Streetlight-EPC
Implemented projects from Streetlight-EPC and other experiences from project experts

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North-West Croatia Regional Energy Agency, REGEA

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www.regea.org/EPC
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ESCO market in Croatia – today

Low level of confidence in ESCO schemes
Limited financial/technical capacity of cities/municipalities to invest (no equity)
Low electricity price – prices less than 0.11 EUR/cents (without VAT) represent major obstacle

Tested ESCO models (during S-EPC project)

Most common ESCO models in the market today:

a) **D&B** (Design and Build mode)
b) **EPC** (Energy Performance Contracting)
c) **PPP** (Public Private Partnership)
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Common ESCO denominator

Contractually guaranteed energy savings
- level of energy savings is defined and agreed upon by the client and ESCO
- level of energy savings are included in the contract

Financial consequences for the ESCO if the guaranteed savings are not met mechanisms, e.g.:
- Bank guarantee
- Withholding/reduction of the payment
- Retention of a percentage of payment
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Design and build advantages

Easiest to tender (shorter and less complex procurement process)
In case of lower finance costs for public authorities (than for ESCOs), D&B model is cheaper than EPC or PPP

EPC advantages (in Croatia)

Focuses only on EE measures – not on whole service (as in PPP)
Provides stronger Guarantees on EE measure performance (than D&B)
Incorporates only project risks in relation to EE measures
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**PPP advantages (in Croatia)**

PPP as only ESCO model that has legal and institutional framework ensuring solid contractual agreement between public authority and private partner

Incorporates more project risks – whole public lighting infrastructure

PPP ensuring clear risk allocation methodology as a key for tackling public debt issue – *off balance sheet project financing*

For bigger ESCO projects (like in Croatia – excessive deficit procedure) this could be very important
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S-EPC projects (Croatia)

Krapina-zagorje County D&B project

<table>
<thead>
<tr>
<th>Facts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population:</strong> 132,400 inhabitants</td>
</tr>
<tr>
<td><strong>Type of lighting:</strong> Indoor lighting in 3 elementary schools</td>
</tr>
<tr>
<td><strong>ESCO:</strong> Lipapromet d.o.o.</td>
</tr>
<tr>
<td><strong>Web:</strong> <a href="http://www.lipapromet.hr/">http://www.lipapromet.hr/</a></td>
</tr>
</tbody>
</table>

- **Investment costs:** 209,700 €
- **Subsidies:** 157,600 € (environmental fund)
- **EPC contract duration:** 14.25 years

- **Electricity cost savings:** 5,000 €/year
- **Reduction electricity consumption:** 28,000 kWh/year
- **CO₂ reduction:** 13 tons/year
S-EPC projects (Croatia)

Krapina-zagorje County D&B project

- Energy savings – 14.5%
- Illuminance – 36% higher
- Equity (subsidy) – 80%

<table>
<thead>
<tr>
<th>Project data</th>
<th>Before renovation</th>
<th>After renovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total installed electric capacity</td>
<td>151 kW</td>
<td>83 kW</td>
</tr>
<tr>
<td>Total number of lamps</td>
<td>2,334</td>
<td>2,242</td>
</tr>
<tr>
<td>Number of lighting points (luminaires)</td>
<td>2,334</td>
<td>2,242</td>
</tr>
<tr>
<td>Main lamp type</td>
<td>Incandescent light bulbs</td>
<td>Tubular fluorescent T5</td>
</tr>
<tr>
<td>Annual electricity consumption</td>
<td>69,900 kWh</td>
<td>41,900 kWh</td>
</tr>
<tr>
<td>Annual electricity costs</td>
<td>12,500 Euro</td>
<td>7,500 Euro</td>
</tr>
</tbody>
</table>
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S-EPC projects (Croatia)

Krapina-zagorje County
D&B project

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S-EPC projects (Croatia)

City of Vrbovec
EPC project

- **Investment costs:**
  - 866,667 € (capital costs)
  - 995,360 € (overall contract value)
- **EPC contract duration:** 7.25 years

**Facts**

- **Population:** 14,800 inhabitants
- **Type of streets:** National, regional and local
- **ESCO:** LED elektronika
- **Electricity cost savings:** 90,700 €/year
- **Maintenance cost savings:** 32,500 €/year
- **Reduction electricity consumption:** 1,215,100 kWh/year
- **CO₂ reduction:** 559 tons/year

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## S-EPC projects (Croatia)

### City of Vrbovec EPC project

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</thead>
<tbody>
<tr>
<td>Total installed electric capacity</td>
<td>352 kW</td>
<td>71 kW</td>
</tr>
<tr>
<td>Total number of lamps</td>
<td>2,247</td>
<td>2,211</td>
</tr>
<tr>
<td>Number of lighting points (luminaires)</td>
<td>2,247</td>
<td>2,211</td>
</tr>
<tr>
<td>Main lamp type</td>
<td>HPS</td>
<td>LED</td>
</tr>
<tr>
<td>Annual electricity consumption</td>
<td>1,433,400 kWh</td>
<td>218,300 kWh</td>
</tr>
<tr>
<td>Annual electricity costs</td>
<td>107,000 Euro</td>
<td>16,300 Euro</td>
</tr>
</tbody>
</table>

Energy savings – 80%
Illuminance – 13% higher
Equity (subsidy) – none
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S-EPC projects (Croatia)

City of Vrbovec
EPC project

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S-EPC projects (Croatia)

Municipality of Kostrena PPP project

- **Population:** 4,180 inhabitants
- **ESCO:** IMC
- **Electricity cost savings:** 24,000 €/year
- **Maintenance cost savings:** 20,500 €/year
- **Reduction electricity consumption:** 222,500 kWh/year
- **CO₂ reduction:** 102 tons/year

- **Investment costs:**
  - 250,000 € (capital costs)
  - 456,000 € (overall contract value)
- **Subsidies:** 85,000 € (national fund)
- **PPP contract duration:** 12 years

Co-funded by the Intelligent Energy Europe Programme of the European Union

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S-EPC projects (Croatia)

Municipality of Kostrena PPP project

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<th>Project data</th>
<th>Before renovation</th>
<th>After renovation</th>
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<tbody>
<tr>
<td>Total installed electric capacity</td>
<td>75 kW</td>
<td>27 kW</td>
</tr>
<tr>
<td>Total number of lamps</td>
<td>407</td>
<td>407</td>
</tr>
<tr>
<td>Number of lighting points (luminaires)</td>
<td>407</td>
<td>407</td>
</tr>
<tr>
<td>Main lamp type</td>
<td>HPM</td>
<td>LED</td>
</tr>
<tr>
<td>Annual electricity consumption</td>
<td>307,500 kWh</td>
<td>85,000 kWh</td>
</tr>
<tr>
<td>Annual electricity costs</td>
<td>33,200 Euro</td>
<td>9,200 Euro</td>
</tr>
</tbody>
</table>

Energy savings – 72%
Illuminance – 17% higher
Equity (subsidy) – 20%
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**S-EPC projects (Croatia)**

**Municipality of Kostrena**

PPP project

[Images of street scenes in daylight and at night]
Key findings

D&B and EPC suitable for smaller projects

Regarding capital investment volume, PPP is financially viable for projects bigger than 5 mil EUR (operating costs of SPV and risk allocated to SPV)

Quality inputs essential for ESCO models

Methodology for detailed public lighting energy audits – unique and standardized process and procedures – key for building ESCO confidence
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ESCO market players understanding the contractual models

Drafted ESCO contract and prepared tender documentation are a Key for financial sector to understand risks and possible project financing scheme

LCCA - Life Cycle Cost Analysis

EPC vs PPP – strong need for clear legislation framework (EUROSTAT, public debt)
LCCA - needs to become obligatory for all projects (ESCO and non ESCO)
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Tendering documentation needs to be custom fitted

For Energy audits and for ESCO services tenders need to be carefully prepared
Pay attention to the technical and legal details

Use GIS tools

When tendering streetlight energy audits incorporate GIS – digitalization of collected info from ground
Data collected and presented by GIS builds up confidence in ESCO market players.
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Project NEWLIGHT (ELENA) – Reconstruction of Street Lighting in 57 Croatian Cities and Municipalities
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Introduction – Main Facts

ELENA financed

REGEA – EIB contract: October 2015

Duration: 36 months

Final Beneficiaries: 57 cities and municipalities

Overall goal: Investment in reconstruction of street lighting systems, min. 20 mil eur
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Introduction – Main Facts

Total budget: 790 000 EUR (TA)

EIB co-financing: 711 000 EUR (90%)

Co-financing from regional authorities:
Zagreb County and Krapina-zagorje County 79 000 EUR (10%)

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Main Activities

Phase I – Implementation of energy audits
Subcontracting (public procurement selection)
Duration 12 months

Phase II - ESCO (PPP) documentation preparation Duration 12 months

Phase III - Public procurement for ESCO services Based on PPP methodology
Duration 12 months
Key Feature: Bundling

57 Croatian cities and municipalities
Better investment opportunity (20 mil eur)
Transaction costs lower
Risks lower (standardised methodology and procedures)
Improved access to finance

Challenges
Large (!) number of stakeholders
Project management and communication (!!!)
Long preparation and decision making
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