

Calculation and reporting of CO2 emissions and savings attributable to lighting

Municipality	Slovenska Bistrica
Country	Slovenia
Population	22,893

Electricity Data

Municipality	Slovenska Bistrica
Country	Slovenia
Population	22,893

Office lighting

Existing situation

No of lamps (Estimation)	Lamps		Ballast		Total	Service time	Service time	Energy consumption
	Type of lamps	Wattage (kW)	Type of ballast	Power loss (kW)	Power (kW)	(hours/day)	(h/a)	(kWh)
					0.00		0	0
					0.00		0	0
					0.00		0	0
					0.00		0	0
					0.00		0	0
		0		0	0		0	0.00

Post investment

No of lamps (Estimation)	Lamps		Ballast		Total	Service time	Service time	Energy consumption
	Type of lamps	Wattage (kW)	Type of ballast	Power loss (kW)	Power (kW)	(hours/day)	(h/a)	(kWh)
					0.00		0	0
					0.00		0	0
					0.00		0	0
					0.00		0	0
					0.00		0	0
		0		0	0		0	0.00

Voltage (Volt)	
Power factor (cosφ)	

Electricity Data

Street lighting

Total length of lighting network (km)

Existing situation

No of lamps	Lamps		Ballast		Total	Service time (hours/day)	Service time(*) (h)	Energy consumption (kWh)	cosφ	Total consumption (KWh)	Energy
	Type of lamps	Wattage (kW)	Type of ballast	Power loss (kW)	Power (kW)						
49	FLUOR	0.36	KVG	0.007	17.98		4000	71932.00			
1014	HME	0.125	KVG	0.015	141.96		4000	567840.00			
106	HME	0.25	KVG	0.031	29.79		4000	119144.00			
1	HME	0.4	KVG	0.04	0.44		4000	1760.00			
307	HST	0.07	KVG	0.012	25.17		4000	100696.00			
23	HST	0.15	KVG	0.02	3.91		4000	15640.00			
177	HST	0.25	KVG	0.03	49.56		4000	198240.00			
6	HST	0.4	KVG	0.04	2.64		4000	10560.00			
17	HST	0.4	KVG	0.04	7.48		4000	29920.00			
					0.00		4000	0.00			
1700					278.93			1,115,732.00			

(*) provided

0.9 1,239,702

Post investment

No of lamps	Lamps		Ballast		Total	Service time (*) (h)	Energy consumption (kWh)	cosφ	Total consumption (KWh)	Energy	
	Type of lamps	Wattage (kW)	Type of ballast	Power loss (kW)	Power (kW)						
24	HST	0.08		INCLUDED	1.92		4000	7680.00			
1014	HST	0.08		INCLUDED	81.12		4000	324480.00			
106	HST	0.11		INCLUDED	11.66		4000	46640.00			
1	HST	0.15		INCLUDED	0.15		4000	600.00			
307	HST	0.08		INCLUDED	24.56		4000	98240.00			
23	HST	0.11		INCLUDED	2.53		4000	10120.00			
177	HST	0.17		INCLUDED	30.09		4000	120360.00			
6	HST	0.28		INCLUDED	1.68		4000	6720.00			
17	HST	0.17		INCLUDED	2.89		4000	11560.00			
					0.00		4000	0.00			
1675					156.60			626,400.00			

0.9 696,000

Voltage in transmission lines (kVolt):	20
Low voltage (kVolt)	0.4
Distribution losses	0.148
Distance to the nearest medium voltage distribution station (km):	5

Total Actual Energy Demand

Wires' resistance (Ω /km)	0.23
Wires' resistance (Ω)	NO DATA
Consumption (%)	14.80%
Length of transmission wires (km)	0.00

OFFICE LIGHTING

Total energy demand in buildings for lighting (kwh)	NO DATA
Energy production required (kWh)	-

STREET LIGHTING

Total energy demand for street lighting (kwh)	1,239,702.22
Energy production required (kWh)	1,423,178.15

TOTAL

TOTAL energy DEMAND (KWh)	1,423,178.15
TOTAL TRANSMISSION LOSSES (KWh)	183,475.93

Total Post-investment Energy Demand

Wires' resistance (Ω /km)	0.23
Wires' resistance (Ω)	NO DATA
Consumption (%)	14.80%
Length of transmission wires (km)	0.00

OFFICE LIGHTING

Total energy demand in buildings for lighting (kwh)	NO DATA
Energy production required (kWh)	-

STREET LIGHTING

Total energy demand for street lighting (kwh)	696,000.00
Energy production required (kWh)	799,008.00

TOTAL

TOTAL energy DEMAND (KWh)	799,008.00
TOTAL TRANSMISSION LOSSES (KWh)	103,008.00

Actual CO2 emissions

Office lighting

CO2 emissions

Type of fuel	Fuel Contribution *	Total electric energy demand (Kwh)	CO2 emissions per electric kWh produced (kg/kwh) **	CO2 emissions per fuel (t)
Coal/Lignite	34.00%	-	0.959	-
Oil	0.30%	-	0.8186	-
Natural gas	2.30%	-	0.4475	-
Nuclear	35.70%	-	0.004	-
RES	27.60%	-	0	-
Other	0.00%	-	0	-
	99.90%	0.00		

CO2 emissions (t/year)

0.00

Street lighting

CO2 emissions

Type of fuel	Fuel Contribution *	Total electric energy demand (Kwh)	CO2 emissions per electric kWh produced (kg/kwh) **	CO2 emissions per fuel (t)
Coal/Lignite	34.00%	483,880.57	0.959	464.04
Oil	0.30%	4,269.53	0.8186	3.50
Natural gas	2.30%	32,733.10	0.4475	14.65
Nuclear	35.70%	508,074.60	0.004	2.03
RES	27.60%	392,797.17	0	0.00
Other	0.00%	0.00	0	0.00
	99.90%			

CO2 emissions (t/year)

484.22

TOTAL CO2 emissions from lighting

CO2 emissions (t/year)

484.22

* Source: Eurostat (2004)

** Source: Fuel and Energy

Production Emission Factors, AEA
Technology

Post-investment CO2 emissions

Office lighting

CO2 emissions

Type of fuel	Fuel Contribution *	Total electric energy demand (Kwh)	CO2 emissions per electric kWh produced (kg/kwh) **	CO2 emissions per fuel (t)
Coal/Lignite	34.00%	-	0.959	-
Oil	0.30%	-	0.8186	-
Natural gas	2.30%	-	0.4475	-
Nuclear	35.70%	-	0.004	-
RES	27.60%	-	0	-
Other	0.00%	-	0	-
	99.90%	0.00		

CO2 emissions (t/year)

0.00

Street lighting

CO2 emissions

Type of fuel	Fuel Contribution *	Total electric energy demand (Kwh)	CO2 emissions per electric kWh produced (kg/kwh) **	CO2 emissions per fuel (t)
Coal/Lignite	34.00%	271,662.72	0.959	260.52
Oil	0.30%	2,397.02	0.8186	1.96
Natural gas	2.30%	18,377.18	0.4475	8.22
Nuclear	35.70%	285,245.86	0.004	1.14
RES	27.60%	220,526.21	0	0.00
Other	0.00%	0.00	0	0.00
	99.90%			

CO2 emissions (t/year)

271.85

TOTAL CO2 emissions from lighting

CO2 emissions (t/year)

271.85

CO2 reduction (t/y)

212.37

43.9%

Electricity savings (kWh/y)

624,170

Percentage of lamps changed:

71.3%

* Source: Eurostat (2004)

** Source: Fuel and Energy

Production Emission Factors, AEA
Technology