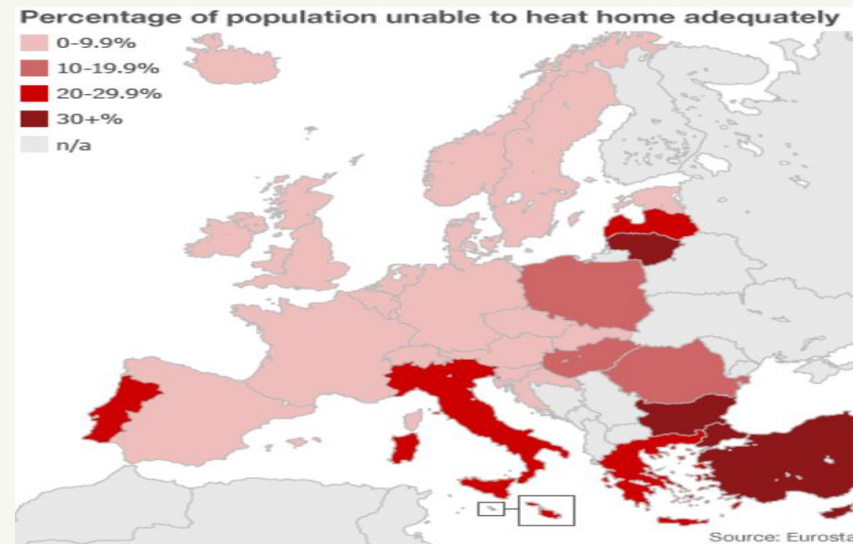


# ENERGY CONSUMPTION PROFILE OF THE EXISTING BUILDING STOCK IN GREECE



**MARGARITA PETROLIAGKI**  
HEAD OF ENERGY INSPECTION DEPARTMENT  
DIRECTORATE OF HELLENIC SOUTHERN INSPECTORATE  
MARCH 2018

# ENERGY STRATEGY AND ENERGY UNION



**The European Union's energy policies are driven by three main objectives:**

***We want...***

**1**

**Secure energy suppliers to ensure the reliable provision of energy whenever and wherever it is needed.**

**2**

**Energy providers operate in a competitive environment that ensures affordable prices for homes, businesses, and industries.**

**3**

**Energy consumption to be sustainable, through the lowering of greenhouse gas emissions, pollution, and fossil fuel dependence.**

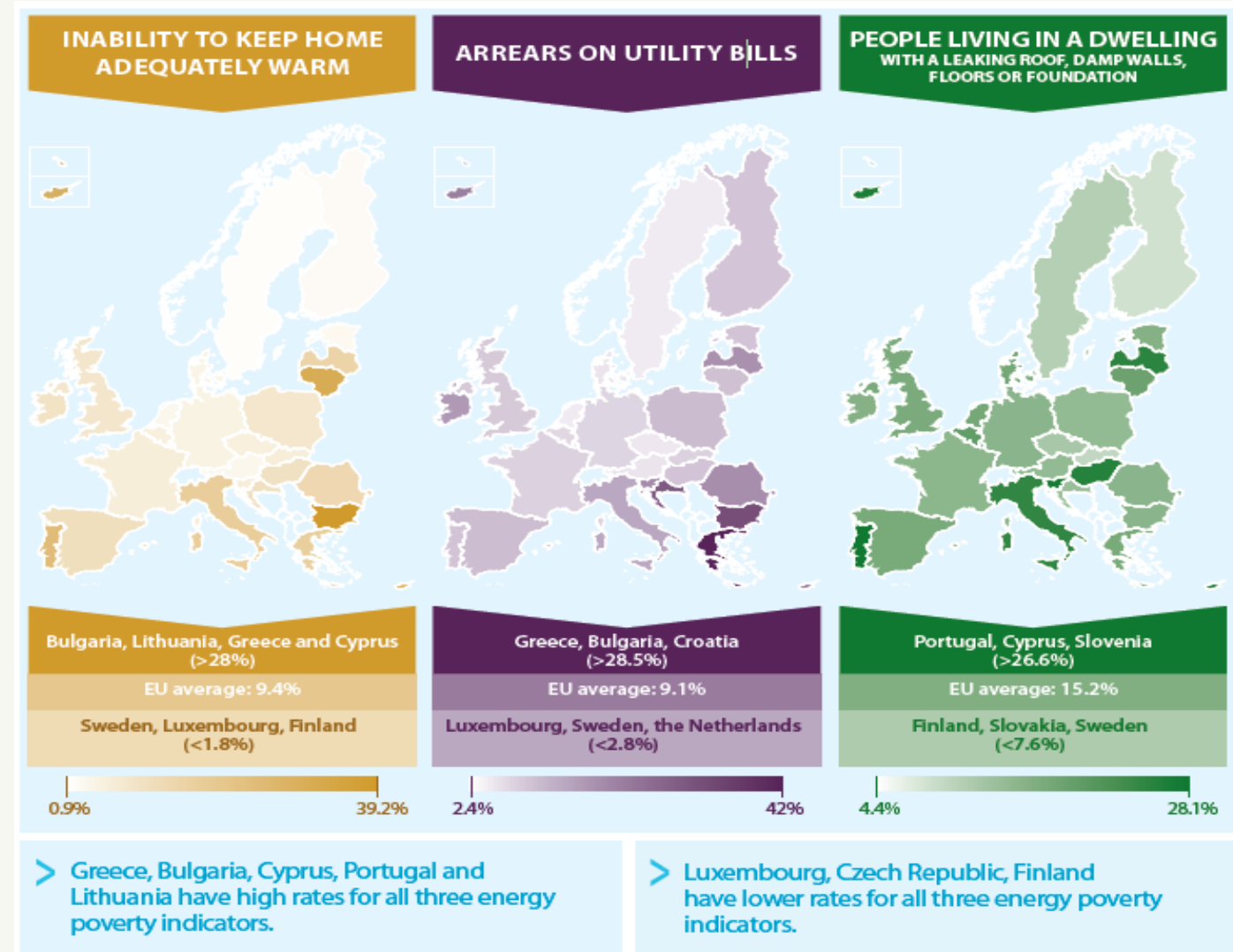
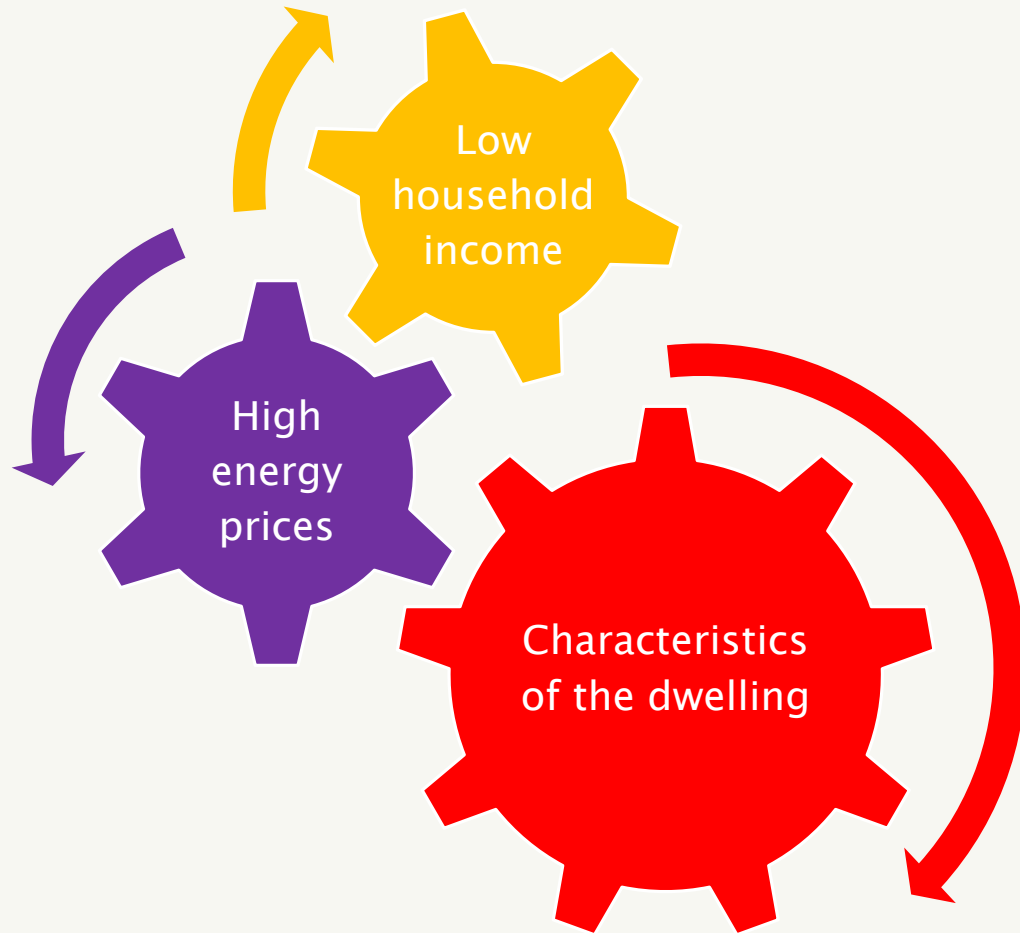
# ENERGY STRATEGY AND ENERGY UNION



## New targets to be met by 2030:

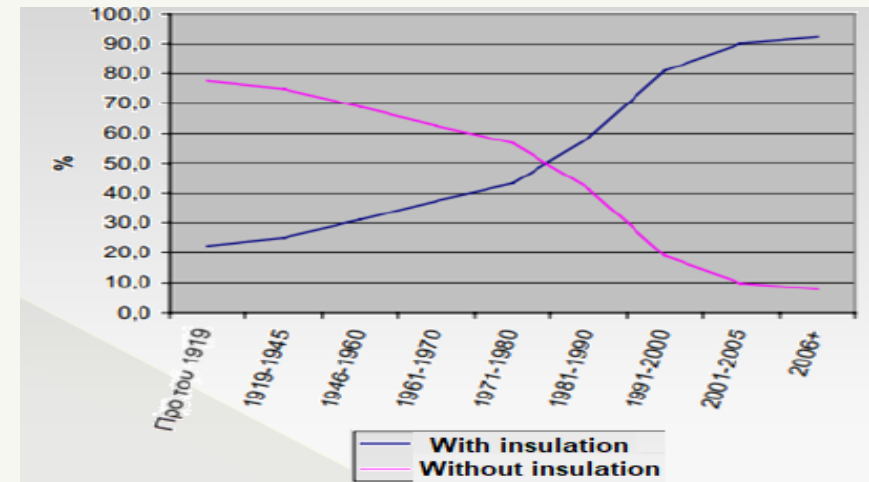
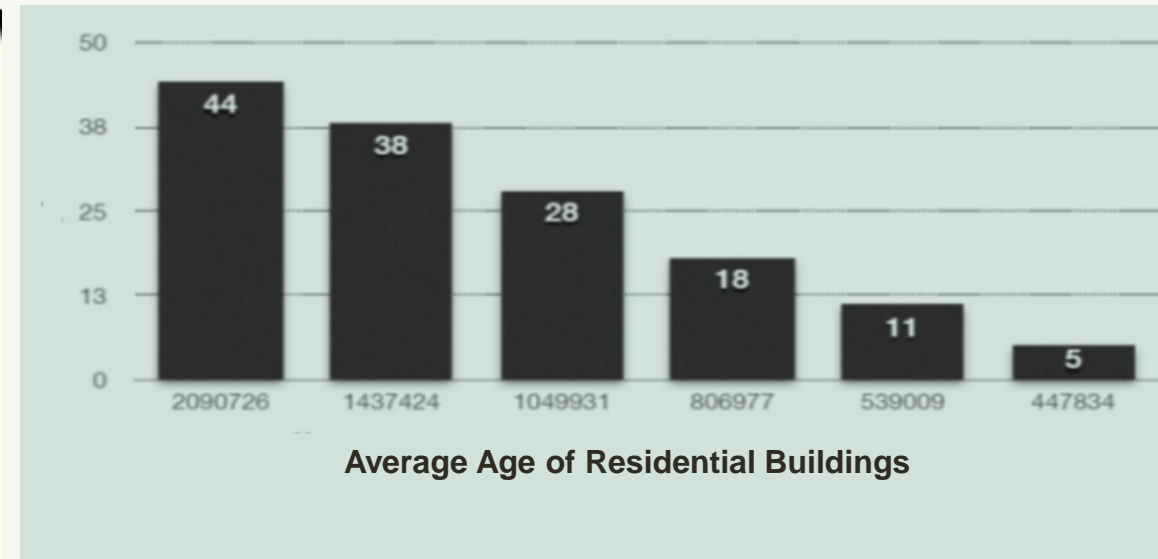
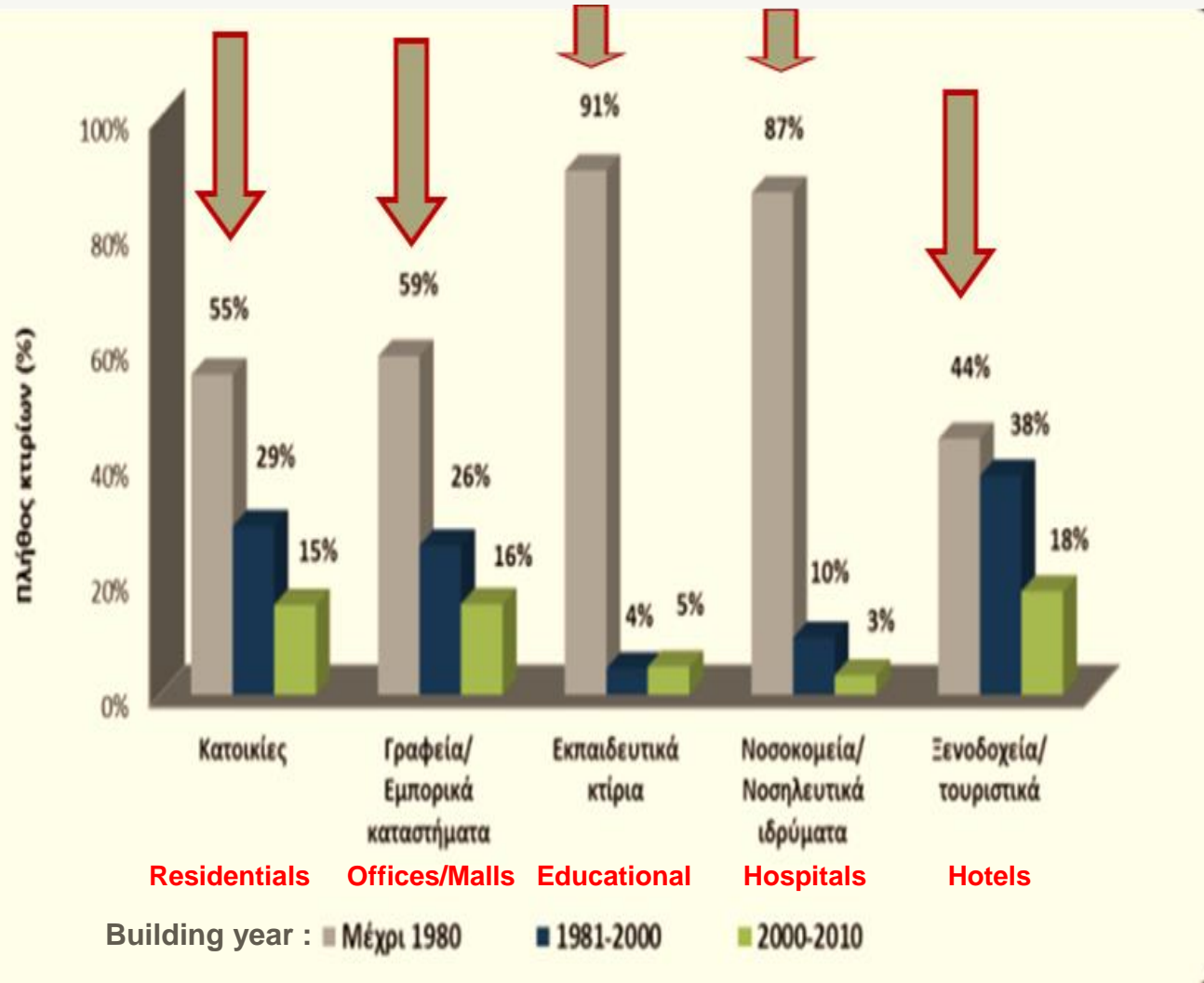
- ❖ At least a **40% reduction** in **greenhouse gas emissions** by 2030, compared to 1990.
- ❖ At least **27% of renewable energy** in the EU.
- ❖ An **energy efficiency increase of at least 27%**, to be reviewed by 2020 with the potential to **raise the target to 30%** by 2030.
- ❖ The completion of the internal energy market by reaching an electricity interconnection target of **15% between EU countries by 2030**, and pushing forward important infrastructure projects.

# ENERGY POVERTY IN EUROPE



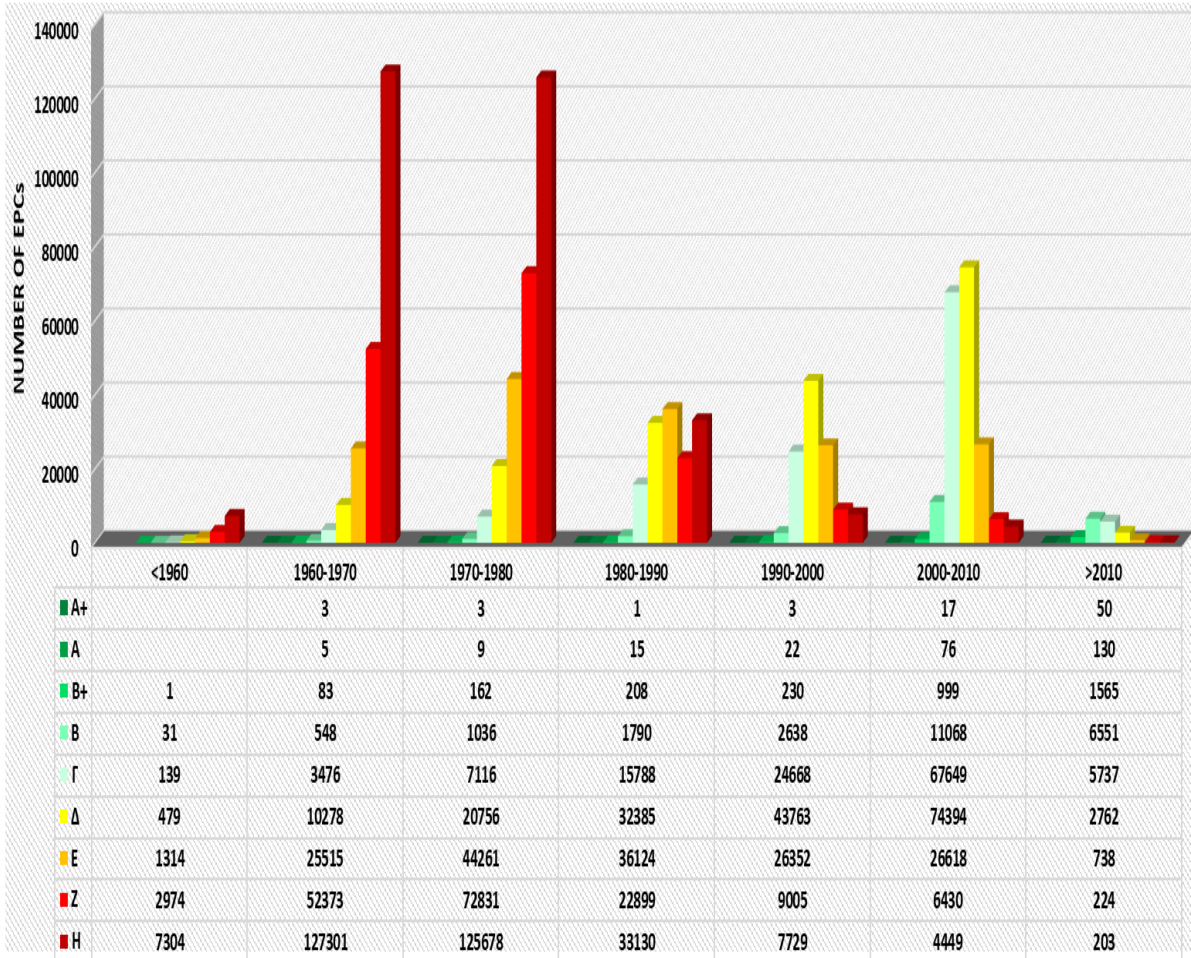
Source: BPIE own analysis based on 2015 Eurostat data

# BUILDING STOCK IN GREECE

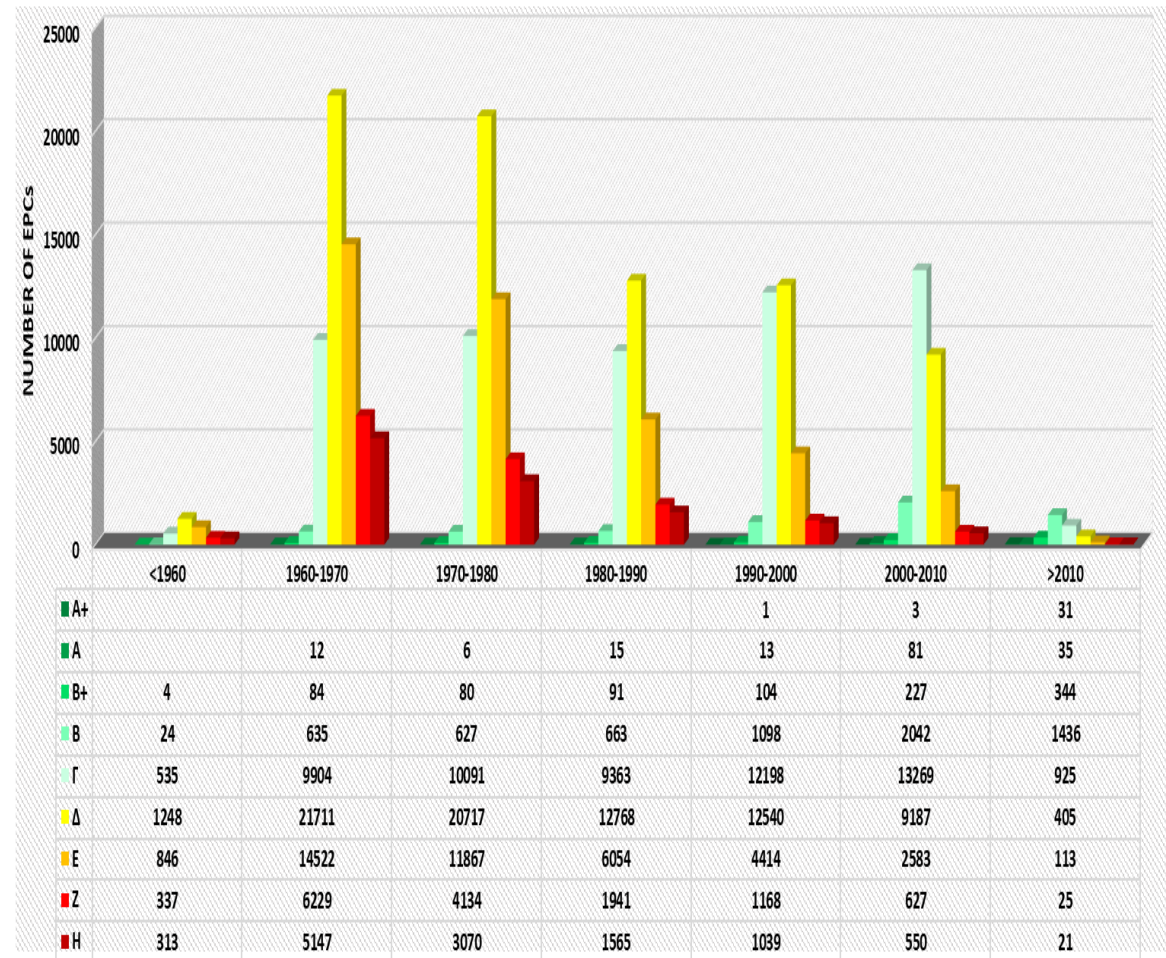




### ENERGY PERFORMANCE OF RESIDENTIALS PER CONSTRUCTION YEAR

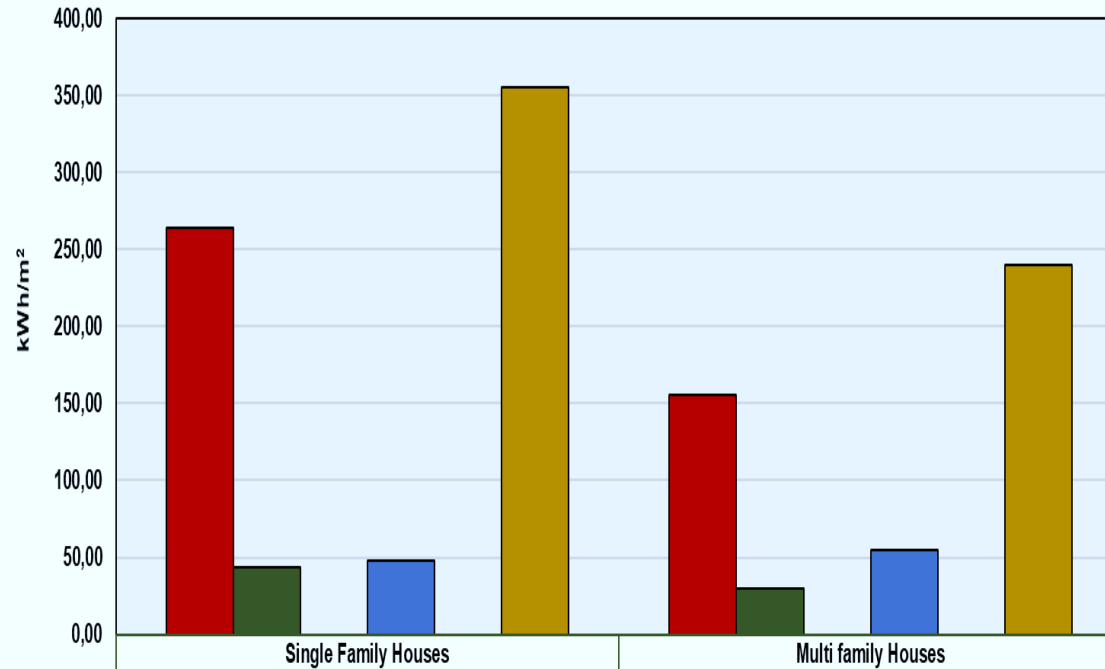


### ENERGY PERFORMANCE OF BUILDINGS OF THE TERTIARY SECTOR PER CONSTRUCTION YEAR



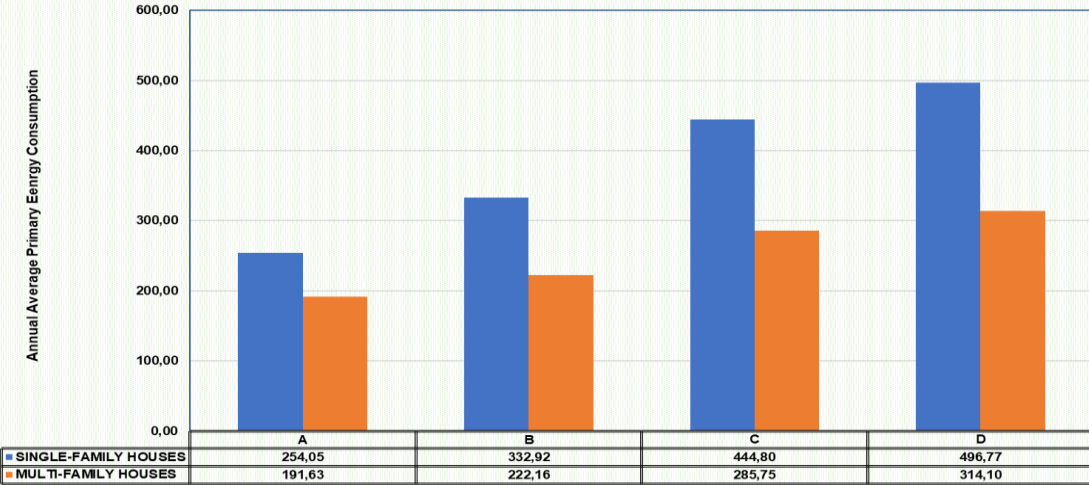
# ANNUAL AVERAGE PRIMARY ENERGY CONSUMPTION OF RESIDENTIAL BUILDINGS

### AVERAGE PRIMARY ENERGY CONSUMPTION OF RESIDENTIAL BUILDINGS

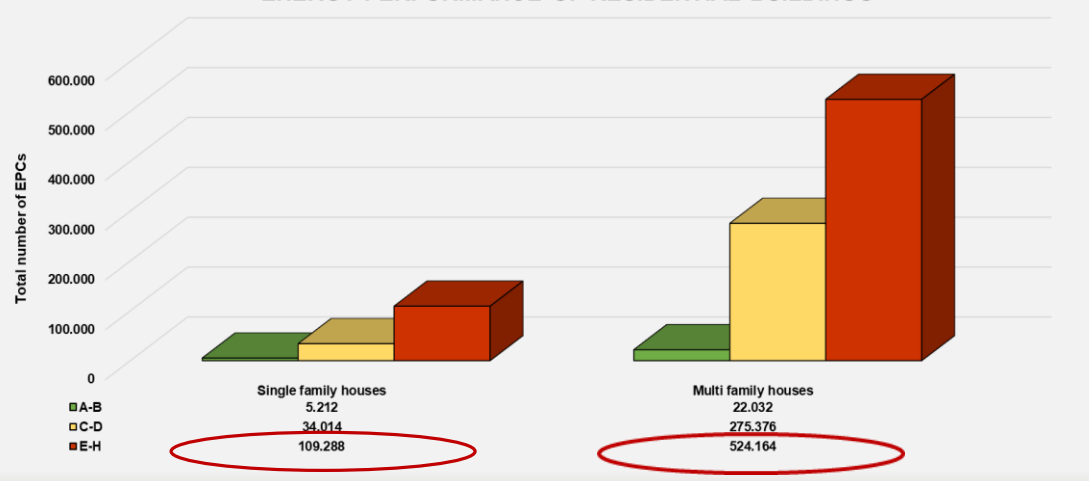


Category	Single Family Houses	Multi family Houses
'Prim. Energy Cons. Heating'	264,11	155,66
'Prim. Energy Cons. Cooling'	43,48	29,59
'Prim. Energy Cons. Lighting'	0,00	0,00
'Prim. Energy Cons. Domestic Hot Water'	47,68	54,87
'Prim. Energy Cons. RES'	0,17	0,02
'Total Prim. Energy Consumption'	355,18	240,11

### ENERGY CONSUMPTION OF RESIDENTIAL BUILDINGS PER CLIMATE ZONES



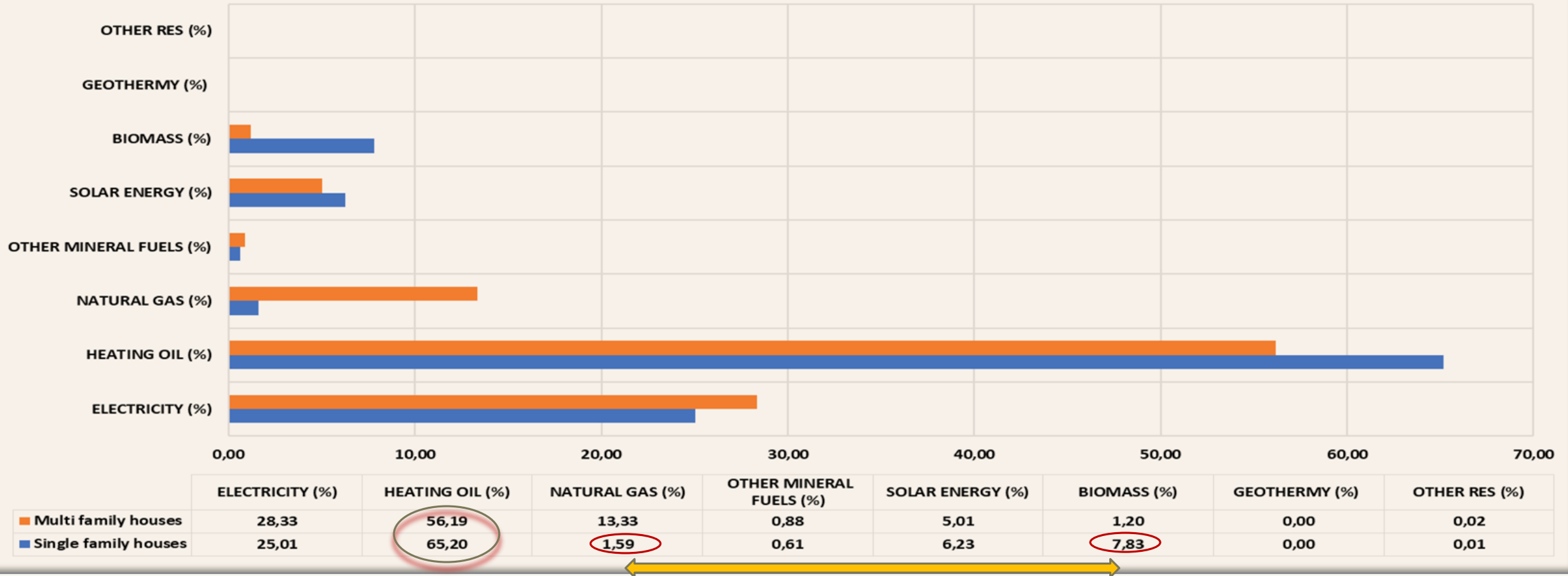
### ENERGY PERFORMANCE OF RESIDENTIAL BUILDINGS





# ENERGY BALANCE OF RESIDENTIAL BUILDINGS

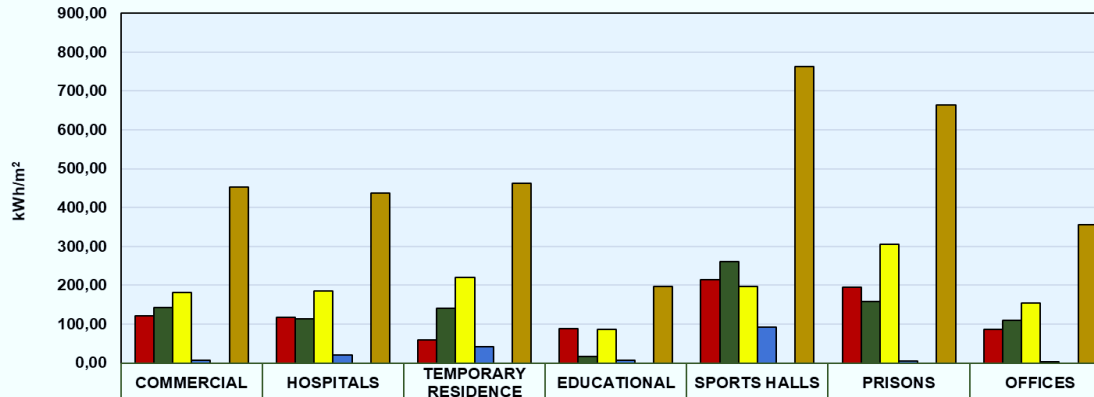
## CONTRIBUTION TO THE ENERGY BALANCE OF RESIDENTIAL BUILDINGS





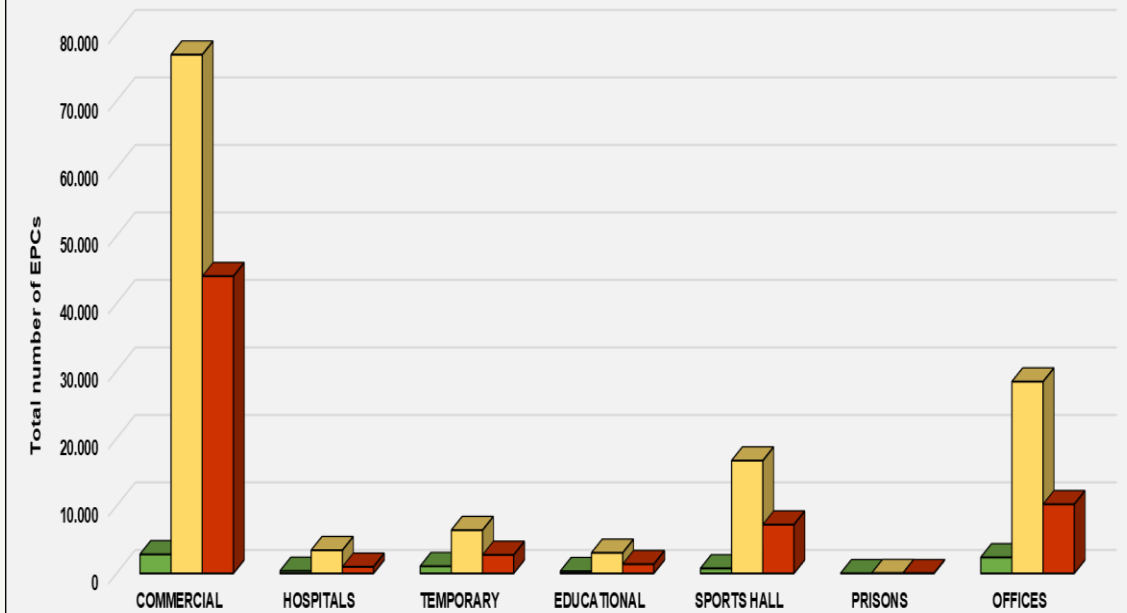
# ANNUAL AVERAGE PRIMARY ENERGY CONSUMPTION OF NON-RESIDENTIAL BUILDINGS

AVERAGE PRIMARY ENERGY CONSUMPTION OF NON-RESIDENTIAL BUILDINGS

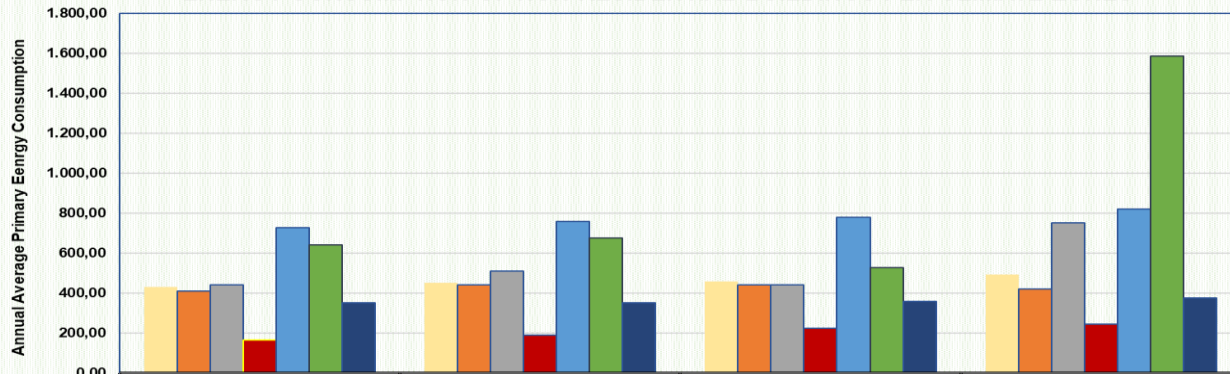


Category	COMMERCIAL	HOSPITALS	TEMPORARY RESIDENCE	EDUCATIONAL	SPORTS HALLS	PRISONS	OFFICES
'Prim. Energy Cons. Heating'	122,17	117,95	59,72	87,48	213,87	195,44	86,89
'Prim. Energy Cons. Cooling'	142,30	112,67	140,11	16,78	260,72	157,70	110,35
'Prim. Energy Cons. Lighting'	180,74	186,07	220,15	85,88	196,10	304,61	154,83
'Prim. Energy Cons. Domestic Hot Water'	6,84	20,23	42,48	7,89	91,68	5,73	3,07
'Prim. Energy Cons. RES'	0,05	0,09	0,14	0,12	0,05	0,00	0,19
'Total Prim. Energy Consumption'	451,99	436,84	462,32	197,91	762,32	663,48	354,97

ENERGY PERFORMANCE OF NON-RESIDENTIAL BUILDINGS



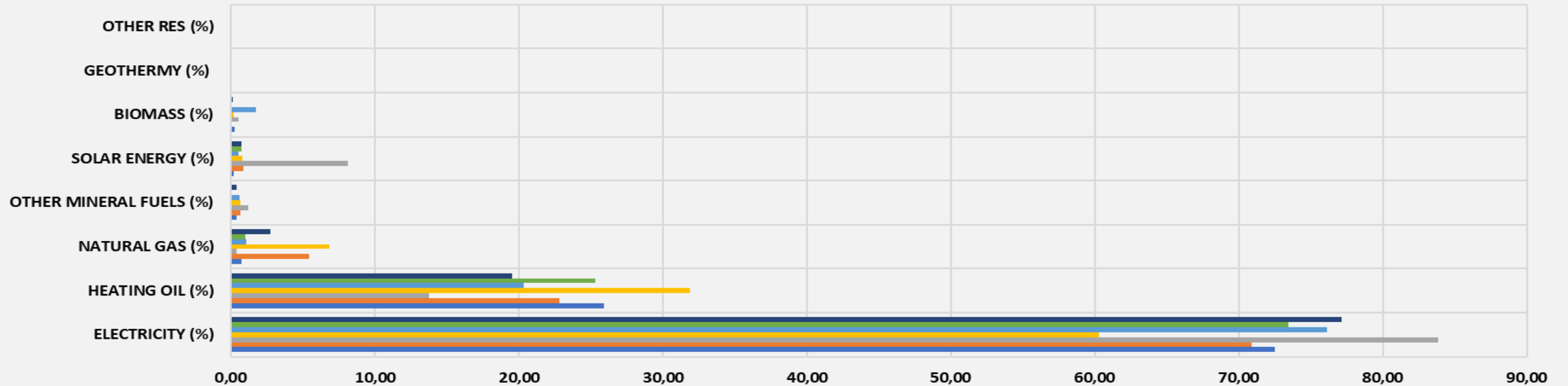
ENERGY CONSUMPTION OF NON-RESIDENTIAL BUILDINGS PER CLIMATE ZONES



Building Type	A	B	C	D
Ευρωπαϊού	433,08	451,86	459,11	493,15
Hospitals	410,75	441,31	441,45	420,92
Temporary Residence	440,13	510,14	442,57	752,37
Educational	167,41	190,46	223,63	243,65
Sports Halls	729,37	760,92	780,69	822,84
Prisons	640,56	675,86	528,31	1.586,60
Offices	353,51	353,45	358,08	375,33

# ANNUAL AVERAGE ENERGY CONSUMPTION OF NON-RESIDENTIAL BUILDINGS

## CONTRIBUTION TO THE ENERGY BALANCE OF NON-RESIDENTIAL BUILDINGS

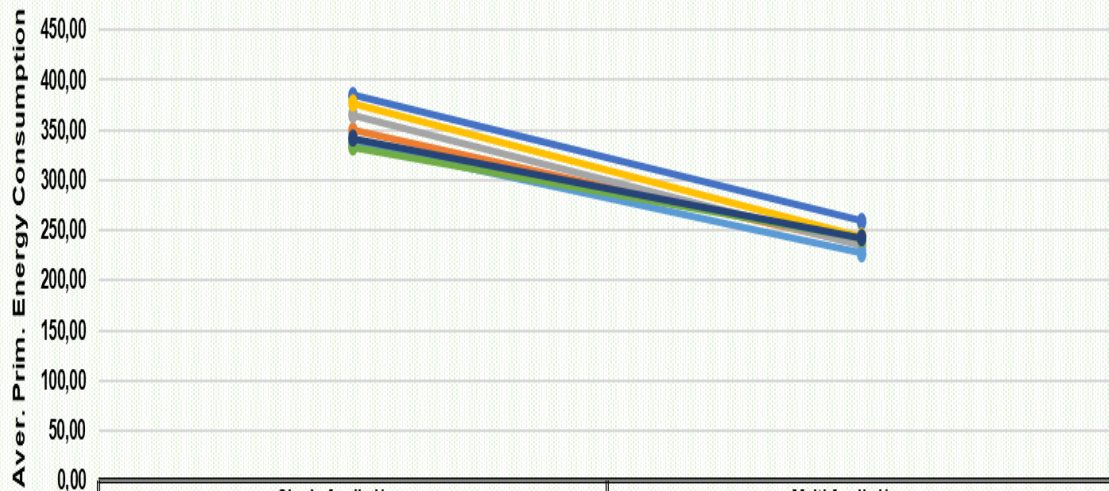


	ELECTRICITY (%)	HEATING OIL (%)	NATURAL GAS (%)	OTHER MINERAL FUELS (%)	SOLAR ENERGY (%)	BIOMASS (%)	GEOTHERMY (%)	OTHER RES (%)
■ OFFICES	77,10	19,51	2,72	0,40	0,76	0,12	0,00	0,01
■ PRISONS	73,41	25,27	1,03	0,00	0,71	0,00	0,00	0,00
■ SPORTS HALLS	76,09	20,36	1,06	0,63	0,52	1,72	0,00	0,01
■ EDUCATIONAL	60,26	31,88	6,81	0,69	0,77	0,22	0,00	0,00
■ TEMPORALY RESIDENCE	83,83	13,74	0,38	1,19	8,09	0,55	0,00	0,00
■ HOSPITALS	70,86	22,82	5,46	0,65	0,86	0,08	0,00	0,00
■ COMMERCIAL	72,53	25,89	0,74	0,42	0,22	0,28	0,00	0,01



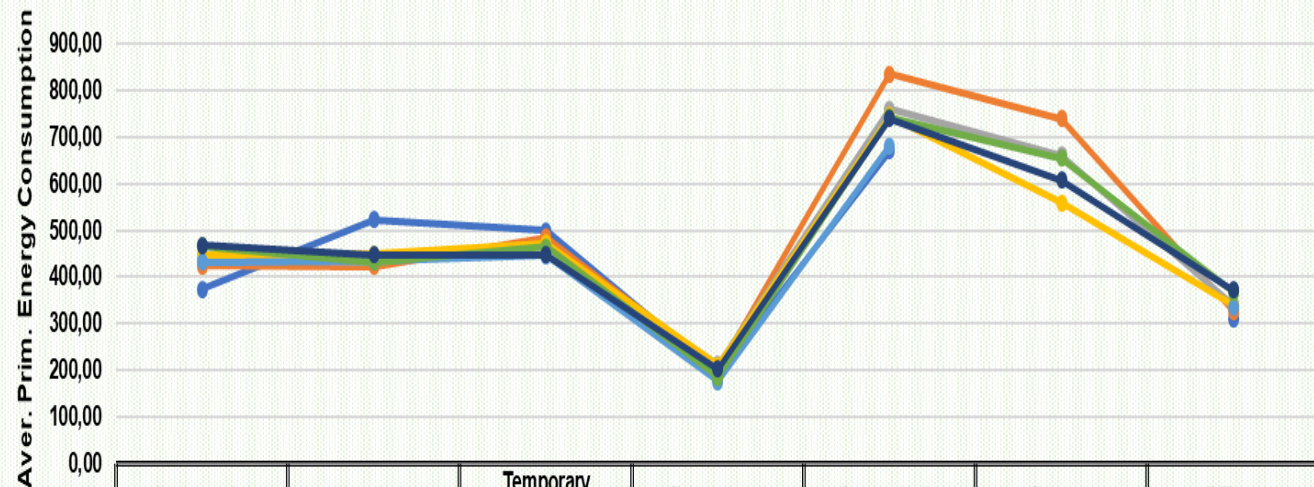
# ANNUAL AVERAGE ENERGY CONSUMPTION OF BUILDINGS FOR THE PERIOD 2011-2017

### ENERGY CONSUMPTION OF RESIDENTIAL BUILDINGS FOR THE PERIOD 2011 - 2017



	Single-family Houses	Multi-family Houses
2011	385,03	259,51
2012	349,82	236,97
2013	365,58	234,76
2014	376,73	243,93
2015	337,35	227,40
2016	332,84	241,86
2017	341,72	242,36

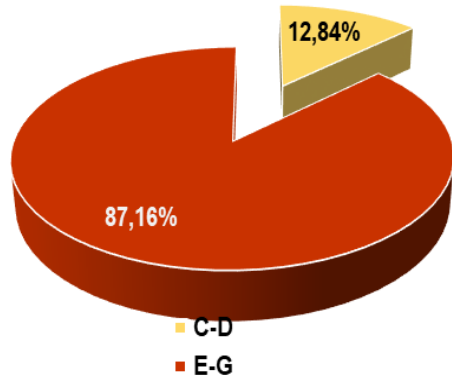
### ENERGY CONSUMPTION OF NON-RESIDENTIAL BUILDINGS FOR THE PERIOD 2011 - 2017



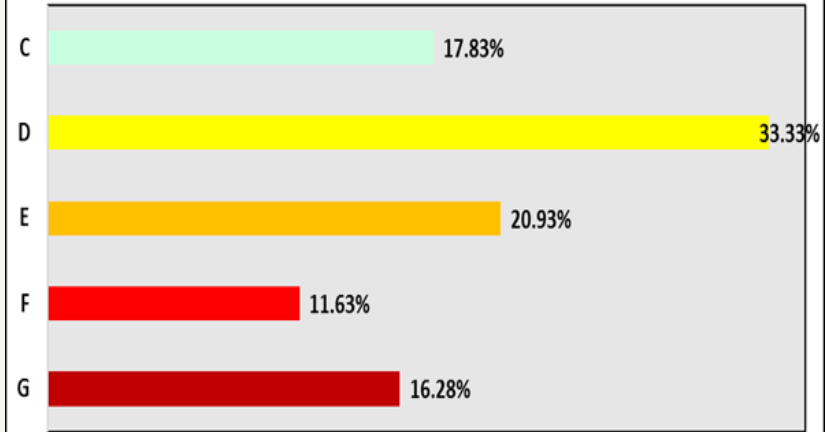
	Commercial	Hospitals	Temporary Residence	Educational	Sports Halls	Prisons	Offices
2011	373,59	523,68	498,96	193,83	670,21		310,66
2012	423,96	422,16	486,24	201,96	836,34	739,54	326,85
2013	440,97	432,78	465,40	212,78	759,52	660,98	341,63
2014	447,35	449,70	473,00	211,05	746,04	559,62	338,98
2015	432,31	433,02	445,51	175,49	681,50		334,61
2016	467,25	432,22	465,46	185,72	742,74	655,22	367,31
2017	467,80	447,04	447,31	202,58	739,32	608,73	371,69

# ENERGY PERFORMANCE OF BUILDINGS AFTER INTERVENTIONS

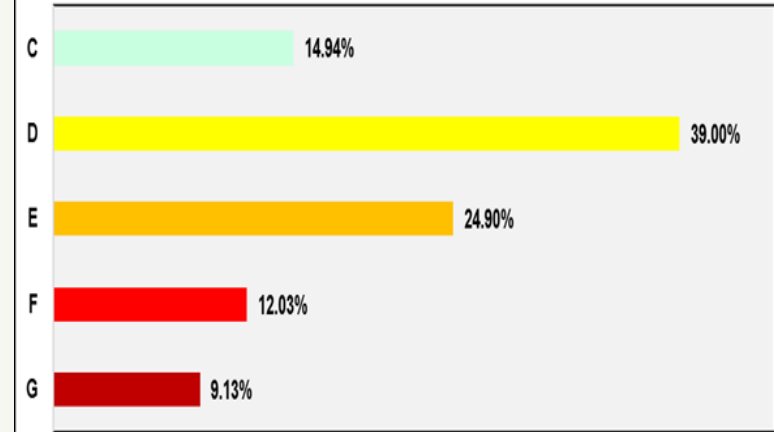
Energy Performance Asset Rating of Residential Buildings- 1st energy audit



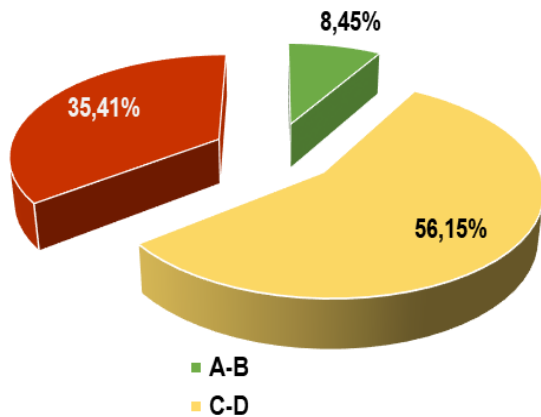
Energy Class of School Buildings - 1<sup>st</sup> Energy Audit



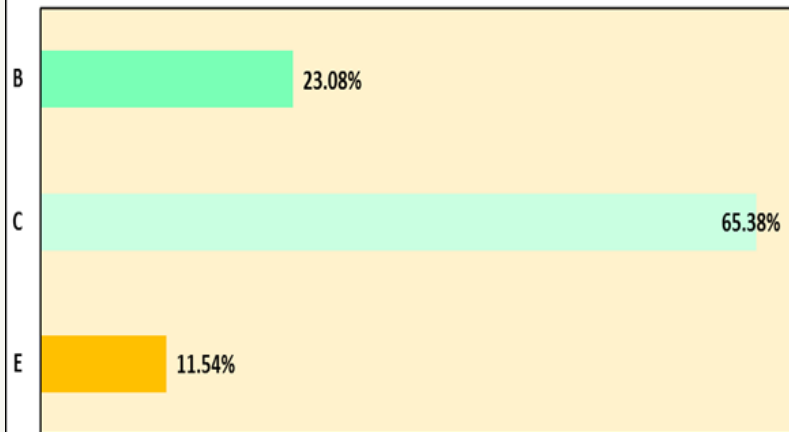
Energy Class of Public Buildings in Municipalities 1st Energy Audit



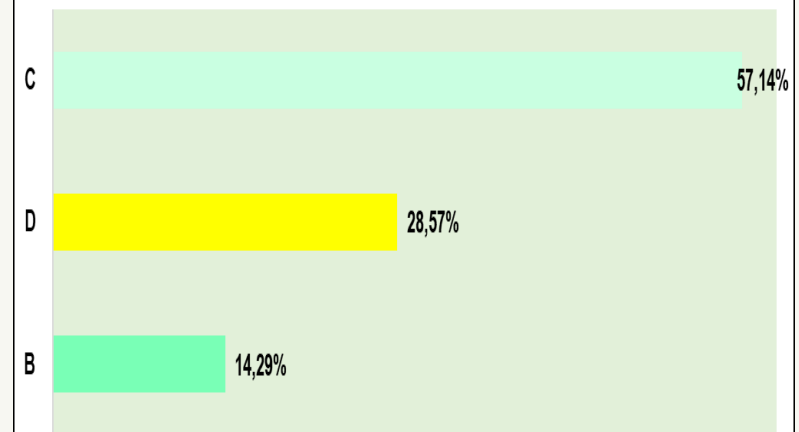
Energy Performance Asset Rating of Residential Buildings- 2nd energy audit



Energy Class of School Buildings- 2nd Energy Audit



Energy Class of Public Buildings in Municipalities 2nd Energy Audit







# PERCENTAGE OF SAVING ENERGY



CLIMATIC ZONE	CATEGORIES OF BUILDINGS	TOTAL AREA (m <sup>2</sup> )	ESTIMATED ANNUAL AVERAGE PRIMARY ENERGY CONSUMPTION OF BUILDING (kWh/m <sup>2</sup> )	ESTIMATED ANNUAL AVERAGE PRIMARY ENERGY CONSUMPTION OF BUILDING (GWh)	ESTIMATED ANNUAL AVERAGE PRIMARY ENERGY CONSUMPTION OF THE BUILDING ACCORDING TO THE REGULATION KENAK (kWh/m <sup>2</sup> )	ESTIMATED ANNUAL AVERAGE PRIMARY ENERGY CONSUMPTION OF THE BUILDING ACCORDING TO THE REGULATION KENAK (GWh)	PERCENTAGE OF SAVING ENERGY (%)
A	Commercial	2669693.143	433.08	1156.20	243.19	649.24	43.85
	Hospitals	392339.0534	410.75	161.15	274.71	107.78	33.12
	Temporary Residence	2370314.035	440.13	1043.25	256.23	607.34	41.78
	Educational	368403.238	167.41	61.67	109.23	40.24	34.75
	Sports Halls	743573.0246	729.37	542.34	454.16	337.70	37.73
	Prisons and Police Stations	3005.03	640.56	1.92	369.88	1.11	42.26
	Offices	563206.302	353.51	199.10	207.33	116.77	41.35
	Single-Family House	3911994.649	254.05	993.82	95.33	372.94	62.47
Multi-Family House	7765713.226	191.63	1488.14	87.97	683.13	54.10	
B	Commercial	9906443.659	451.86	4476.32	256.41	2540.14	43.25
	Hospitals	991942.214	441.31	437.76	288.00	285.68	34.74
	Temporary Residence	1404196.855	510.14	716.34	288.01	404.42	43.54
	Educational	1520058.749	190.46	289.51	121.18	184.21	36.37
	Sports Halls	2335469.799	760.92	1777.12	469.72	1097.02	38.27
	Prisons and Police Stations	110608.35	675.86	74.76	433.00	47.89	35.93
	Offices	7138260.822	353.45	2523.00	218.92	1562.72	38.06
	Single-Family House	7914336.098	332.92	2634.87	113.12	895.25	66.02
Multi-Family House	39305720.98	222.16	8732.24	95.50	3753.66	57.01	
C	Commercial	5021449.769	459.11	2305.38	250.62	1258.49	45.41
	Hospitals	961530.1345	441.45	424.47	285.08	274.12	35.42
	Temporary Residence	1100617.708	442.57	487.10	268.37	295.37	39.36
	Educational	877471.398	223.63	196.23	125.34	109.98	43.95
	Sports Halls	1276550.596	780.69	996.59	455.88	581.95	41.61
	Prisons and Police Stations	35482.53	528.31	18.75	418.02	14.83	20.88
	Offices	1618577.923	358.08	579.58	217.20	351.56	39.34
	Single-Family House	5237154.188	444.80	2329.49	146.40	766.74	67.09
Multi-Family House	18864187.55	285.75	5390.37	129.24	2438.01	54.77	
D	Commercial	437519.7525	493.15	215.76	249.77	109.28	49.35
	Hospitals	78938.814	420.92	33.23	286.05	22.58	32.04
	Temporary Residence	49328.13	752.37	37.11	366.63	18.09	51.27
	Educational	84370.74	243.65	20.56	119.90	10.12	50.79
	Sports Halls	144077.595	822.84	118.55	474.51	68.37	42.33
	Prisons and Police Stations	926.4	1,586.60	1.47	493.70	0.46	68.88
	Offices	114632.108	375.33	43.02	208.94	23.95	44.33
	Single-Family House	876510.3971	496.77	435.42	156.52	137.19	68.49
Multi-Family House	1873273.308	314.10	588.40	133.43	249.95	57.52	

# CONCLUSIONS



The potential for energy savings in Hellenic buildings is quite high. The correct identification of the energy demands of buildings and the necessary interventions can lead to maximizing energy savings. Energy saving can actually be a **development pillar**.



The implementation of properly designed economic measures and actions can contribute to even further more significant reductions in the cost of energy consumed and the resulting emissions in the field of buildings, but also in tackling **energy poverty**.



Energy saving measures are more **economically attractive** than today's increase in energy costs (oil, electricity).

## Finally.....

The benefits of insulation and efficiently heating of homes of people in poverty are :

- having more energy
- being able to move about more easily
- going to the doctor less often
- sleeping better
- feeling less anxious
- being more interested in getting out and about
- much less energy is wasted
- Increase in their indoor temperatures to levels approximating World Health Organisation standards for health and safety
- People's money after improvements pays for comfort and a home which can be enjoyed.



MINISTRY OF ENVIRONMENT & ENERGY

<http://bpes.ypeka.gr>

# “STATISTICAL DATA OF HELLENIC BUILDINGS”



ΥΠΟΥΡΓΕΙΟ ΠΕΡΙΒΑΛΛΟΝΤΟΣ & ΕΝΕΡΓΕΙΑΣ

ΥΠΟΥΡΓΕΙΟ | ΠΡΑΣΙΝΗ ΑΝΑΠΤΥΧΗ | ΠΕΡΙΒΑΛΛΟΝ | ΕΝΕΡΓΕΙΑ | ΚΛΙΜΑΤΙΚΗ ΑΛΛΑΓΗ | ΥΔΑΤΙΚΟΙ ΠΟΡΟΙ | ΔΑΣΗ | ΕΠΙΘΕΩΡΗΣΗ |

ΧΩΡΟΤΑΞΙΑ & ΑΣΤΙΚΟ ΠΕΡΙΒΑΛΛΟΝ | ΧΡΗΣΙΜΕΣ ΣΥΝΔΕΣΕΙΣ | ΔΗΜΟΣΙΑ ΔΙΑΒΟΥΛΕΥΣΗ | ΕΘΕΛΟΝΤΙΣΜΟΣ | ΕΠΙΚΟΙΝΩΝΙΑ |



- ΕΠΙΘΕΩΡΗΣΗ ΠΕΡΙΒΑΛΛΟΝΤΟΣ
- ΠΕΡΙΒΑΛΛΟΝΤΙΚΗ ΕΥΘΥΝΗ
- ΕΝΕΡΓΕΙΑΚΗ ΕΠΙΘΕΩΡΗΣΗ
  - ΝΟΜΙΚΟ ΠΛΑΙΣΙΟ
  - ΥΠΗΡΕΣΙΕΣ
  - ΜΗΤΡΩΟ ΕΝΕΡΓΕΙΑΚΩΝ ΕΠΙΘΕΩΡΗΤΩΝ
  - ΑΡΧΕΙΟ ΕΠΙΘΕΩΡΗΣΗΣ ΚΤΙΡΙΩΝ
  - ΑΠΟΤΕΛΕΣΜΑΤΑ ΕΛΕΓΧΩΝ
  - ΣΤΑΤΙΣΤΙΚΑ ΑΠΟΤΕΛΕΣΜΑΤΑ
  - ΕΠΙΘΕΩΡΗΣΗ ΔΟΜΗΣΗΣ & ΚΑΤΕΔΑΦΙΣΕΩΝ
  - ΕΠΙΘΕΩΡΗΣΕΙΣ ΜΕΤΑΛΛΕΙΩΝ

ΕΠΙΘΕΩΡΗΣΗ » ΕΝΕΡΓΕΙΑΚΗ ΕΠΙΘΕΩΡΗΣΗ » ΣΤΑΤΙΣΤΙΚΑ ΑΠΟΤΕΛΕΣΜΑΤΑ

## ΣΕΠΔΕΜ

Σώμα Επιθεώρησης Περιβάλλοντος, Δόμησης, Ενέργειας και Μεταλλείων

ΣΤΑΤΙΣΤΙΚΑ ΑΠΟΤΕΛΕΣΜΑΤΑ ΓΙΑ ΤΗΝ ΕΝΕΡΓΕΙΑΚΗ ΑΠΟΔΟΣΗ ΚΤΙΡΙΩΝ ΟΙΚΙΑΚΟΥ, ΤΡΙΤΟΓΕΝΟΥΣ ΤΟΜΕΑ ΚΑΙ ΔΗΜΟΣΙΩΝ ΚΤΙΡΙΩΝ



ΑΡΧΙΚΗ | ΣΤΑΤΙΣΤΙΚΑ ΑΠΟΤΕΛΕΣΜΑΤΑ | ΝΕΑ | ΠΑΡΟΥΣΙΑΣΕΙΣ | ΧΡΗΣΙΜΕΣ ΣΥΝΔΕΣΕΙΣ | ΕΠΙΚΟΙΝΩΝΙΑ

### ΑΡΧΕΙΟ ΣΤΑΤΙΣΤΙΚΩΝ ΑΠΟΤΕΛΕΣΜΑΤΩΝ

Επιλέξτε Περιφέρεια ή Περιφερειακή Ενότητα από τον Χάρτη



### Επιλογή Αρχείου Στατιστικών Αποτελεσμάτων

- Στατιστικά Επικράτειας
- Στατιστικά Περιφέρειας
- Στατιστικά Περιφερειακής Ενότητας

\* Επιλέξτε Κατηγορία

Να αποσταλεί και στο email μου σύνδεσμος των αρχείων

Δημιουργία Αρχείων



Εκθεση Στατιστικής Ανάλυσης ΠΕΑ Κτιρίων Έτους 2015



Energy Performance Of Buildings Certificates: Statistical Analysis For 2015



Εκθεση Στατιστικής Ανάλυσης ΠΕΑ Κτιρίων Έτους 2016





**Thank you for your attention**