The role of ESCOs in improving energy efficiency

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Why EPC projects are not implemented in Greece

- Improving energy efficiency has never been a priority for investment such as RES.
- Until today, the renovation of 3% of the surface of public buildings has not begun (obligation from 1.1.2014 according to Law 4342/2015). There are still legal problems with the implementation of EPC.
- Businesses do not have access to specific funding for these projects. EPC is not considered as a guarantee and the assessment of investments is problematic. Practices applied abroad are not adopted (e.g. KfW special financing terms depending on the percentage of energy savings, repayment period, etc.). Funding should not be limited to “Exoikonomo kat’ oikon”.
- Although energy utilities are obliged to reduce their annual sales volume by 1.5% through the promotion of energy efficiency improvement measures. Their current strategy to reach the target is done by means of communication actions (brochures, instructions, etc.)
- ESCOs (those that are not energy utilities or equipment suppliers) are not willing to finance energy efficiency projects, because they limit the number of projects they undertake. Accounting wise, will be loss-making companies until the repayment of each investment.
- Although that, the obligation for enterprises to carry out energy audits (Law 4342/2015) can lead to projects with EPCs.

Implementation of EPC projects from 2015 to the present Public Sector

European Union

- Different approaches from country to country.
- Most of the projects implemented with the support of European and / or national subsidies and / or facilitations (e.g. funding maturation studies).
- A major advantage is the easier access to sources of finance due to the financial solvency of the public sector.

Greece

- Until 2015, there were no projects due to barriers of the regulatory framework for public tenders.
- Law 4342/2015 now provides the possibility of assigning an energy service project in the public sector.
  - Call for tenders for the provision of an EPC service-type contract to municipal street lighting projects through the allocation of revenue from municipal fees.
  - Implementation of an energy lighting upgrading project in CRES with an EPC contract.

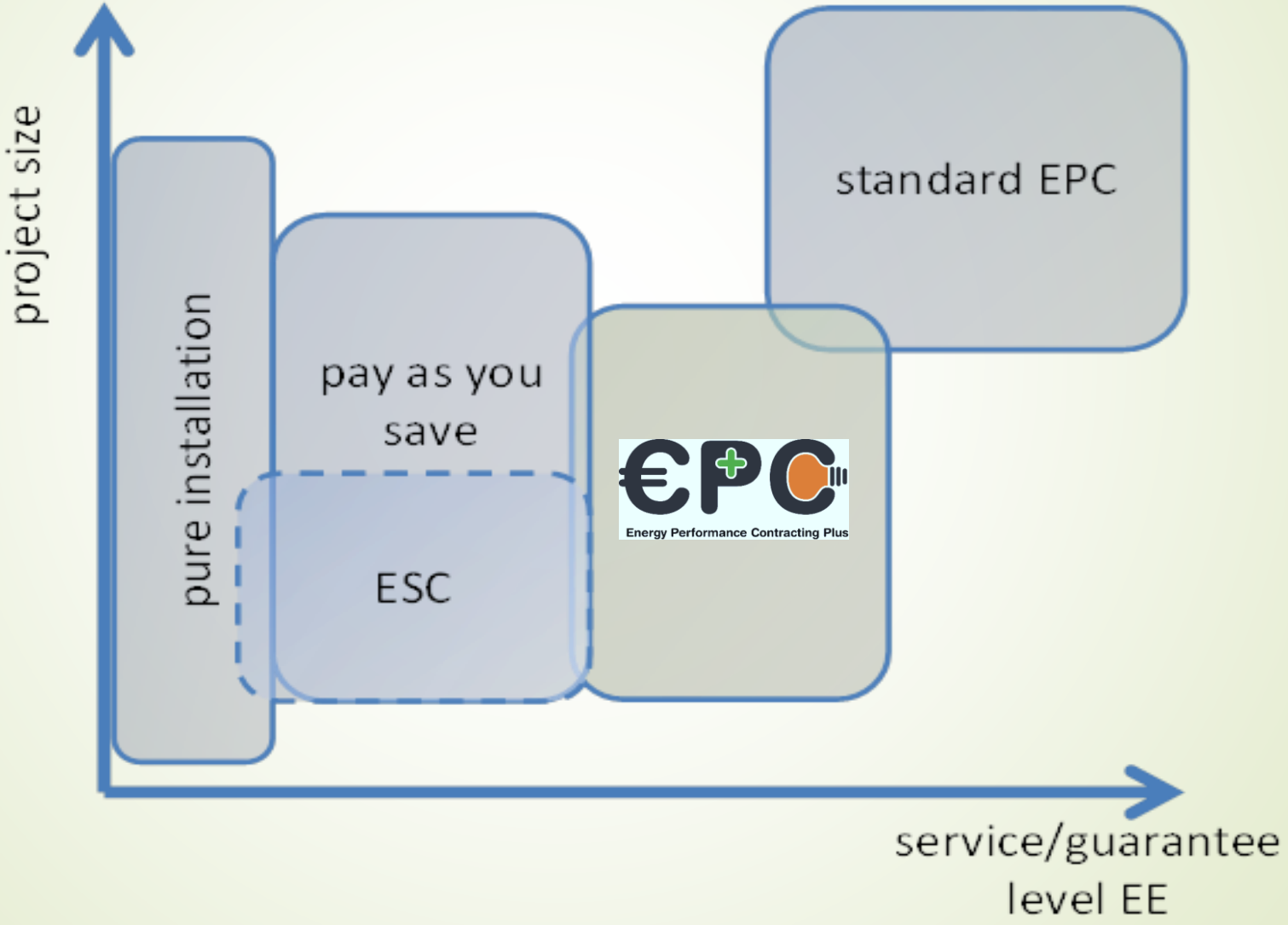
Implementation of EPC projects from 2015 to the present Private Sector

European Union

- **Standard EPC** – All projects implemented so far, have been financed mainly from the client. In these cases, the ESCO's risk is related to its **remuneration** which is linked to the achievement of guaranteed energy savings
- Where **Third Party Financing** (TPF) projects were implemented, the energy performance guarantees were from zero to low, e.g.
  - **Pure Installation** – Simple commission (with supplier's credit) repayable through installments regardless of energy saving.
  - **Energy Supply Contracts (ESC)** – (selling energy from PV, solar thermal, cogeneration etc)
    - while reducing conventional fuel and / or electricity consumption, in most cases, they are not accompanied by energy saving measures.
  - **"Pay as you save" contracts** – investment is repaid by energy savings, but in most cases there is little guarantee of energy savings and of the final payback period.

EPC+ Project Outcomes

Market Gap


project size
pure installation
pay as you save
ESC
standard EPC
€PC
Energy Performance Contracting Plus
service/guarantee level EE

The value added of the €PC project

- **Standardization** - Creation of tools at Technical, Economic and Legal level
  - A technical toolbox for any kind of selected intervention (e.g. measurement and verification methodology, links to available tools for dimensioning and / or simulation) supports the communication between market actors
  - Creation of an economic toolkit for assessing the financial viability of a project .
  - Simplified EPC model contract with the option of adding relevant (ready-to-use) articles depending on how the project is financed.
- **National Partnerships** - Promoting cooperation among companies specialized in energy efficiency.
- **European Partnerships** - Creation of an international platform for cooperation between partnerships

www.epcplus.org

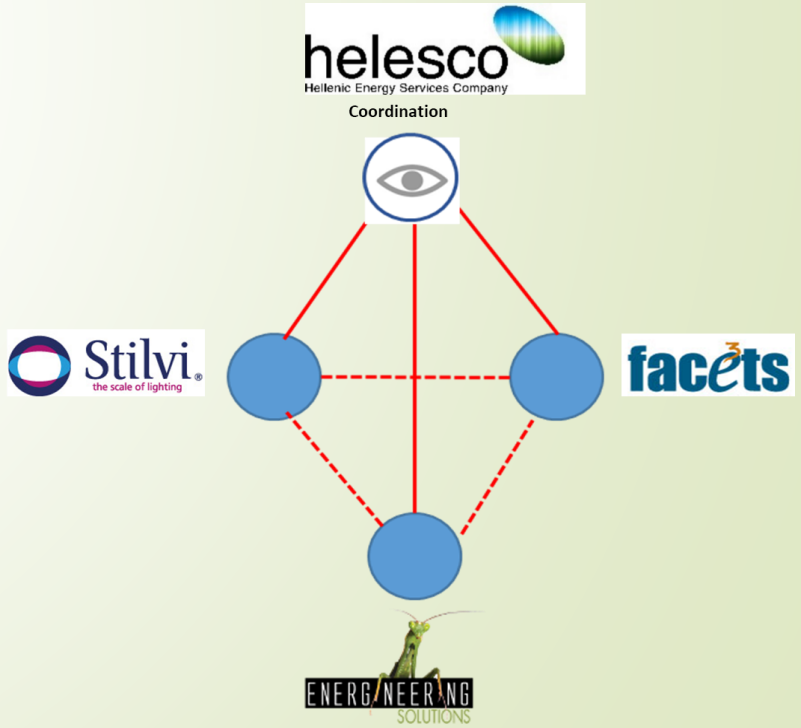
www.energyefficiencynetwork.eu

Implemented projects

- **Small and medium-sized enterprise partnerships –**
  - A total of 19 partnerships were set up in the 11 countries that participated in the project.
  - 28 pilot / demonstration projects were implemented
  - Approximately € 3.3 million was leveraged into the private sector as a direct result of the project
  - As a result of the pilot / demonstration projects, approximately 2.4 GWhel / year and 6.7 GWhth / year are saved

Characteristics of Greek Partnership

- Creation of a virtual network of companies having high expertise and experience that can compete larger companies, while maintaining the low fixed operational costs of an SME and its flexibility. Helesco SA, is the coordinator of the partnership activities.
- helesco SA and its partners are already present on the market in their field of expertise. The services we provide together are complementary and not competitive. The partnership aims at long-term cooperation.
- The precondition for achieving the objectives of the partnership is either to have a mature or a maturing market in Energy Services.



Partnership Services – The European example

Partnerships of Small and Medium-sized European Enterprises

- Mandatory energy audit compliance support
- Energy efficiency audits in each EU member state
- Measurement and Verification of energy savings
- Implementation of energy monitoring systems
- Implementation of energy management systems (ISO 50001)
- Support in voluntary public private programs
- Energy performance contracting services
- Financing of energy efficiency investments.

Energy Services at parabita retail store with an Energy Performance Contract

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Project Characteristics

- The special importance of the project lies in the fact that, three years ago, the store had undergone a technological upgrade of its lighting using LED light sources.
- In the case of this project, the energy saving was the opposite opportunity for the aesthetic upgrading of its lighting, for a shop with LED light sources.
- The project is innovative because it was not based on the usual replacement of old technology equipment but mainly on selected optic comfort optimization interventions whose higher energy efficiency rendered economically viable

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Implementation Stages of the project

- Presentation of proposals for upgrading energy services
  - Preliminary Agreement
- Energy Audit
  - Calculation of energy consumption in lighting, air conditioning and other equipment
- Proposals for implementation of innovative energy-saving measures for lighting
  - Calculation of energy savings and benefits of energy services
- Agreement and Sign-off Energy Performance Contract
- Implementation of the project
  - Project Financing
  - Supply and Installation of equipment
  - Documentation and verification of results
  - Maintenance of new equipment
  - Repayment of the project gradually based on energy savings

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Energy Audit

- Recording of existing equipment, operating times and conditions
  - Electricity consumption measurements (daily profile)
- Electricity bills
  - Frequency of sending bills (not regular)
- Shop operation profile
  - Daily / Weekly / Annual
- Climate data
  - Average Daily Temperature
    - HDH – Heating Degree Hours per day
    - CDH – Cooling Degree Hours per day
- Calculation of Annual Electricity Consumption in lighting, air conditioning, other equipment
- Calculation of Energy Savings

Regression Statistics	
Multiple R	0.9871
R Square	0.9743
Adjusted R Square	0.8241
Standard Error	272
Observations	10

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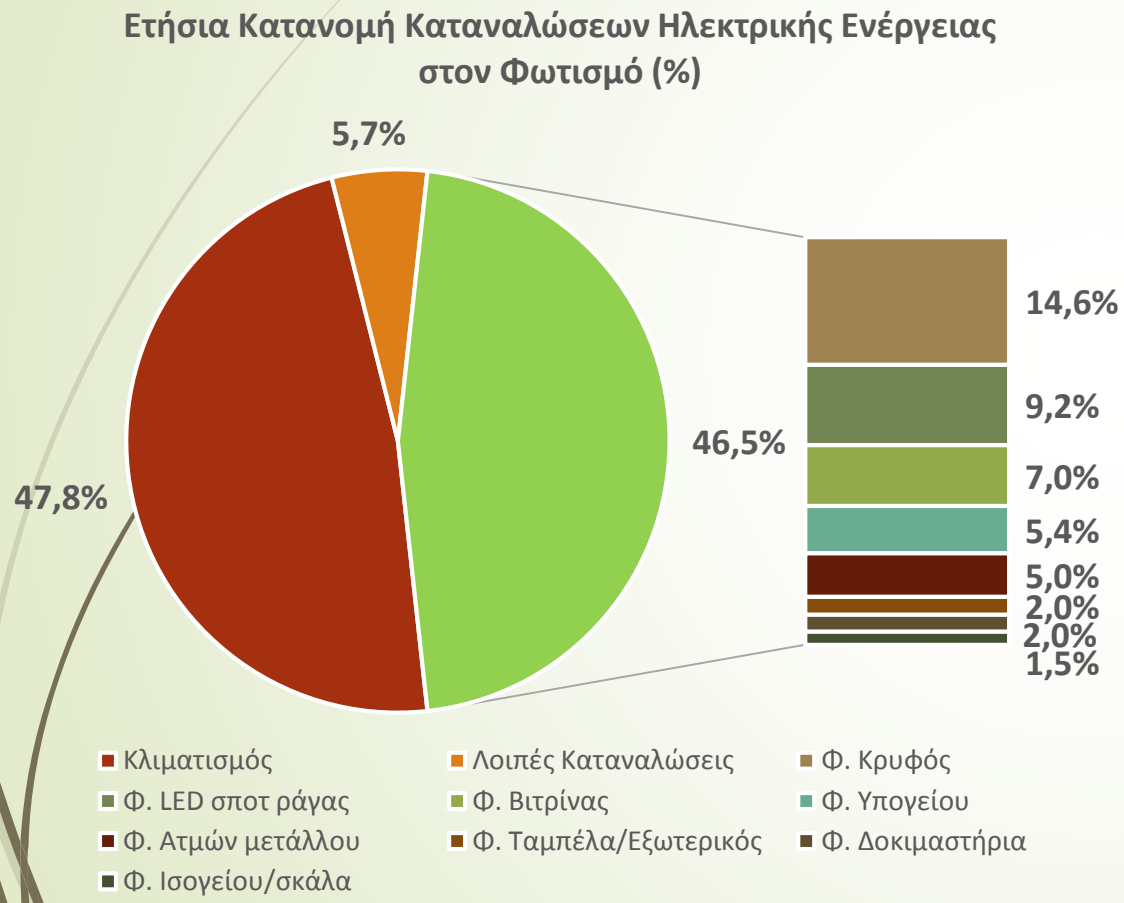
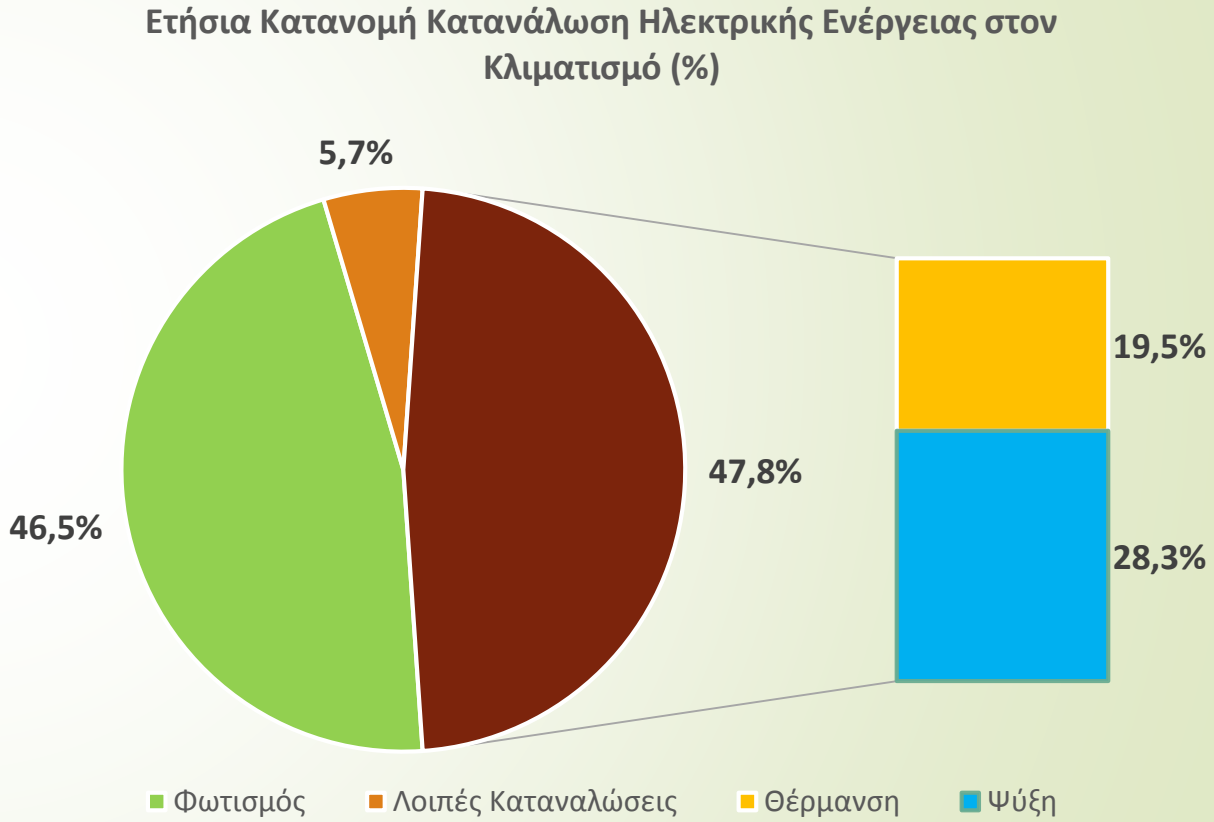
Energy Audit Indicative Results





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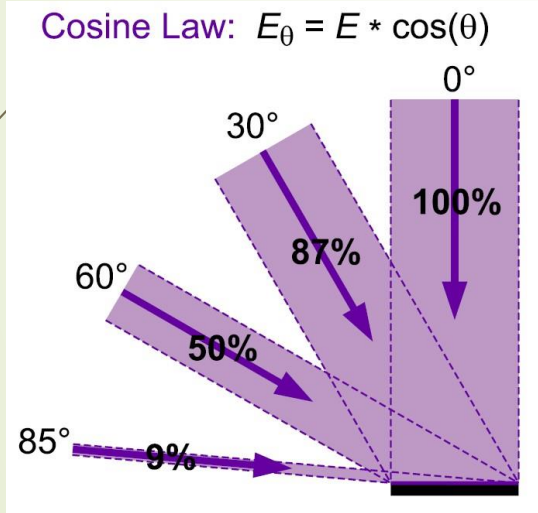
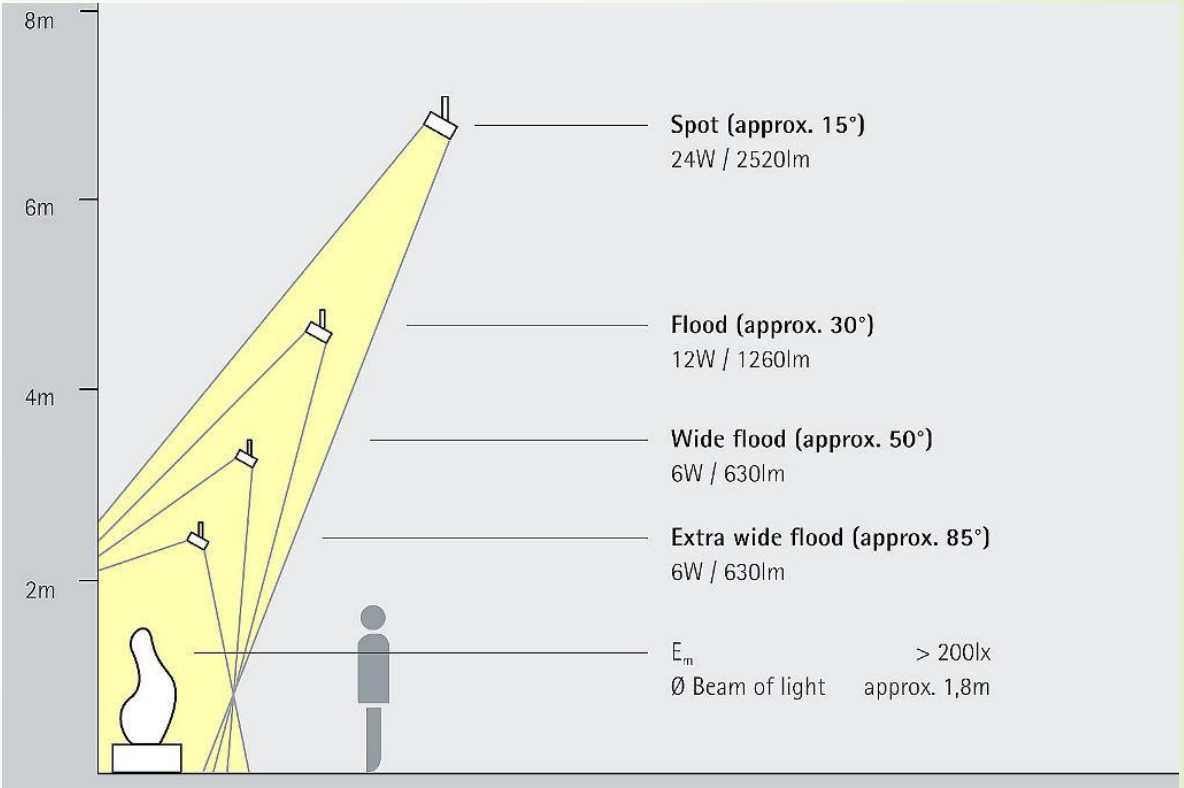
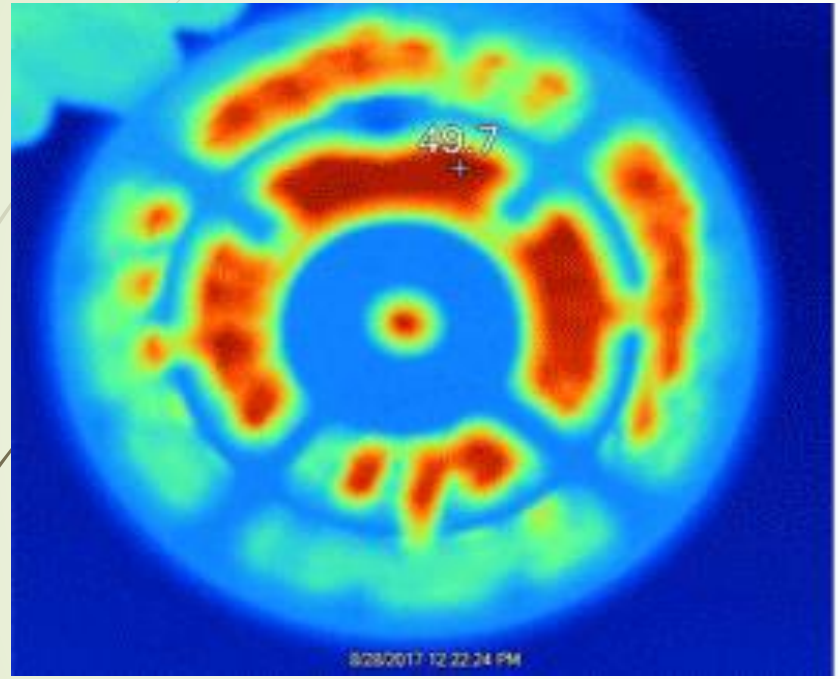
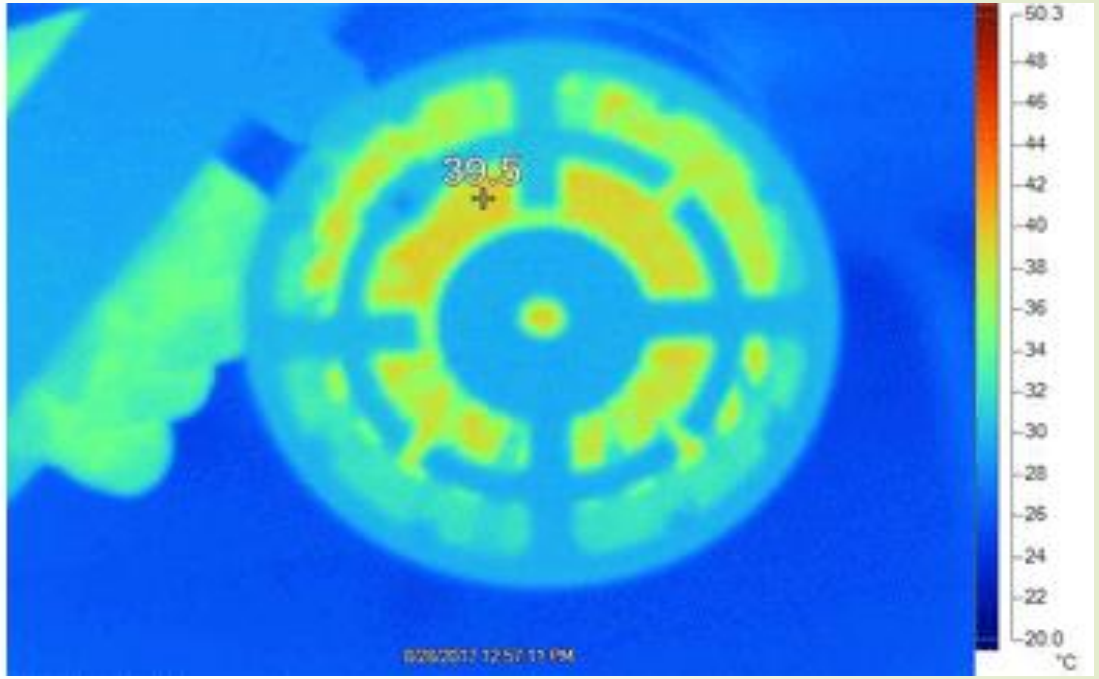

Cosine Law: $E_\theta = E * \cos(\theta)$
0°
30°
60°
85°
100%
87%
50%
0%


8m
6m
4m
2m
Spot (approx. 15°)
24W / 2520lm
Flood (approx. 30°)
12W / 1260lm
Wide flood (approx. 50°)
6W / 630lm
Extra wide flood (approx. 85°)
6W / 630lm
E_m > 200lx
Ø Beam of light approx. 1,8m

Intervention to Existing LED Lights





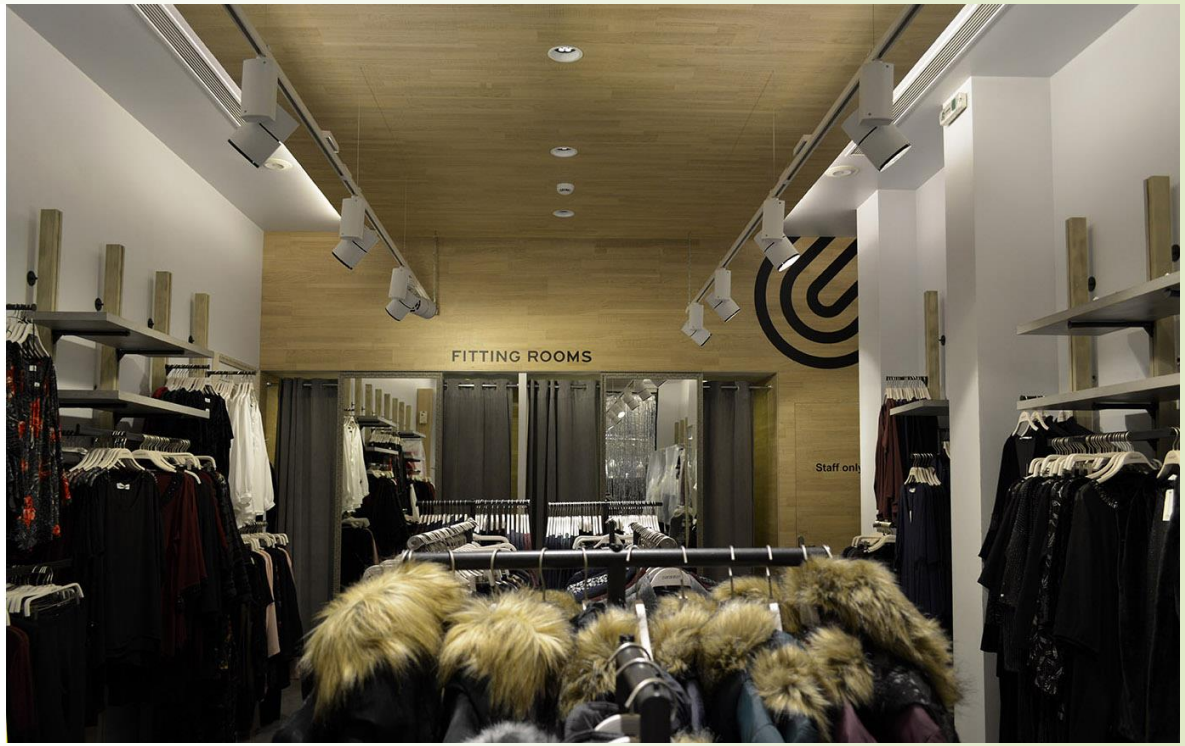
Before $T_{heatsink}$=49,7°C

- Decrease in Power Absorbed
- Decrease of the temperature in heatsinks
- Reduction in maintenance costs

After $T_{heatsink}$=39,5°C

- Increase of the LEDs light output
- Increase of useful working hours
- Residual value of the luminaires removed

Before
6676 kWh/annum



After
3068 kWh/annum

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Market research in Small and Medium Sized Enterprises

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Market Research Characteristics in Commercial SMEs

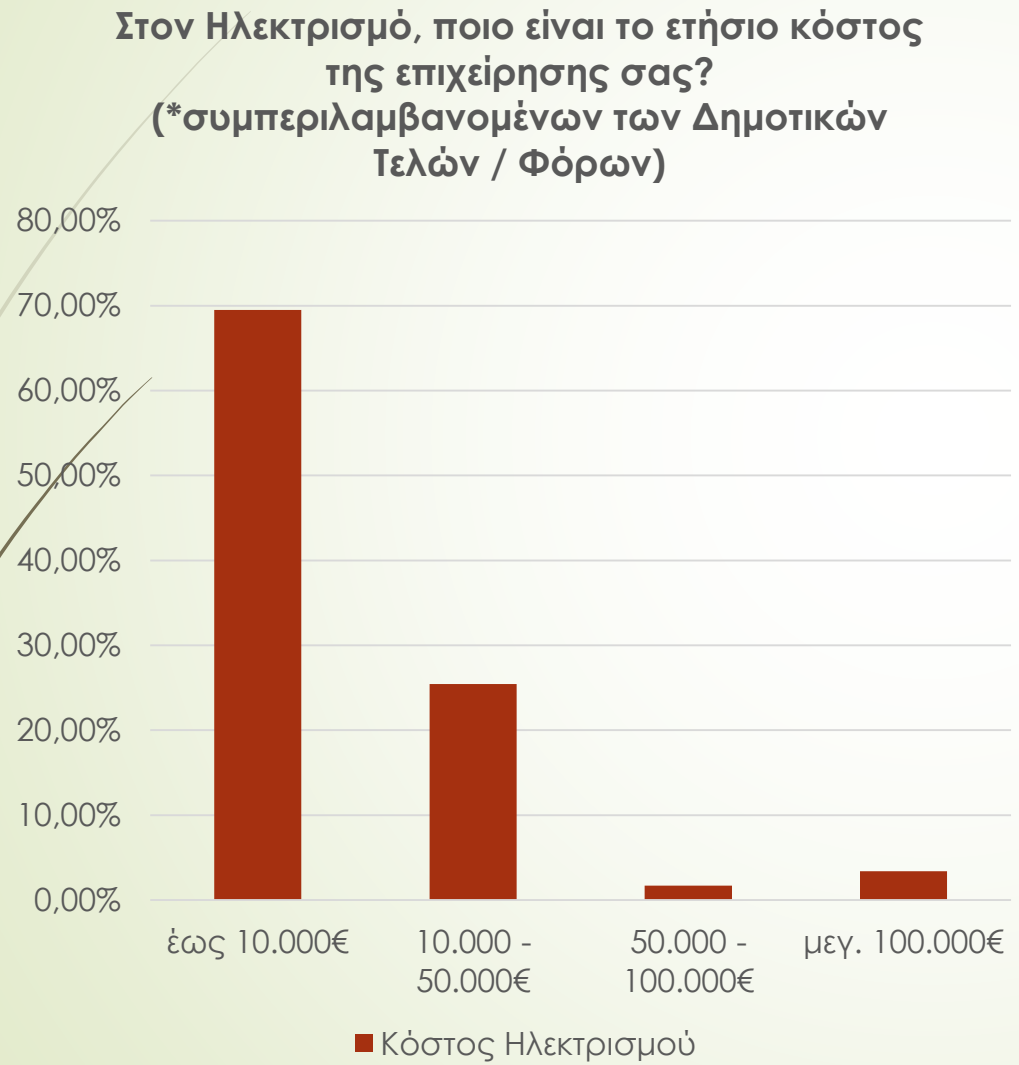
Questions about:

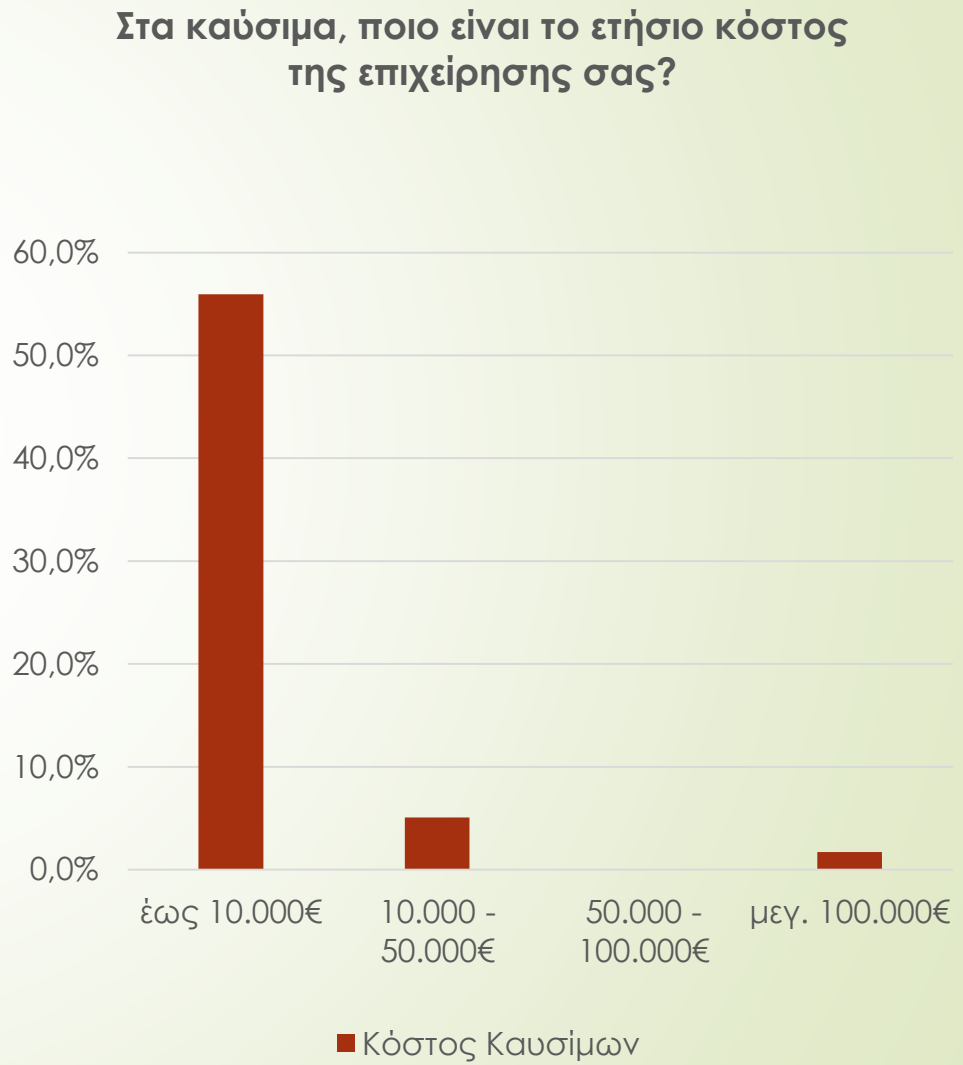
- Activity sector
- Energy Consumption
- Effectiveness of existing equipment
- Needs Identification

Sample

- 540 personal emails out of which 39 responded

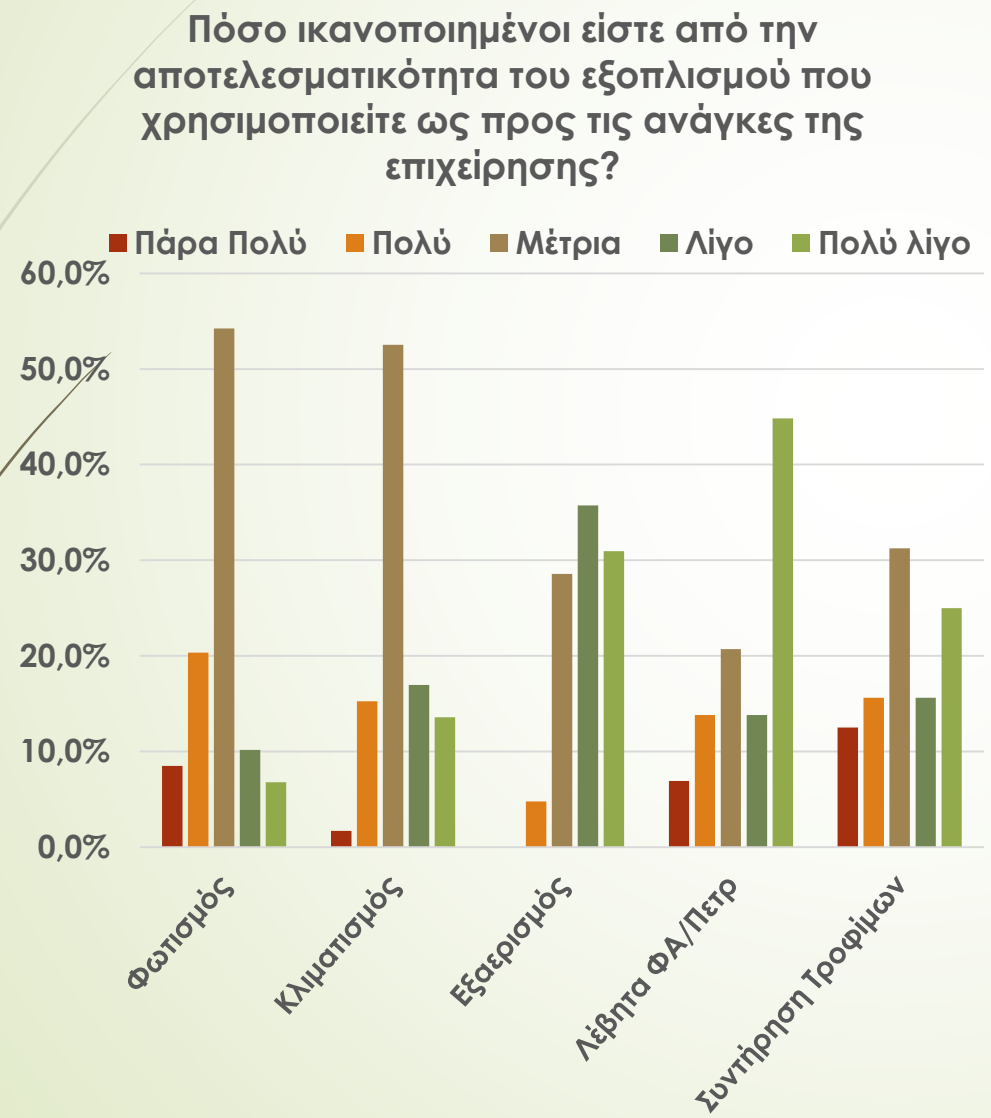
SME Market Research

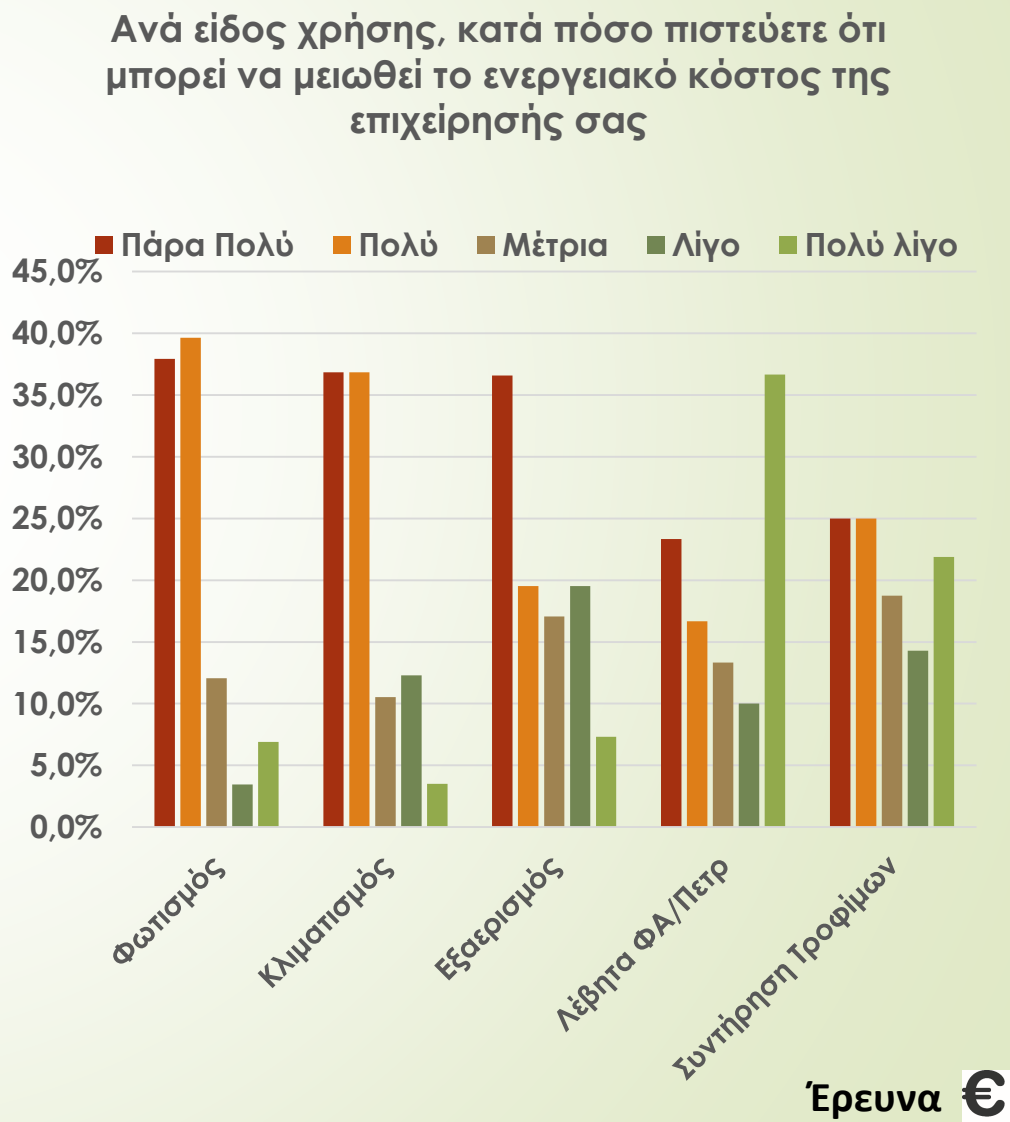




Έρευνα

SME Market Research





Έρευνα

The role of ESCOs in improving energy efficiency

The precondition for ESCOs, in improving energy efficiency, requires investment to be prioritized towards Energy Efficiency projects

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