

STREET LIGHTING AS MUNICIPAL ENERGY SAVING PPP CONTRACT

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MUNICIPAL PPP ENERGY

SAVING

EPC - Energy Performance Contracting

ESCO - Energy Saving Company / Contract

CONTRACTS

WHY MODERNIZE STREET LIGHTING?

UN:

The United Nations Environment Programme (UNEP) - Efficient Lighting Initiative: Electricity for lighting accounts for 19 % of the global power consumption and 6 - 8 % of worldwide greenhouse gas (GHG) emissions. /../ Were a global transition to efficient lighting to occur, these emissions could be reduced by half ... See: www.unep.org/rowa/KeyActivities/ClimateChange/tabid/101289

EU:

Directive on Energy End Use Efficiency and Energy Services 2006/32/EC –
9 % improvement in energy efficiency by 2016;
Commission Regulation (EU) No 347/2010.

Energy Price Rise.

A High Profile Front Line Public Service.

Traditionally Reactive and Not Proactive Policy in Maintaining Street Lighting

LACK OF KNOWLEDGE AND EXPERTISE → TECHNICALLY CHALLENGING PROJECTS!

TWO MAIN CHALLENGES

HIGH COSTS

Capex – Core Investment Period

Opex – Ongoing Operation & Maintenance

THE MAIN COSTS OF THE PUBLIC LIGHTING SYSTEM

- 1) Initial Material Costs (Bulbs, Columns / Poles, Electrical Wires, Labor Cost)
- 2) Energy Costs
- 3) Costs of replacing burnt out Bulbs (use of the cherry picker!) & disposal of Bulbs
- 4) Environmental impacts of Lights (carbon dioxide emissions, mercury and heavy metal release in the environment, cost of treating water, land and light pollution, impact on ecosystems and human health)

HOW TO START?

TECHNICAL ANALYSIS

ECONOMICAL ANALYSIS

LEGAL ANALYSIS

→ PROJECT MANAGEMENT

GOOD COORDINATION & COOPERATION IS THE KEY!

INDEPENDENT (!!) TECHNICAL EXPERTISE

ISSUE 1: ANALYSIS OF THE PRESENT STATE

How many lamps do we have?

Where are they?

Current Lamp Technology

Current Regime

Current Consumption etc.

 **ELECTRONIC REGISTER OF LAMPS**

ISSUE 2: IDENTIFICATION AND DEFINITION OF THE FUTURE REGIME AND FUNCTIONALITIES

Modern Lighting Standards

Different Regimes e.g. for Schools, Crossings, Remote Areas

Safety & Health & Heritage Demands etc.

Defining Maintenance Cost

Identification of more Efficient and Appropriate Technologies & Equipment:

e. g. New Lamp Technologies (e.g. LED), Electronic Control Gear

Comparison of Different Lights by Various Parameters & Alternatives

Performance Requirements:

Defining Required Functionalities

How Many Existing Lamps are Appropriate?

Do we Need Additional Lamps?

Future Consumption

Future Regime (Switch Times, Light Control, Dimming & Trimming Regimes)

THE SOLUTION LIES NOT IN TURNING THE LIGHTS OFF,
BUT IN USING THE LIGHT
WHERE NECESSARY,
WHEN NECESSARY,
AND IN APPROPRIATE INTENSITY.

KARIN KOŠAK

INDEPENDENT ECONOMICAL EXPERTISE

ISSUE 1: DEFINING THE POTENTIAL FOR FUTURE SAVINGS

Current Consumption & Costs of Electricity & Including the Maintenance Cost (The older the equipment, the higher the maintenance cost. The Maintenance cost can be much higher than the electricity cost, if the equipment is out-of-date!)

Investment Costs & Maintenance Cost & Future Consumption

→ POTENTIAL FOR FUTURE SAVINGS

WRONG, but frequently used: comparison of the cost of electricity before/after the project!

ISSUE 2: WHY USE STREET LIGHTING AS AN ENERGY SAVING CONTRACT?

PP or PPP?

→ The classic public procurement option is compared with the Energy Saving PPP Model → CBA

ISSUE 3: DEFINING THE CONTRACT DURATION PERIOD

Higher Savings Result in Shorter Contract Period.

ISSUE 4: FUNDING

Private Funds

Combine Private Funds / EU Funds / IFIs for Capex

Upper Limit / Prudential Borrowing

Third Party Revenue Generation Initiatives (Column advertising, WiFi on Columns ...)

INDEPENDENT LEGAL EXPERTISE

ISSUE 1: Risk Assessments - Identification and Allocation of Risks

ISSUE 2: Defining Rights and Obligations of both Parties

ISSUE 3: Defining the Standards

ISSUE 4: Setting up the Model

Defining Payment Mechanism

Control Procedures

ISSUE 5: Public Tender

ISSUE 6: The Contract

STREET LIGHTING POLICY

BEFORE entering into a public tender, all municipalities should have a **STREET LIGHTING POLICY** addressing the **PREVIOUSLY** identified issues
→ Baseline for the Public Tender.



CASE STUDY: STREET LIGHTING IN THE HISTORICAL CITY OF PIRAN, SLOVENIA

OVERVIEW

Number of Residents: 17.000

Number of Street Lights: 3.510

Total Power of Street Lights: 405,1 kW

Energy Consumption: 1.620 MWh

Length of Illuminated Roads: 40 km

Illuminated Area: 10.500 km²

Number of Different Light Types: 36

Number of Lights in Accordance with Legislation: 233

Number of Lights Not in Accordance with Legislation & Replaced: 3.277

Lower Energy Costs: 46 %

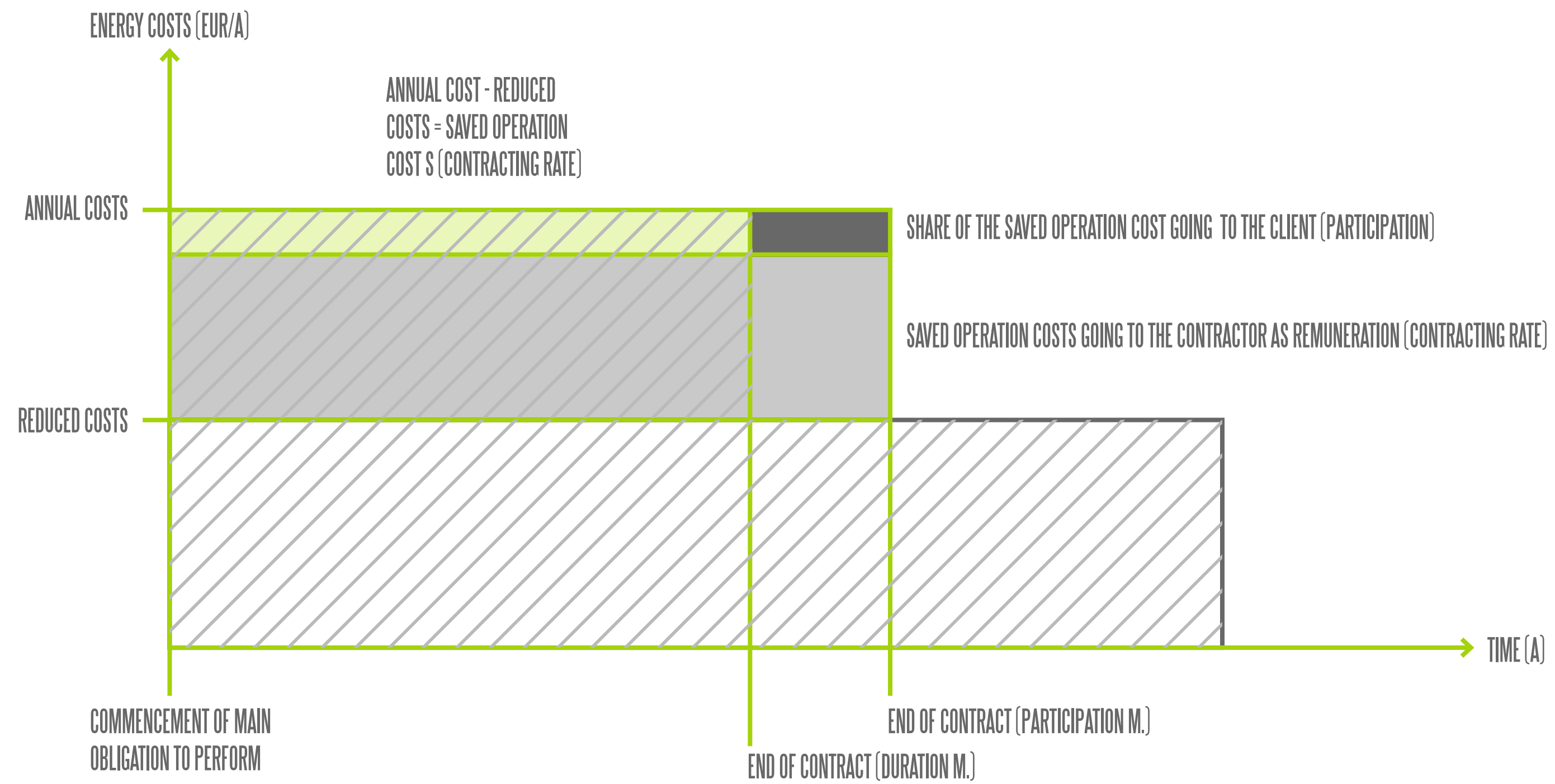
Lower Costs: 90.000 EUR / Year

Service Concession Contract - Contract Period: 20 Years

Core Investment Programme - Major Street Lighting Renewal (Year 1)

Operational Maintenance (Year 1 to 20)

Contract Value: 1,6 mio EUR



THE DURATION AND PARTICIPATION MODEL*

*Source: Guideline for Saving Contracting in Street Lighting, 2006

FUNDING

Investment (Renovation) Financed by Future Savings

LIFE CYCLE COSTS (LCC) OF THE PROJECT MUST NOT EXCEED FUTURE SAVINGS

Always a Challenge: **TO DEFINE FUTURE SAVINGS!**

Private Partner Provides Funding & Investment & Maintenance (Optional, but not used in Piran: Purchase of Electricity)

Public Partner performs Periodic Payments → Calculations & Clauses in the Contract

STREET LIGHTING MAP FOR THE MUNICIPALITY OF PIRAN



THE TECHNOLOGY VS. HERITAGE DEMANDS



- LED
- CFL
- HID



In addition to providing the general functions of public lighting, the **MUNICIPALITY OF PIRAN** also provides decorative public lighting and takes **HISTORICAL DEMANDS** into account.

CASE STUDY: BIRMINGHAM PPP CONTRACT, UK



OVERVIEW

UK Largest Authority Highways PPP

£2.7 Billion, 25 Years, June 2010 start

Covers all roads, footways, lighting, trees, etc.

Also LEDs for Major Tunnels & Traffic Routes

Energy & Carbon Management

CORE INVESTMENT PROGRAMME (YEAR 1 TO 5)

Major Street Lighting Renewal: Remove & replace over 41,000 street lights with LED

OPERATIONAL MAINTENANCE (YEAR 1 TO 25)

On-going operational maintenance:

Asset Management

Inventory updates

Planned Maintenance

Cyclic works

Periodic Electrical Testing

Structural Assessments

Outages & Repairs

Emergency Attendance

Energy & Carbon Management

WHAT DO BIRMINGHAM RESIDENTS THINK?

Overall very positive feedback
Light level perception improved
Safety perception improved
Light colour and appearance improved

85% Brightness Level
ABOUT RIGHT
10% TOO MUCH
3% POOR
2% TOO LITTLE

88% Like Lights
YES
12% NO

78% Safer for Houses
YES
22% NO

91% Safer for Roads
YES
9% NO

IDENTIFICATION OF OTHER

MUNICIPAL PPP ENERGY

SAVING CONTRACTS

CASE STUDY: THE ENERGY RETROFIT PROGRAMME FOR PUBLIC BUILDINGS IN THE CITY OF LJUBLJANA, SLOVENIA

Ljubljana Vision 2025

Environmental Protection Programme of the City of Ljubljana

Sustainable Energy Action Plan

More than 350 Buildings

Total investment 50,7 mio EUR



INVESTMENT PROGRAMME

Total energy savings: 79 GWh

Electricity production: 8 GWh

RES: 4,6 GWh

CO₂ savings: 24.593 t CO₂

TOTAL INVESTMENT

50,7

MIO EUR

2,5 mio EUR Energy management

11,4 mio EUR Building measures

5,1 mio EUR Heating improvements

2,4 mio EUR CHP

0,1 mio EUR RES heat

6,1 mio EUR Efficient lighting

1,7 mio EUR Other measures

9,4 mio EUR PV

12 mio EUR District heating network

COMMON FEATURE OF THE EPC

The Energy Performance Contracting model transfers the performance risk to the Private Partners (ESCos) as they must guarantee the energy savings which will be made over the agreed payback period.

Investment Costs are repaid through the future savings, reflected in lower energy costs, lower maintenance costs, more electronic technologies & equipment / lower labour costs ...



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