Draft of the Statutory Order of the Czech Government

acc. to § 55 of the Act 86/2002 Sb.

(Clean Air Act, further just **Act,** see `www.astro.cz/darksky`)

third version, September 2002

The original proposal has been derived from the Lombardy law LR 17/2000 (see `cielobuio.org/arc-lrl17a.php` for more info); this in turn is based on the experience with the older laws of another Italian regions (and consequently on the extensive Italian practice in preventing the light pollution). Compared to the Lombardy law, the second version of the draft of the statutory order omitted or made less strict many measures, also the diction is made simpler. A simple definition of "one lighting point" has been introduced, as a sphere with a radius of 2 m around the light source. In September 2002 the proposal has been supplemented by explicit upper limits for the amount of light, as they are contained in the laws of Italian regions Lazio and Marche (and in the deliberation of the Council of Lombardy). The present base information source is the brochure on the application of the Lombardy law 17/00. Limits valid also for billboards with internal lighting are added moreover.

§ 1 Rules for outdoor lighting

(1) All the new installations of illuminating systems in the outdoor air, as well as the adaptations of the existing systems, have to satisfy the rules for the prevention of light pollution according to this paragraph. This applies as well to changes, which are in the phase of planning or contract. Those, which are in the phase of execution already, have to satisfy the requirements of this paragraph before the end of the year 2003.

(2) Only those illumination systems which conform to the following rules, are considered as producing no light pollution and minimising also another pollution of the air:

a. they are composed of luminaires which do not shine into the upper half-space[1]

[1] As a upper half-space, usually the directions over the horizontal plane going through the luminaire are considered. In case of a sloped terrain, it can be understood as the directions over the plane parallel with the terrain or over a plane with a slope lying between these two extrema. As a luminaire which do not shine into such directions, even each such can be considered, whose specific luminous intensity in these directions, after being rounded to a whole number, is just 0 cd

b. they use the best available technology,[2]
c. they are realized in such a way that the luminance of the illuminated surfaces does not exceed the value demanded by the safety standards, if they exist,[3] or the value 1 cd/m^2, in the absence of safety standards,
d. and they are equipped by the devices capable of reducing the amount of emitted light by at least thirty per cent compared to the full output, after 12 p.m. Such reduction of the amount of light is applied when the conditions of the use of the illuminated surface are such, that the safety is not endangered.

(3) Requirements of the Article 2 need not be adhered to for light sources (bulbs) with a luminous flux not exceeding 1500 lumen, if they are at most three in one lighting point[4] or if their cumulative luminous flux into the upper half-space is below 2250 lm for one lighting point, and for such temporarily[5] used sources, which are not in use after 10 p.m. in the season of the daylight saving time validity and after 8 p.m. outside the season of the daylight saving time validity.

(4) Illumination of any information boards[6] has to be realized just by sending light downwards or by light sources placed inside the board. The maximum allowed luminous intensity is 100 cd for boards with an area of 1 m^2 and lower, the maximum allowed luminance is 1 cd/m^2 for board with an area of 1000 m^2 and larger. For boards with an area S between one and one thousand square metres, their mean luminance L has not to be over:

$$L = \frac{100\,\mathrm{cd/m^2}}{(S/1\,\mathrm{m^2})^{2/3}}$$

per thousand lumen of the luminous flux emitted by the light source (bulb) inside the luminaire. Such a luminaire is called “fully shielded”.

[2] as defined in the § 2 Art. 1 of the Act

[3] as such standards, prEN 132 01-1 to -3 (or ČSN 36 0400, 0410 and 0411 in the meantime) can be considered; for the systems whose luminous flux cannot be regulated continuously it is allowed that the condition of not exceeding the luminances demanded by such standards is satisfied only at the end of their planned life

[4] for the purpose of this Order, by lighting point the area with a radius of two metres around the light source is meant

[5] maximum three months

[6] any surface serving for advertisement is considered to be an information board

– i.e., their luminous intensity I over:[7]

$$I = L/S = 100\,\mathrm{cd} \cdot \frac{S}{1\,\mathrm{m}^2}^{1/3}$$

(5) Companies which produce, import or supply outdoor fixtures have to include (among the technical characteristics of the offered luminaires) a statement on their conformance with this Order by writing on the product: "optics producing no light pollution, according to the laws of the Czech Republic" and (in the package with the fixture) a text explaining the correct use of the fixture.

(6) It is explicitly forbidden to use, for merely promotion purposes, any upward aimed, movable or fixed, bundles of rays of any type.

(7) For the illumination of edifices or monuments, systems shining downwards have to be preferred. Only when it is not technically possible, in case of objects of particular and proven architectonic and historic value, another type of lighting can be used. In such a case, the margin of the beam has to remain at least one metre below the upper end of the surface to be illuminated and within the perimeter of that building or monument. The illuminating system has to be equipped with a suitable device to limit the dispersion of light outside the surface to be illuminated and it has to be switched off or dimmed at least by one half not later then at 1 a.m. during the validity of the daylight saving time or 0 a.m. outside the validity of the daylight saving time. The maximum allowed mean luminance of the lit surface is $1\,\mathrm{cd/m^2}$.

§ 2 Areas of a special protection

(1) Considering that the time span for lowering the light pollution by a mere reconstruction of the lighting systems acc. to § 1 is given by the lifetime of such systems amounting to decades, there are declared, in the emergency cases, areas with terms for improving the current state (further just **protected areas**).

[7] the rounded upper limits are therefore

$\frac{S}{\mathrm{m}^2}$	$\frac{L}{\mathrm{cd/m}^2}$	$\frac{I}{\mathrm{cd}}$
3	48	145
10	21	215
30	10	310
100	4	460
300	2	660

(2) Protected areas are declared in particular around astronomical observatories. Protected areas declared by the effective date of this Order are given in the Appendix.

(3) It is upon the subject, for whose interest the protected area has been declared by the Government, to announce this fact to the concerned municipalities and operators of light sources.

(4) Protected area can be declared on their territory by the the municipal authorities, within their delegated competences.

§ 3 Further dispositions applying to the protected areas

(1) All luminaires which do not satisfy the rules of the § 1 have to be replaced or adapted in such a way, that they satisfy the rules of the § 1, within four years from the declaration of the protected area.

(2) An exception is granted to existing luminaires, whose replacement is not planned within four years, and whose adaptation in such a way, that they would not emit light into the upper half-space, is not well achievable. Instead of their replacement by fully shielded luminaires they can be equipped by suitable shields directing their luminous flux toward the earth and limiting their specific luminous intensity into the upper half-space up to at most 15 cd per thousand lumen. Another solution can be negotiated between the municipality and the subject, for whose interest the protected area has been declared.

(3) All kinds of the information boards, which have no specific and indispensable nighttime purpose, have to be non-illuminated after 11 p.m. in the season of the daylight saving time validity and after 10 p.m. outside the season of the daylight saving time validity.

(4) Persons, including the municipalities which have not complied with the criteria demanded by this Order in the protected areas, are suspended of the benefit of a special electricity tariff for public lighting, until they bring their lighting systems in accord with this Order. The resolution about that is issued by the regional authority, within its delegated competences, after a preceding inspection based on the announcement of the subject, for whose interest the protected area has been declared. The regional authority submits the information on such a resolution to

the competent supplier of electricity with the demand to make a new agreement on the supply with the concerned person.

Appendix: List of the protected areas acc. to § 2 Art. 2

(1) Subjects, where the protected area is declared with a radius of 10 km around them:

- Observatory of the Astronomical Institute of the Academy of Sciences of Czech Republic, Ondřejov
- Observatory of the Obs. and Planetarium in České Budějovice, Kleť

(2) Subjects, where the protected area is declared with a radius of 1 km around them:

- Observatories of the N. Copernicus Obs. and Planetarium in Brno and the Astronomical Institute of the Masaryk University, Brno
- Štefánik Observatory, Prague
- Observatory, Úpice
- Observatory, Valašské Meziříčí
- Johann Palisa Observatory and Planetarium, Ostrava
- Observatory and Planetarium, Hradec Králové
- Observatory, Vsetín
- Observatory, Rokycany
- Observatory, Vlašim

(3) The above listed protected areas will serve as model ones for the implementation of this Order. Their enlargement and a series of new ones, esp. around another observatories accessible to public, should be declared later.

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