



REPUBLIC OF SLOVENIA  
MINISTRY OF THE ENVIRONMENT AND SPATIAL PLANNING

# Light Pollution Workshop 2020

## Slovenian experience

WebEX videoconference

May 14<sup>th</sup> 2020

M.Sc. Matjaz Ferjancic  
[matjaz.ferjancic@gov.si](mailto:matjaz.ferjancic@gov.si)  
Tel.: +386 1 478 7448



## Decree on limit values due to light pollution of environment

Issued in March 2007, amended in November 2007, July 2010 and May 2013

<http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED4520>

- Prohibition of lamps' luminous flux above the horizontal level
- Annual electricity consumption for lighting of municipal roads and public areas → target value for 44.5 kWh per municipality resident
- Lamps' electric power for illumination of uncovered surfaces next to production facilities, office buildings, institutions → limit value 0,06... 0,09 W/m<sup>2</sup> during operating hours 0,015 W/m<sup>2</sup> outside operating hours
- Lamps' electric power for advertising boards → limit value 17 W/m<sup>2</sup> (board > 18,5 m<sup>2</sup>) ... 80 W/m<sup>2</sup> (board < 2 m<sup>2</sup>); external luminaires shall be switched off from 24:00 to 5:00 for boards > 20 m<sup>2</sup>
- Average luminance of facade surfaces and cultural monuments → limit value 1 cd/m<sup>2</sup>
- Residence windows' illumination → limit value 0,2... 25 lx (based on window distance from light source; night hour)
- Transitional provisions for existing lamps until December 2016 (adaption depends on light source)
- ...



## Decree on limit values due to light pollution of environment

- ...
- The operator of illumination (> 10 kW total lamps' electric power) must have the Light plan
- Light plan content:
  - number and nominal electric power of lamps
  - exact location of lamps
  - annual energy consumption for lighting of municipal roads and public areas
  - length of illuminated roads, area of illuminated surfaces of facilities, parking lots, facades...
  - information about lamps with light flux above the horizontal level
- Light plan shall be updated:
  - every 5 years
  - when total lamps' electric power increase > 15 %
  - > 30 % of lamps are replaced
- Light plan shall be public available
- Light pollution monitoring is not prescribed, residence windows' illumination measurement only on the inspection's request



## Light plans – data analysis

Surveillance year: 2009 – 2018

- Average annual electricity consumption for lighting of municipal roads and public areas in the Republic of Slovenia and total annual energy consumption

<u>2009</u>	<u>2018</u>	target value
57,3 kW/m.p.	42,9 kW/m.p.	44,5 kW per municipality resident
59,4 MWh	63,3 MWh	

- No. of municipalities exceeding annual electricity consumption 44,5 kW/m.p.

<u>2009</u>	<u>2018</u>
34	26

- No. of lamps, total connected electric power and lamps' average electric power

<u>2009</u>	<u>2018</u>
118.117	219.347
19.249 kW	22.297 kW
163 W	102 W



## Light plans – data analysis

Surveillance year: 2009 – 2018

- No. of unsuitable lamps and no. of municipalities with the unsuitable lamps (light flux above the horizontal level)

2009

85.174

77

2018

33.304

75

- Illumination of roads / civil engineering facilities (production facilities, office buildings, institutions ...) / facade surfaces and cultural monuments

2009

2.818 km

5.512.000 m<sup>2</sup>

51.000 m<sup>2</sup>

2018

4.998 km

3.861.000 m<sup>2</sup>

78.000 m<sup>2</sup>



## Light plans – data analysis

Surveillance year 2018

Additional data, submitted on the request of the ministry  
(not part of the Decree provisions or prescribed content of the Light plan)

- Reduction of lamps power or switch off part of the illumination at late night hours (≈ 23:00 to 5:00): 70 municipalities
- Use of motion sensors to turn the lamps on: 2 municipalities
- Use of LED lamps / percentage of LED lamps for illumination:
  - 126 municipalities
  - ≈ 31 % of all lamps (i.e. ≈ 23 % of nominal electric power)

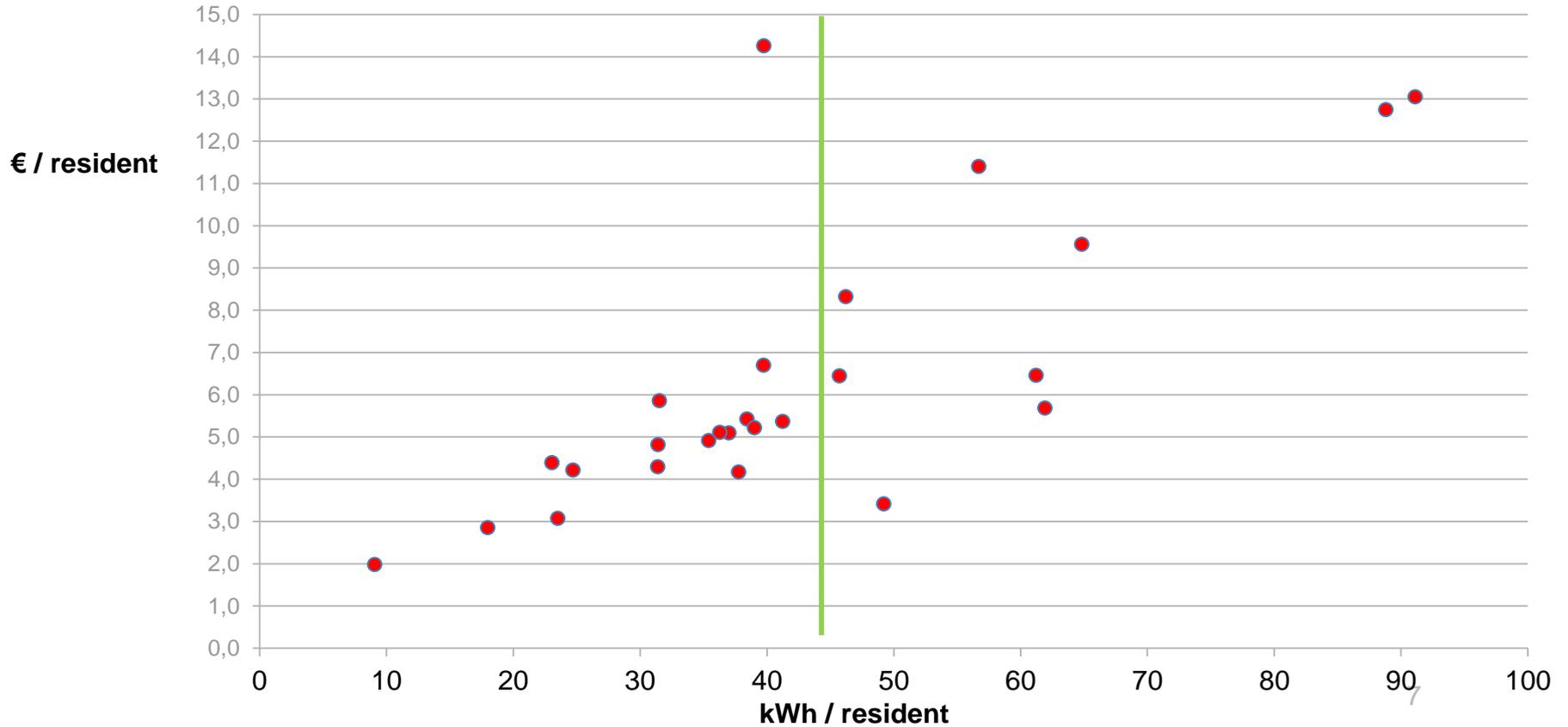
*Data as reported by municipalities in 2009 (≈50% of Slovenian population) and in 2018 (≈75% of Slovenian population). Total no. of municipalities 212. All data are for informational purpose only.*



## Light plans – data analysis

Surveillance year 2018

### Annual costs of illumination





## New Decree is under preparation

### Issues to be addressed

- New developments and technologies of the lamps → reduced electric power consumption
  - target value of 44.5 kWh per municipality resident is obsolete and shall be updated
- New developments and technologies of the lamps → lower nominal electric power enables increased illumination
  - power limit value [ $\text{W}/\text{m}^2$ ] shall be replaced with illumination limit value [lx]
- Limitation of the lamps' color temperature?
- Late night reducing lamps' electric power or switching off the illumination on the area with low traffic frequency
- Residence windows' illumination measurement → accreditation requirements shall be simplified for authorized bodies to obtain measurement authorization



## New Decree is under preparation

The prevention of light pollution shall be:

- self-evident
- user friendly
- low-budget
- ...

**If you don't need it, don't use it!**

**Any suggestions?**