Greece Street Lighting Framework
Technical scoping for ESCO LED street lighting PPP project

Terms of Reference

1. BACKGROUND

Street lighting systems in Greece are typically using out-dated technology which is energy inefficient and lacks modern control systems. This leads to expensive energy bills and to high maintenance costs as bulbs need to be changed frequently and require regular monitoring.

With the economic crisis, municipalities have seen their revenue decrease and are trying to implement efficiency measures. Modern street lighting solutions bring benefits from this point of view as they provide greater amount of illumination with lower energy costs. Modern systems may induce energy and O&M savings reaching up to 50-70 per cent of the pre-existing running costs.

Despite austerity, Greek municipalities have to invest to renew their infrastructure. Good street lighting promotes safety, but also plays a role in shaping the image and attractiveness of a city at night. This is important as tourism is a major source of revenue for Greece.

Given the current budgetary constraints municipalities are not in a position to invest directly, and the solution envisaged by the Greek authorities is based on the experience developed in other European countries with the selection by tender of a private company to design, implement, finance and operate street lighting. Street lighting is contractually outsourced to the private company, with payment linked to the performance achieved. An ESCO approach will be explored.

Municipal taxes for street lighting, street cleaning and waste collection are paid through regular electricity bills issued by the Greek electricity utility, Public Power Corporation (“PPC”). It is envisaged that the revenues from this tax will be pledged or ring-fenced as a security for financing the projects.

The European Bank for Reconstruction and Development (the “EBRD” or the “Bank”) is looking to select a consultant to undertake the development/preparation, in up to three cities or regions, of the technical baseline required to undertake the tendering out of such street lighting ESCO-PPP project. Such technical baseline shall include all the technical information on the existing street lighting system of the considered city/region required to allow the competent authorities to organise a tender for an ESCO-PPP project. Such technical baseline should be sufficiently complete and detailed to enable the bidders to establish their technical and financial proposal in a timely and efficient manner.

The Municipalities of Piraeus and Chania (the “Municipality” or together “the Municipalities”) have been identified as the first two cities: they both wish to launch tenders for the upgrade of their street lighting systems, under a concession/PPP type
of arrangement. PPP project scope will be precise in the course of the project preparation: options to include the supply and set-up of a smart control and metering system (optimising O&M costs) and/or the burying of some cables used for electricity distribution in a few key areas of the city (improving the aesthetic and touristic appeal of the City) will be reviewed. The use of photovoltaic systems will also be explored. The current level of technical information already available for each city will be provided to the Consultant.

The financing structure will be that of public private partnerships ("PPP"), probably with a project company being created by the winning bidder, possibly taking over certain service obligations (e.g. maintenance).

It is the intention, in a parallel and separate assignment, to develop a template tender and contractual documentation tailor made to the Greek context and technical/legal/institutional environment. Such template will be developed in coordination with the Greek PPP centre and aims at becoming the Street lighting standard tender and contractual documentation, which can be used in other cities/regions in Greece.

2. OBJECTIVES

The objective of this assignment is to prepare the technical baseline study for street lighting infrastructure in up to 3 cities (third yet to be identified). This technical baseline study will include conducting a technical scoping of the existing street lighting system so as to prepare the technical documentation necessary for organising the selection by the Municipality of a private sector partner to implement and operate the street lighting project on the basis of a PPP scheme.

The content and consistency of the deliverables of such technical baseline study should be fairly standard and correspond to the tender approached set in the template tender and contractual documentation mentioned above.

3. SCOPE OF WORK

THE FOLLOWING WILL BE UNDERTaken IN EACH MUNICIPALITY

Current technical baseline

This first stage will consist in collecting or producing sufficient technical information to develop the necessary understanding of the condition and performance of the street lighting system of the municipality in order to (i) provide for the information to develop the PPP structure business case and (ii) develop the technical data package needed to organise a proper tender.

1. Detailed asset inventory of the street lighting system of the Municipality.

The Consultant shall aggregate all the technical information in a data base (DB): the format of the data base shall be using an open format easily manageable by the Municipality but also by potential bidders. As much as possible, each element of the street lighting system shall be characterised individually in the data base.
Such inventory/DB is expected to include quantity, age, current condition, main technical parameters, and type of the assets. The inventory should group all streets in categories based on type of street (main corridor, residential lighting, parks, etc.). For each asset of the street lighting system, the consultant shall strive collecting the following piece of information:

**Basic asset information**
- Unique asset reference number
- Street name and location
- Geographical coordinates
- Road classification

**Geometric data:**
- Distance between of columns
- Height of columns
- Road width/Footpath

**Asset/equipment details:**
- Ownership
- Mounting style
- Column type, material, manufacturer
- Lantern type, nominal power, manufacturer
- Lamp Type, nominal power, manufacturer
- Control gear type, manufacturer
- Feeder post/cabling detail
- Accessories if any

**Cables:**
- Length
- Type of laying
- Condition

**Cabinets, switches:**
- Specification
- Manufacturer
- Annual operating hours (electromechanical clocks, astronomical clocks, photocells, ...)
- Condition.

**Ages/Dates for each element:**
- Original installation date
- Column age (if different)
- Lantern age/installation date
- Lamp age/installation date
- Control gear age/installation date
- Cabling age/installation date

**Standards for cable laying and trenches:**
- depth and security standards.

The inventory/DB should be supplemented by some photographs and graphics. These data will be sorted by cabinet and location/street name.
2. Analyse, to the extent possible, and comment on the current street lighting system and its maintenance, institutional set up, legal practices, standards, suggest areas for improvements, and provide the guidelines for the involvement from the private sectors under the new Project;

3. Collect and analyse data on electrical consumption of the current street lighting systems of the Municipality;

4. Collect and analyse data on the operation and maintenance costs borne by the Municipality to operate and maintain its street lighting system. The Consultant should describe the maintenance system established by studying the following:

   - Annual budget dedicated to maintenance (preventive and / or corrective)
   - Staff and qualifications
   - Operational organization of lighting management
   - Organizational set-up
   - Training program (if any)
   - System of preventive and corrective maintenance
   - Equipment and vehicles
   - Annual investment in network renewal and upgrade
   - Network Inventory, database
   - Remote Management System

5. Review standards of decommissioning of old street lighting equipment in Greece and evaluate typical decommissioning costs;

**Street lighting system upgrade - Scenarii development**

6. On the basis of the analysis of the Current technical baseline, the Consultant shall identify areas of energy efficiency improvement for the street lighting system. It shall highlight the energy saving potential and its impact on the annual lighting bill of the municipality, based on a simulation using relevant software and according to European lighting standards.

7. Review and comment on the need to upgrade/replace light columns, lamp and or feeder/switches and propose realistic upgrade plan indicating approximate number of columns/lamp/switches to be upgraded/replaced with an indicative timeline;

8. Review and comment on the need to install new/additional light columns and propose realistic plan indicating approximate number of columns or new control systems to be installed, with an indicative implementation timeline (up to 5-10 years);

9. In line with the applicable standard (Greek or European), to propose street lighting standard (light quality standard: illuminance and luminance) for each category of the street in the technical and functional parameters.

10. Analyse the remote lighting control and monitoring systems available in the market, benefits and drawbacks of the usage of each of them as well as conduct costs comparison;
On the basis of the review above, the Consultant shall develop several street lighting system upgrade options, varying essentially in the extent and depth of the proposed upgrade, and define their respective scope. Proposed options have to be supported by indicative capex and opex estimates as well as resulting indicative energy savings. The Municipality will then select a preferred technical option (the “Project”).

Following the decision on the technical option, the Consultant shall:

11. Assemble and review all available relevant data, reports, designs and mapping for the proposed Project, and advise on any additional design work that may be required.

12. Prepare indicative technical specifications of the equipment and inventory to be procured during the Project implementation;

13. Develop a detailed business case for the Project, based on the OPEX and CAPEX estimations as well as Project implementation timeline. The consultant may decide to use for this task the SEAD Street Lighting Tool (http://www.superefficient.org/). Energy saving calculations should be detailed for the Project as well as the corresponding investment plan. Preferably, the investment plan should have a payback period not exceeding 7 years.

4. IMPLEMENTATION ARRANGEMENTS AND DELIVERABLES

The duration of the assignment is a maximum of 20 weeks, subject to extension when a third city/region is identified.

The Consultant will be required to work closely with the EBRD project team in London as well as with the local EBRD office in Greece. To facilitate this, the Consultant will appoint a responsible person who shall be the main contact with EBRD and provide contact details to the EBRD. The EBRD will appoint a principal contact in the Bank for overall programme management (“EBRD Project Manager”).

The Consultant will be responsible for local travel and facilities required in other cities. All drafts and documents that shall be validated by EBRD shall be provided in English; however local communication shall be provided in Greek where appropriate.

Deliverables

All deadlines in this section use the Contract Start Date as reference point. All listed documents in this section will be provided electronically in Greek and English language. All reports should be prepared using Microsoft Word and Excel.

- **Inception Report**: Within two weeks of the Contract Start Date, the Consultant will submit (electronically) an Inception Report and the structure for the Feasibility Study. The Inception report will include a proposed work plan, any obstacles encountered to completing this assignment.
- **Technical Baseline Report** – to be submitted [8-10] weeks after the beginning of the assignment. This report shall include all the findings of task 1 to 5 as
described above. It shall also include a detailed presentation and user’s manual of the Technical DB.

- **Technical DB** – to be submitted [8-10] weeks after the beginning of the assignment.

- **An Investment Scenarii Report** submitted [12-14] weeks after the beginning of the assignment. This report will cover the activities undertaken in tasks 6 to 14 as described above. It will also include an assessment of whether the assignment has met its objectives, as well as conclusions and recommendations and areas to be addressed in the future.

- **A Final Report**, taking into accounts EBRD’s and the Municipality’s comments, shall be submitted within 30 days of the reception of these comments. This Report will consolidate both the Technical Baseline Report and Investment Scenarii Report. The Final Report should include an Executive Summary of not more than 2 pages of the major findings and conclusions that will contain no commercially confidential information.

Technical data has to be made available in such format so that a potentially different consultant could integrate the data into tender documentation.
Information specific to each Municipality:

Piraeus

1. Scope of the SL project

The project is about upgrading the energy efficiency of the street lighting network in the Municipality of Pireaus. The expected intervention will focus on the replacement of existing luminaries with high efficiency LED technology ones along with the use of smart control systems. These systems may incorporate adaptive lighting possibilities with predefined patterns (based on timing, pedestrian or vehicle presence, events, weather etc.) and telemanagement infrastructure for more dynamic wireless control. Furthermore, the project is expected to allow the wide deployment of Wi-Fi services through the new infrastructure installed on the lighting poles but also the monitoring of the city’s environmental and climate conditions through installed sensors.

- Expected annual energy savings: 4,530 MWh/year\(^1\)
- Estimated annual economic benefit: € 0.7 mil\(^2\)

a. Number of lighting points:
- According to the PM Electrical Department there are approx 13,800 lighting points (pillars and “TAS” on grid & columns) and 16,200 lamps

b. Estimation of the project CAPEX
- Depending on smart applications integration between € 6 mil - € 10 mil\(^3\)

c. Envisage contract duration
- >10 years\(^4\)

2. How are managed the current O&M on the existing street lighting system in house, outsourced? If outsourced, what are the terms/ duration of the contract?

Operation & Maintenance of the existing SL system are managed in house by the Electrical Department of the PM, consisting of 20 electricians/ workers, 3 administration officers and the head of the department. Switch on and switch off is an automated procedure of the Public Power Cooperation S.A.

3. Envisaged scope of the PPP contract

a. Simple Upgrade and O&M of the Piraeus SL System.
b. Option a + the supply and set-up of a smart control and metering system (optimising O&M costs)
c. Option b + the burying of some cables used for electricity distribution in a few key areas of the city
d. Option c or b + other “Smart City” components (please provide details)

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\(^1\) Expert’s estimation
\(^2\) Expert’s estimation
\(^3\) Expert’s estimation
\(^4\) Expert’s estimation
Piraeus Municipality is looking for option d.

Piraeus city has a population of around 163,688 people within its administrative limits (10.865 km²), making it the fourth largest municipality in Greece and the second largest within the urban area of the Greek capital, following the municipality of Athens.

The port of Piraeus, located within the urban limits of the city, is the largest port in Greece, the largest passenger port in Europe and the second largest in the world, servicing about 20 million passengers annually. The forthcoming privatization of the port’s management company (OLP S.A.) is expected to further increase the port’s growth rates through investment and management.

Towards assisting cities like Piraeus, many companies such as CISCO, OSRAM, Huawei and SilverSpring, have developed the smart lighting solutions that create Light Sensor Networks to transform luminaires into sensor-equipped, smart devices that are capable of capturing and transmitting data in near real time gathering and transmitting a wide variety of data from the environment, including levels of humidity, CO₂ and O₂, UVA and UVB light, particulate matter, motion and seismic activity, video, sound, and more.

This enables a multiple of applications and services for cities, citizens, and businesses such as:

**Lighting control and energy optimization**: focusing on improving management of lighting, energy, and maintenance for all light fixtures on the network. These applications can be accessed securely through a web browser to set such controls as occupancy-based dimming, daylight harvesting, copper-theft alerting, energy usage, savings reporting, and real-time maintenance status.

**Public safety and security**: by including video, sound, and motion-capture capabilities that enable security services management for parking lots and garages, across college and corporate campuses, and on city streets where there is a need for enhanced security. Based not only on streaming video, but also, on analyzing data at the capture point and transmit the analytics, along with alerts to a central cloud database and to the appropriate agencies based on system rules.

**Smart parking**: by gathering real-time parking availability data, those systems make this information available to parking-application providers. This data enables real-time wayfinding, dynamic pricing, and parking management, benefiting drivers, cities such as Piraeus (in terms of lessening congestion) and owners of parking facilities. By using this common infrastructure, cities can reduce the hardware cost and service fees associated with traditional smart-parking deployment using existing parking structures in malls or public parking lots, for instance, to offset street parking shortages. Lower vehicle miles traveled and carbon emissions. Optimize parking revenue through dynamic pricing.

**Environmental monitoring**: by installing environmental sensors Municipal administration can have access to real time data regarding levels of humidity, CO₂
and O2, UVA and UVB light, particulate matter, motion and seismic activity, video, sound, and more. These data could be available through an open API to academic community for research purposes and to citizens.

**Indicative Solutions**: The Smart + Connected Lighting solution offered by CISCO offers many of the above mentioned abilities being at the same time able to communicate data in real time and minimum delay. The solution relies on Distributed intelligence so that multi-sensor nodes have advanced analytics capabilities powerful enough to perform real-time video analysis on raw video streams. By using 802.11a/n Wi-Fi for local-area networking and cellular, or fiber, for data backhaul, the platform can accommodate the most data-intensive sensors. Furthermore, designed to support rich data sets, Cisco Smart + Connected City Lighting is a cloud-based architecture designed from the ground up to safeguard data. Security is layered throughout the system from node to cloud. It can evolve to support new applications and requirements over time. Applications, feature updates, and firmware upgrades are delivered easily, enabling new capabilities, enhanced functionality, and increased security.

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<tr>
<th>Item</th>
<th>Description</th>
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<tbody>
<tr>
<td>1. Central Control Unit</td>
<td>Central Control Unit that runs the software for managing all the Multi-Sensor Core Nodes of the system.</td>
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<tr>
<td>2. Data transfer via Internet</td>
<td>Achieved via using 802.11a/n Wi-Fi for local-area networking and cellular, or fiber, for data backhaul</td>
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<td>3. Multi-Sensor Core Nodes</td>
<td>e.g. The Cisco Smart + Connected City Multi-Sensor Core Node is an integral part of the Smart+ Connected City Lighting Solution — an open architecture-based light-sensory network that can be deployed along with LED luminaires</td>
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<td>4. Powerline</td>
<td>Existing Powerline Connection</td>
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<td>5. Luminaires</td>
<td>LED equipped highly energy efficient luminaires</td>
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<td>6. Sensors</td>
<td>From ibeacons to more sophisticated sensors depending on the accuracy and the available budget</td>
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4. Is there a database/GIS system of installed equipment? If so, is it comprehensive? If so, is it comprehensive? Necessary documentation of installed equipment usually required (prior tender):

There is a GIS system of installed equipment with some of SL data but **out of date** (3 or 4 years old data). Other data are provided orally and/or in writing by the head of the electrical department:
a. Nb of Columns and localisation: Type, height, material, age, conditions,
   ➢ No of Columns: Approx 7,000
   ➢ Type/material: Cast iron or iron made
   ➢ Height: n/a
   ➢ Age: Dated since 1960 up to 2010
   ➢ Condition: Medium to poor

b. Lights: Type, specification, age, conditions,
   ➢ Type:

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<td>70, 110, 80, 125</td>
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<td>4088</td>
<td>8902</td>
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<td>2 Na, Hg</td>
<td>210, 25</td>
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<td>3070</td>
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<tr>
<td>3 Na</td>
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<td>4 HQI</td>
<td>70-150</td>
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<td>5 SL</td>
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<td>10 Fluorescent</td>
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Piraeus Municipality, Electrical Department, 2014

➢ Specification: n/a
➢ Age: Various
➢ Condition: Medium to poor

c. Cables: Length, type of laying, age, conditions,
   ➢ Length: n/a, indicative annual procurement quantity for maintenance 43,000 m (43 km)
   ➢ Type of laying: Both underground in tubes and aerial
   ➢ Age: Dated since 1960 up to 2010
   ➢ Conditions: Poor

d. Cabinets, switches: No, specification, age, conditions
   ➢ Public Power Cooperation S.A. is responsible for switches/cabinets of the municipal street lighting, using an automated system of switch on/off via daylight sensors

e. Construction conditions:
   i. Lengths with percentage of different surfaces and material (soil, concrete, stone, bitumen):
   ii. Standards for cable laying and trenches: depth, security standards,
   ➢ Underground cables are located 45 cm below the surface of the streets or sidewalks, in tubes, in soil.
5. Is there Standards for decommissioning of old equipment in Greece? If so, which ones? 
N/a

6. What are the Street lighting standards in Greece

The Ministry of Infrastructure, Transportation & Networks is responsible for producing the National Technical Specifications for Public Works. The National Organization for Standardization S.A. (ELOT S.A.) translates the Specifications into Standards which are approved by a Ministerial Decision.

National Technical Specifications are revised periodically with Temporary National Technical Specifications, according to new technologies available, European directives or regulations, other factors related to public works. On January 2016 1st Rev of National Technical Specifications for Street Lighting was published for public consultation.

7. Data on the electrical consumption of Piraeus SL system for the last few years

The estimate for the annual consumption of PM SL system is 7.120 MW/h\(^5\)

8. Envisaged scope of support required by the Piraeus municipality: technical preparation, legal, financial?

PM does not have the capacity to produce all necessary documents and calculations to proceed with SL investment maturity process with its own human and other resources. Thus, technical, legal and financial support is required

**Chania:**

1. Is there a database/documentation of installed equipment? If so, is it comprehensive? Necessary documentation of installed equipment usually required (prior tender):
   a. No. of Columns and localisation: Type, height, material, age, conditions
   Number of columns is estimated at approximately 12,000. 5,000 are owned by the Municipality of Chania and 7,000 are owned by Public Power Corporation (PPC)
   The column heights are distributed as follows:
   1. 3.5 metres (60%)
   2. 7.5 metres (20%)
   3. 9.0 metres (10%)
   4. 11.0 metres (10%)

   The columns are made of the following material:
   1. Iron (Majority)
   2. Aluminum (Majority)
   3. Cast iron (Few)
   4. Cement (Very few)

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\(^5\) Expert’s estimation
5. The majority of columns owned by PPC are made of wood

The majority of columns are 12-15 years old. Very few columns are 35-40 years old.
Their shape is the following:
1. Cylinder (50%)
2. Hexagon (50%)

b. Lights: Type, specification, age, conditions
Types of existing lights are the following:

1. SL 23, 1,400 LUMEN
2. 125 mercury 6,000 LUMEN
3. CDO 70 8,500 LUMEN (50 pieces)
4. CDO 100
5. CDO 150
6. 250 W mercury
7. 400 W sodium
8. 100 LED pieces
Types 1 and 2 account for 70-80% of the municipality’s total street lights

In total, outdoor lights amount to approximately 30,000-38,000 pieces – this number refers to street lighting and the lighting of outdoor public spaces (parks etc). The lighting of public buildings is not included in these numbers.
Average age of the lights is 5-8 years as the Municipality of Chania is maintaining and replacing those lights on a regular basis.

c. Cables: Length, type of laying, age, conditions
The following type of cables are currently in place:
1. 5 x 4 NYY
2. 5 x 6 NYY
3. 5 x 10 NYY
4. 2 x 16 NYY
Type 3 (5 x 10 NYY) accounts for approx. 60% of the total cables installed.
The other types are distributed equally (circa 13% of total)

Average age of the cables is 20-25 years.
The cable network described above refers to underground cables installed and owned by the Municipality. On the length of the cables, there are no accurate estimates available – however it is estimated that the total length of the cables owned by the Municipality is less than 100km.

There are also overhead cables that are owned by PPC, however there is no information available on those cables at the moment.

d. Cabinets, switches: No, specification, age, conditions
1. Cabinets: Estimated at 300-400 pieces, average age 15 years
2. Switches: Estimated at 1,000 pieces, average age 15 years
Construction conditions: N/A
2. Is there Standards for decommissioning of old equipment in Greece? If so, which ones?
   The Municipality fully complies with existing legislation and makes use of a recycling system through a company that is responsible for transporting and decommissioning old equipment.

3. What are the Street lighting standards in Greece?
   N/A

4. Data on the electrical consumption of the Street lighting system for the last few years.
   The total amount paid by the municipality for street lighting, lighting of public spaces and lighting for productive activities was in the region of Eur 1.5 million in 2015.
ΕΝΗΜΕΡΩΤΙΚΟ ΣΗΜΕΙΩΜΑ
ΣΧΕΤΙΚΑ ΜΕ ΤΗΝ ΚΑΤΑΣΤΑΣΗ ΤΟΥ ΗΛΕΚΤΡΟΦΩΤΙΣΜΟΥ ΤΟΥ ΔΗΜΟΥ ΧΑΝΙΩΝ

Σε συνέχεια της συζήτησης την οποία είχαμε στα γραφεία της EBRD σας στέλνω τα στοιχεία που ζητήσατε με βάση το ερωτηματολόγιο το οποίο μου στείλατε με email στις 9 Μαρτίου 2016. Θέλω να επισημάνω, όπως συζητήσαμε άλλωστε, ότι τα ποσοτικά στοιχεία που περιλαμβάνονται στο σημείωμα είναι κατά προσέγγιση καθώς δεν διαθέτουμε οργανωμένο σύστημα καταγραφής και απογραφής δεδομένων για αυτό το σκοπό. Τα εν λόγω στοιχεία όμως, αν και δεν είναι απολύτως ακριβή, είναι εμπειρικά και αξιόπιστα καθώς ο Προϊστάμενος και τα επιτελικά στελέχη του Τμήματος Ηλεκτροφωτισμού του Δήμου είναι εξαιρετικά καταρτισμένα και έμπειρα σε αυτόν τον τομέα.

Α. Όσον αφορά τις κολώνες (2a):

Οι κολώνες φωτισμού του Δήμου υπολογίζονται συνολικά σε 12.000 περίπου. Εξ αυτών 5.000 είναι ιδιοκτησία του Δήμου Χανίων και 7.000 είναι ιδιοκτησία της ΔΕΗ ΑΕ.

Τα ύψη τους είναι 4 ειδών:

1. 3,5 μέτρων (60%)
2. 7,5 μέτρων (20%)
3. 9,00 μέτρων (10%)
4. 11,00 μέτρων (10%)

Το υλικό κατασκευής τους είναι διαφόρων ειδών:

1. Σιδερένιες (Πλειοψηφία)
2. Αλουμινένιες (Πλειοψηφία)
3. Μαντεμένιες (Λίγες)
4. Τσιμεντένιες (Ελάχιστες)
5. Συντριπτική πλειοψηφία των κολώνων ιδιοκτησίας ΔΕΗ ΑΕ
είναι ξύλινες.

Η ηλικία των κολώνων είναι στην συντριπτική τους πλειοψηφία 12-15 ετών. Εξαιρετικά λίγες είναι οι κολώνες 35-40 ετών.

Το σχήμα τους είναι 2 ειδών:

1. Στρογγυλές (50%)
2. Εξάγωνες (50%)

B. Όσον αφορά τα φωτιστικά (2b):

Οι τύποι των φωτιστικών είναι οι εξής:

1. SL 23, 1.400 LUMEN
2. 125 ατμών υδραργύρου 6.000 LUMEN
3. CDO 70 8.500 LUMEN (50 τεμάχια)
4. CDO 100
5. CDO 150
6. 250 W ατμών νατρίου
7. 400 W ατμών νατρίου
8. 100 τεμάχια φωτιστικών LED

Οι τύποι φωτιστικών 1 & 2 αποτελούν αριθμητικά περίπου το 70-80% του συνολικού φωτισμού του Δήμου.

Το γενικό σύνολο των εξωτερικών φωτιστικών του Δήμου ανέρχεται σε 30.000 –38.000 τεμάχια και αφορούν τον οδοφωτισμό και τον φωτισμό ανοικτών δημόσιων χώρων (πάρκα, άλση κ.λπ.). Στον αριθμό αυτό δεν περιλαμβάνονται τα φωτιστικά κτιρίων κάθε είδους.

Ο μέσος όρος ηλικίας των φωτιστικών δεν ξεπερνά τα 5-8 χρόνια καθώς γίνεται συστηματική συντήρηση και αντικατάσταση από την υπηρεσία Ηλεκτροφωτισμού του Δήμου Χανίων.

Γ. Όσον αφορά τα καλώδια (2c):

Οι τύποι των καλώδιων είναι οι εξής:

1. 5 χ 4 NYY
2. 5 χ 6 NYY
3. 5 χ 10 NYY
4. 2 χ 16 NYY

Ο τύπος καλώδιων 3 (5 χ 10 NYY) είναι η μεγάλη πλειοψηφία στο Δήμο (60%), με τις υπόλοιπες κατηγορίες να μοιράζονται ισόποσα.
Ο μέσος όρος της ηλικίας των καλωδίων είναι 20 – 25 έτη. Επισημαίνεται ότι το δίκτυο καλωδίων που αναφέρεται εδώ αφορά τα υπόγεια καλώδια που έχει τοποθετήσει ο Δήμος και αποτελούν ιδιοκτησία του. Τα εναέρια καλώδια είναι όλα ιδιοκτησία της ΔΕΗ ΑΕ αντίστοιχα με τις κολώνες που ανήκουν επίσης στη ΔΕΗ.

Όσον αφορά την έκταση των καλωδίων οι εκτιμήσεις είναι εξαιρετικά παρακινδυνευμένες. Πάντως εκτιμάται ότι τα ιδιόκτητα καλώδια του Δήμου δεν ξεπερνούν τα 100 χιλιόμετρα. Αδύνατη είναι η εκτίμηση της έκτασης των καλωδίων ιδιοκτησίας ΔΕΗ ΑΕ.

Δ. Όσον αφορά τα cabinets και τα switches (2d):

1. Cabinets: Υπολογίζονται σε 300-400 τεμάχια στο δίκτυο ηλεκτροφωτισμού του Δήμου. Η ηλικία τους υπολογίζεται σε 15 έτη κατά μέσο όρο.
2. Switches: Υπολογίζονται σε 1.000 τεμάχια στο δίκτυο και η ηλικία τους είναι αντίστοιχη με τα cabinets.

Δ. Όσον αφορά τις συνθήκες κατασκευής (2e) είναι εξαιρετικά δύσκολο να δοθεί εικόνα έστω και κατά προσέγγιση.

Ε. Όσον αφορά τις προδιαγραφές απόσυρσης παλιού εξοπλισμού ηλεκτροφωτισμού (3), ο Δήμος Χανίων συμμορφώνεται πλήρως με την ισχύουσα νομοθεσία και για το σκοπό αυτό χρησιμοποιεί το σύστημα ανακύκλωσης μέσω εταιρείας η οποία αναλαμβάνει την ασφαλή μεταφορά και εναπόθεση των εν λόγω υλικών.

ΣΤ. Όσον αφορά τις προδιαγραφές οδοφωτισμού που ισχύουν στην Ελλάδα (4), δεν είμαστε σε θέση να γνωρίζουμε λεπτομέρειες.

Ζ. Τέλος, όσον αφορά τα δεδομένα ενεργειακής κατανάλωσης του Δήμου (5) για τον ηλεκτροφωτισμό, τα επίσημα στοιχεία παραδίδονται συνεχώς με το συνολικό ετήσιο κόστος συντήρησης (επιπρόσθετα με το συνολικό ετήσιο κόστος συντήρησης) κατά την διάρκεια της συνάντησης στα γραφεία της Τράπεζας στις 22/4.

Ελπίζουμε τα ανωτέρω στοιχεία να δίνουν μία καλή πρώτη εικόνα για το θέμα μας και εφόσον χρειαστεί μπορεί να επανέλθουμε με περισσότερες διευκρινήσεις με βάση τις δυνατότητες που έχει ο Δήμος Χανίων.

Με εκτίμηση,
Δημήτρης Φραγκάκης
Γ.Γ. Δήμου Χανίων