

LUCIA

VALAISTUSINVESTOINTIEN ENNAKKOARVIOINTI

Työkalu suunnittelun ja päätöksenteon tueksi

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DESIGN AND IMPLEMENTATION OF THE ECONOMIC ASSESSMENT TOOL

- The purpose of LUCIA economic assessment tool is to help municipalities in indicative assessment of economic and environmental impacts related to investments in public outdoor lighting.
- Notably, the impacts of a transition from sodium or halide based luminaires to smart Light Emitting Diode (LED) luminaires can be studied. The tool helps assessing electricity consumption before and after the investment. Furthermore, the tool also gives information about carbon dioxide (CO₂) emissions.
- Use of the tool is recommended for municipalities where investments in public outdoor lighting are actual.
- The tool provides visual charts and diagrams that help understanding the potential benefits of the investment. The report can be printed out as a paper copy or PDF for dissemination or further use.

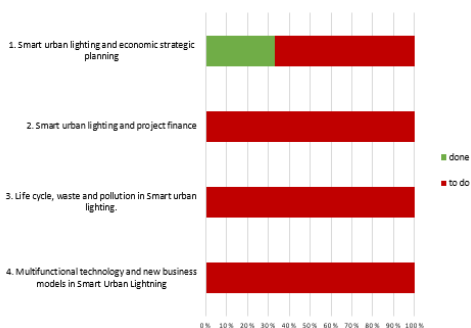
EVALUATION

- EVALUATION BEFORE and AFTER sheets provide an overview of the state-of-the-art situation of the organization in respect to lighting investments. Evaluation sheets address four distinct themes:
 1. Smart urban lighting and economic strategic planning
 2. Smart urban lighting and project finance
 3. Life cycle, waste and pollution in Smart urban lighting.
 4. Multifunctional technology and new business models in Smart Urban Lightning
- Evaluation sheets support quick review on the current situation.
- The aim of the evaluation after sheet is to set targets for public outdoor lighting policy e.g. a project or a program.
- Is based on the information in the LUCIA project factsheets.

Initial project evaluation: self-assessment according to the LUCIA economic factsheets

*please, see the LUCIA EU Interreg Project Economic Aspects of Smart Lighting Report and Factsheets for background information		Situation now
1. Smart urban lighting and economic strategic planning		
1.1 Energy consumption from urban lighting is monitored as a separate item.		yes
1.2 The proposed project's expected (before) / actual (after implementation) energy savings are known.		no
1.3 A calendar for the transition to sustainable energy production and the trend in electricity price is known.		no
2. Smart urban lighting and project finance		
2.1 Either payback time or Net Present Value are calculated for the project		no
2.2 Innovative and green procurement is used.		no
2.3 Alternative finance models are considered as an option (besides own budget).		no
3. Life cycle, waste and pollution in Smart urban lighting		
3.1 Whole life cycle costs are evaluated as part of project planning for urban lighting investments.		no
3.2 Life cycle assessment (LCA, the impact in the environment) is considered (before project) / measured (after)		no
3.3 Avoiding rebound effects and measures to avoid all unnecessary lighting are part of the project goals.		no
4. Multifunctional technology and new business models in Smart Urban Lighting		
4.1 The business model canvas or a similar tool is used to engage stakeholders in smart service development.		no
4.2 A multifunctional lampposts and new revenue models are considered as an option.		no

9 %



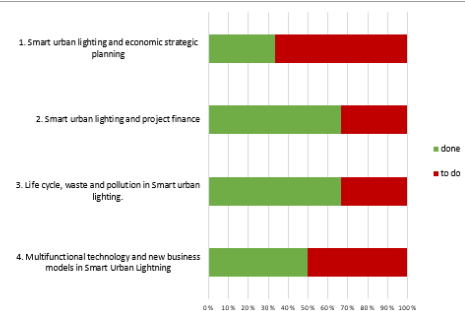
Evaluation before project (max 100 %):



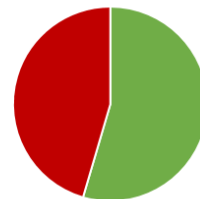
Project evaluation: self-assessment according to the LUCIA economic factsheets

*please, see the LUCIA EU Interreg Project Economic Aspects of Smart Lighting Report and Factsheets for background information		Situation after
1. Smart urban lighting and economic strategic planning		
1.1 Energy consumption from urban lighting is monitored as a separate item.		no
1.2 The proposed project's expected (before) / actual (after implementation) energy savings are known.		yes
1.3 A calendar for the transition to sustainable energy production and the trend in electricity price is known.		no
2. Smart urban lighting and project finance		
2.1 Either payback time or Net Present Value are calculated for the project		no
2.2 Innovative and green procurement is used.		yes
2.3 Alternative finance models are considered as an option (besides own budget).		yes
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4.1 The business model canvas or a similar tool is used to engage stakeholders in smart service development.		no
4.2 A multifunctional lampposts and new revenue models are considered as an option.		yes

55 %



Evaluation after project (max 100 %):




CALCULATION

- Calculation sheet has four different topics that help to contextualize the calculations to your municipality. It is recommendable to use some time in calculating and verifying the values to improve the accuracy of the assessment. Calculation sheet address following themes:
 1. Background information
 2. Current situation on the location
 3. Planned solution on the location
 4. Non-economic benefits
- User may start using the tool with incomplete data and make updates when better data is available.
- The tool provides background data for the calculations.
- The charts update dynamically based on the given data.

CALCULATION TOOL




Inputs

- Background
 - Project
 - Country selection (drop-down)
- Current solution
 - Main lamp type (drop-down)
 - Number of lamps
 - Current costs
- Planned solution
 - Number of lamps
 - Main lamp type (drop-down)
 - investment costs & subsidies,
 - Duration



Calculation algorithms

Background datasets

- Benchmark solutions
- Economic profitability background values
- Country related data (price of electricity, electricity production and CO₂eqv emission)



Reporting & result visualisation

- Total installed capacity
- Profitability (charts)
 - Electricity cost saving
 - Maintenance cost saving
 - Annual electricity consumption
 - Reduction electricity consumption
- Comparison to current situation
- Other than economical benefits, CO₂eqv reduction (tons/year) & social well being (security, quality of urban environment & art, smart solutions, impacts on nature)

Background information

NOTE: fill red if known

Project name	Pilot Side Altona			
Country	Finland			
Population in the area	5 000	inhab.		
How many hours per year do you operate your lighting?	3 650 hours / year			
Electricity costs €/100 kWh	Default by country 15,8	if known:		
Electricity energy production if known, %	Conventional thermal 60	Renewable 10	Nuclear 30	total, % 100
Electricity energy production by country average, %	39	28	33	

Current situation in the location

Street lightning	Lamp type	Amount of lamps (pc)	W / lamp if known	%
LT1	low-pressure sodium ("LPS")	10		6 %
LT2	metal halide ("HID & HQL")	30		18 %
LT3	metal halide ("HID & HQL")	30		18 %
LT4	light emitting diodes ("LEDs")	100	10	59 %
total		170		100 %
Current electricity consumption calculated	35 929 kWh / year			
Current electricity consumption if known	kWh / year			
Current emissions	733 tCO ₂ eq / year			
Costs electricity, calculated	5 677 € / year			
Costs electricity, if known	€ / year			
Costs, maintenance	200 € / year			
Operating costs, total	5 877 € / year			

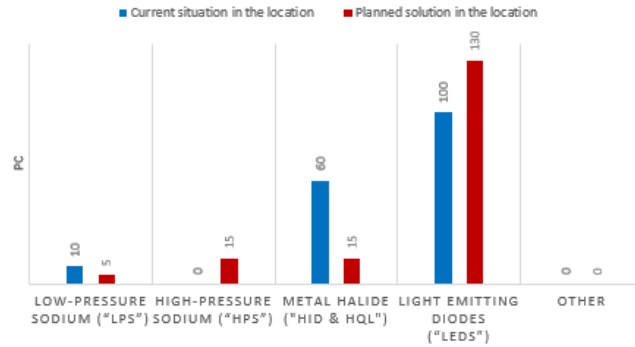
Planned solution in the location

Street lightning	Lamp type	Amount of lamps (pc)	W / lamp if known	%
LT1	low-pressure sodium ("LPS")	5		3,0 %
LT2	high-pressure sodium ("HPS")	15		9,1 %
LT3	metal halide ("HID & HQL")	15		9,1 %
LT4	light emitting diodes ("LEDs")	130	30	78,8 %
total		165		100,0 %
Future electricity consumption calculated	30 375 kWh / year			
Future electricity consumption if known	kWh / year			
Future emissions	620 tCO ₂ eq / year			
Investment costs	200 €			
Costs electricity, calculated	4 799 € / year			
Costs electricity, if known	0 € / year			
Costs, maintenance	100 € / year			
Costs (20 yrs), total	4 910 € / year			

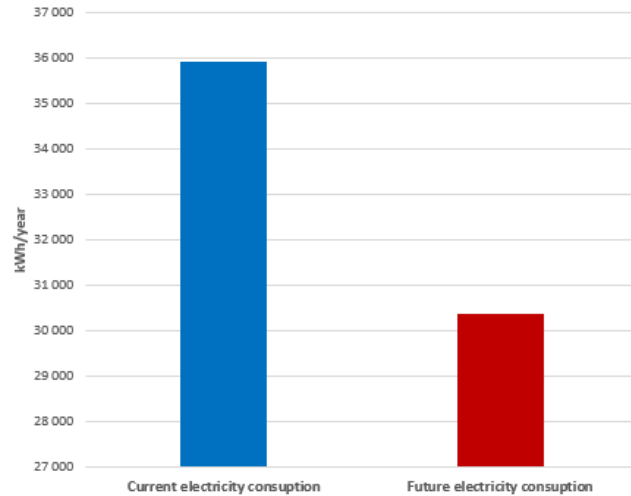
Non-economic benefits

	select answer
Does the proposed solution improve safety compare to the current situation?	no
Is there any art/urban design feature involved?	no
Does the solution improve the situation on light pollution?	yes
Does the solution include any smart features (navigation, commerce, charging)?	yes
Are there any positive ecological impacts on animal or plant population (bats, insects, etc.)	yes

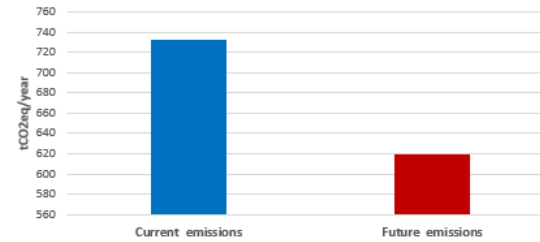
STREET LIGHTING, LAMP TYPES



ELECTRICITY CONSUMPTION SAVINGS



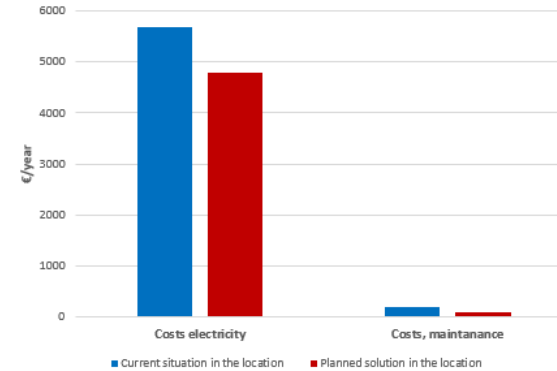
CARBON EMISSION REDUCTION



CO2eq emission saving: 113 tCO2eq / year

CO2eq emissionsaving per inhab.: 0,023 tCO2eq / year

COSTS SAVINGS



Operating costs saving: 967 € / year
 Operating costs saving per inhab.: 0 € / year
 Investment: 11 € / year (20 yrs)



FCG

Hyvän elämän tekijät