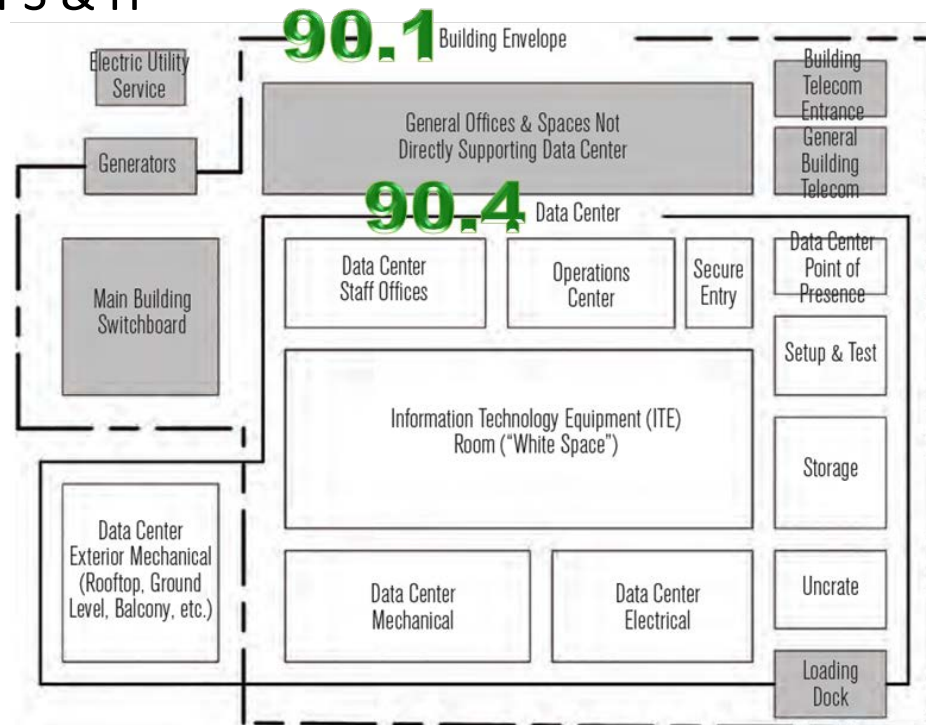
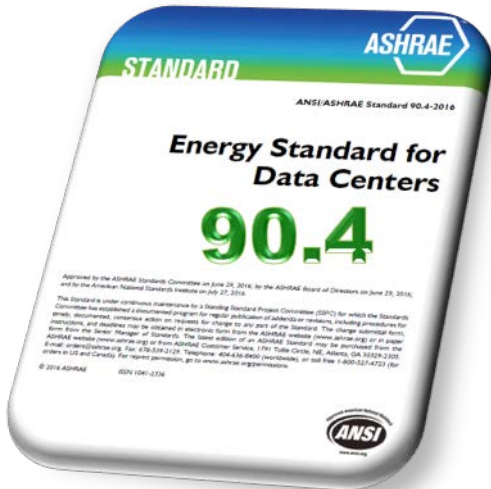


### ➤ Standard 100-2015

Energy Efficiency in Existing Buildings

# Standard 90.4-2016 Data Centers

- **Code-intended performance-based energy standard**
  - Work in concert with Standard 90.1
- **Minimum design requirements**
  - Mechanical Load Component (MLC); power and energy compliance path
  - Electrical Loss Component (ELC); losses and efficiencies of incoming electrical service, UPS & IT





# ΠΙΣΤΟΠΟΙΗΣΗ ASHRAE

- ✓ **BOUGATSOU A. (HFDP)**
  - ✓ **CHARALAMBOPOULOS D. (BEAP)**
  - ✓ **DALAVOURAS Ch. (BEAP)**
  - ✓ **DALAVOURAS D. (CPMP, OPMP)**
  - ✓ **DALAVOURAS P. (BEMP)**
  - ✓ **KATEMIS N-F. (CPMP)**
  - ✓ **LASKOS K. (BEMP)**
  - ✓ **MANTAS D. (BEAP)**
  - ✓ **MERIS N. (BEAP, OPMP)**
  - ✓ **MOISIDIS Ch. (CPMP)**
  - ✓ **PARASKEVOPOULOS V. (CPMP)**
  - ✓ **PAVLOU K. (BEMP)**
  - ✓ **SERPETZOGLOU V. (BEAP)**
  - ✓ **TONGOS S. (CPMP)**
- **Building Energy Assessment Professional (BEAP)**
  - **Building Energy Modeling Professional (BEMP)**
  - **Commissioning Process Management Professional (CPMP)**
  - **Health Facility Design Professional (HFDP)**
  - **High-Performance Building Design Professional (HBDP)**
  - **Operations & Performance Management Professional (OPMP)**



Εξετάσεις στην  
ΑΘΗΝΑ





# ΠΙΣΤΟΠΟΙΗΣΗ ASHRAE BEAP για ΕΝΕΡΓΕΙΑΚΟΥΣ ΕΛΕΓΚΤΕΣ

**ΒΑΣΕΙ ΤΗΣ ΚΥΑ: οικ. 188343/2016 - ΦΕΚ 4508/Β/30-12-2016:**

<https://www.e-nomothesia.gr/epaggelmata-tekhnes/koine-upourgike-apophase-oik-188343-2016.html>

**Η ΠΙΣΤΟΠΟΙΗΣΗ Β.Ε.Α.Ρ. ΑΝΤΑΜΟΙΒΕΤΑΙ ΜΕ 2 ΒΑΘΜΟΥΣ ΣΤΗ ΔΙΑΔΙΚΑΣΙΑ ΑΠΟΚΤΗΣΗΣ ΕΜΠΕΙΡΙΑΣ ΓΙΑ ΤΟΥΣ ΕΝΕΡΓΕΙΑΚΟΥΣ ΕΛΕΓΚΤΕΣ**



Τεύχος Β' 4508/30.12.2016

ΕΦΗΜΕΡΙΔΑ ΤΗΣ ΚΥΒΕΡΝΗΣΕΩΣ

45711



45709

## ΕΦΗΜΕΡΙΔΑ ΤΗΣ ΚΥΒΕΡΝΗΣΕΩΣ ΤΗΣ ΕΛΛΗΝΙΚΗΣ ΔΗΜΟΚΡΑΤΙΑΣ

30 Δεκεμβρίου 2016

ΤΕΥΧΟΣ ΔΕΥΤΕΡΟ

Αρ. Φύλλου 4508

### ΠΕΡΙΕΧΟΜΕΝΑ

#### ΑΠΟΦΑΣΕΙΣ

1. Συστήματα αναγνώρισης προσόντων και πιστοποίησης Ενεργειακών Ελεγκτών, Μητρώο Ενεργειακών Ελεγκτών και Αρχείο Ενεργειακών Ελέγχων.
2. Ορισμός Φορέα Κατάρτισης Συμβούλων Ασφαλούς Μεταφοράς Επικίνδυνων Εμπορευμάτων.

5. Το π.δ. 125/2016 "Διορισμός Υπουργών, Αναπληρωτών Υπουργών και Υφυπουργών" (ΦΕΚ Α' 210).

6. Την Υ198/16.11.2016 απόφαση του Πρωθυπουργού "Ανάθεση αρμοδιοτήτων στον Αναπληρωτή Υπουργό Περιβάλλοντος και Ενέργειας Σωκράτη Φαμέλλο" (ΦΕΚ Β' 3722).

7. Το υπ' αριθ. ΔΕΠΕΑ/Γ/οικ.183246/19.09.2016 έγγραφο του Τμήματος Ενεργειακής Αποδοτικότητας της Διεύθυνσης Ενεργειακών Πολιτικών και Ενεργειακής Αποδοτικότητας του Υπουργείου Περιβάλλοντος και Ενέργειας.

8. Το γεγονός ότι από τις διατάξεις της παρούσας απόφασης δεν παραλείπεται διατύπωση σε βάρος του Κοσμήτο

<p>Επιτυχής ολοκλήρωση των κατωτέρω ευρωπαϊκών ή διεθνών προγραμμάτων πιστοποίησης/εκπαίδευσης: Association of Energy Engineers - certified energy auditor international (CEA-I) Association of Energy Engineers - certified energy manager international (CEM-I) Greek-German Chamber of Commerce and Industry -European Energy Manager (EuREM) <b>ASHRAE - Building Energy Assessment Professional certification (BEAP)</b> IRCA Certified Course - Energy Management Systems Auditor/Lead Auditor Training Course Energy Institute -Advanced Energy Manager (AEM) Energy Institute - Chartered Energy Manager, καθώς και άλλα προγράμματα πιστοποίησης/εκπαίδευσης ενεργειακών ελεγκτών/διαχειριστών που διεξάγονται από το Τεχνικό Επιμελητήριο Ελλάδος, τα ΑΕΙ, ΑΤΕΙ</p>	<p>2</p>	<p>Μεταλλείων του Υπουργείου Περιβάλλοντος και Ενέργειας. 6. Τα πιστοποιητικά προϋπηρεσίας ή βεβαιώσεις έργου της παρ. 2 του άρθρου 4 του παρόντος ελέγχονται από τα Τμήματα Επιθεώρησης Ενέργειας Νοτίου και Βορείου Ελλάδος του Σώματος Επιθεώρησης Περιβάλλοντος, Δόμησης, Ενέργειας και Μεταλλείων του Υπουργείου Περιβάλλοντος και Ενέργειας. 7. Για τους ασκούντες τους ενεργειακούς ελέγχους σε χώρες της Ευρωπαϊκής Ένωσης και προκειμένου να ασκήσουν την εν λόγω επαγγελματική δραστηριότητα στη χώρα μας, αρμόδιο όργανο για την πιστοποίηση της άσκησης της συγκεκριμένης επαγγελματικής δραστηριότητας είναι το Συμβούλιο Αναγνώρισης Επαγγελματικών Προσόντων (ΣΑΕΠ), σύμφωνα με τις διατάξεις του άρθρου 54 του π.δ.38/2010.</p> <p>Άρθρο 5 Διαδικασία εγγραφής στο Μητρώο Ενεργειακών Ελεγκτών</p> <p>1. Για την άσκηση της δραστηριότητας του Ενεργειακού Ελεγκτή ακολουθείται η διαδικασία του άρθρου 3 του ν.3919/2011 (ΦΕΚ Α' 32), ήτοι: α) Υποβολή Αναγγελίας έναρξης άσκησης της δραστηριότητας του Ενεργειακού Ελεγκτή, σύμφωνα με τις διατάξεις του άρθρου 3 του ν.3919/2011, προς τα Τμήματα Επιθεώρησης Ενέργειας Νοτίου και Βορείου Ελλάδος του Σώματος Επιθεώρησης Περιβάλλοντος, Δόμησης, Ενέργειας</p>
---	----------	--