

**Explanatory Report**  
concerning the  
**Proposal of the changes of the Act 86/2002 Sb.**  
**(of the Czech Clean Air Act), see**  
<http://www.astro.cz/darksky>)  
to ensure that its goal to lower  
the light pollution will be realized

*(The explanatory report is an introduction to the version of the text of the proposal which is commented in detail, see e.g. [http://svetlo.astro.cz/darksky/cz\\_law/lp\\_en\\_ex.pdf](http://svetlo.astro.cz/darksky/cz_law/lp_en_ex.pdf), the report alone gives no arguments concerning the details of the proposal.)*

## Summary

The amount of light added to the night atmosphere rises approximately twice each ten years. In most cases such light is poorly directed, with a series of adverse effects on health, nature, safety and culture. The only, reliable way to stop the rapid growth of this type of pollution and to lower the amount of light going into inappropriate directions are, as the experience from a lot of places all over the world shows, **explicit instructions contained directly in the law. A minimum set of them is contained in the submitted proposal of the change of the law.**

The light pollution is, in many respects, similar to chemical one, but it can be reduced more easily and quickly. A more pleasant, safer and easier to survey night environment will be gained this way, together with significant financial savings. By changing its Clean Air Act the Czech Republic will become, as a nation, a “number one” in the world.

## Night environment

Protection of the atmosphere against the light pollution means, in fact, the protection of the night environment, an effort to conserve, or rather to regain that property, which is the key one for it: namely the natural darkness.

Alternation of the day and night, of the light and dark, is the basic rhythm of the environment. A rhythm so axiomatic, that, formerly, nobody suspected that it is ever more endangered. All the living creatures, which don't live in eternally dark depths, are accustomed to it and do need this rhythm. Darkness is no less important than light.

The darkness is never a total one on the earth surface, in fact the human vision, as it gets adapted to the twilight, sees even in a deep moonless night outdoors (not the details, but e.g. the path ahead), the more so during bright summer nights or by the moon.

The natural darkness is waning everywhere rapidly, the night illumination is doubling on average each ten years. It is an example of completely unsustainable exponential growth.

In many places the artificial illumination of the terrain and another objects is needed in some extent – stronger in the evening, fainter or none at all late at night. **It is easily possible, by technical measures, to implement such illumination, where almost no light from the lamps goes out of the surfaces to be illuminated (and none at all up to the atmosphere) and where the amount of light is just such which is needed at the moment. The disturbance of the surrounding night environment can be minimised this way whereas the quality of illumination of the target spaces enhanced tremendously.**

## The Clean Air Act

The Act included the protection of the atmosphere against the artificially added light in its first version already (particularly against light going to evidently undesirable directions), nevertheless the issuance of the instructions how the outdoor lighting should be made has been delegated to the government.

It appeared that such a way does not lead to the protection of the night environment. The same experience has been made in all places in the world where the goal to reduce the light pollution has been just declared within the law and further activities have been left to the executive. It seems that the advocates of that current lighting practice, which expands quickly and takes mostly no regards, are able to influence the administration more effectively than they can influence the legislators.

On the contrary, where the basic rules for outdoor lighting are contained in the law, the growth of light pollution has been at least effectively slowed down. And if the rules had been operative, the growth of light pollution has been stopped and turned into reduction, just like in the case of many further ways of polluting the atmosphere.

Even in Czechia we have therefore to include at least minimum rules directly into the law. Fortunately, we have where to learn from. In those places in the world where they have such effective rules, everybody is very content with their consequences, including the producers of lighting technology at last – the rules lead to innovations and the firms assert themselves better at the world market. At least some customers chose quality lighting even without being forced to do so by the law, there are examples like that in the Czech republic, just there are really rare up to now.

## **The change of the law**

consists in introduction of general framework and rules for future activities in outdoor lighting and in a small step towards an accelerated protection of the close surroundings of the most sensitive localities.

## **The rules valid everywhere**

The main adaptation of the law is amending a separate chapter devoted to the protection of the night environment. All the necessary rules are contained there. Most of them concern outdoor lighting on the whole Czech territory, with one exception just the future lighting, i.e. newly installed or a reconstructed one. **It does not cost any more to use just luminaires and systems of them which minimise the**

**light pollution, instead of those, which are used most commonly nowadays in Czechia.** The practice of communes which chose such technologies on their own decision reflects it – they did so to save money. The luminaires which direct the light much better need not be more expensive (they are produced in all price categories, even in Czechia under the leadership of those Italian producers, which got ahead of the world thanks to the legislation of Italian regions). Control systems which govern the amount of light according to the real need are an “extra” investment of course, but such a favourable one, that implementing a control system is a way of financing the whole reconstruction of the lighting system commercially (it is a case of all main roads in Brno).

The only exception, where a whole-area intervention to the current lighting is demanded, is a ban on using reflectors pointed just into the sky on purpose (of course, with exception of their use for the needs of aviation). Their use can be stopped with no cost, from day to day. The pollution produced by them is so extreme that a ban is quite appropriate. It can hardly represent any detriment, it is rather an end to a baseless advantage of some businessmen against another ones; the businessmen know well it is a large pollution and annoyance of thousands of people.

### **Amelioration at the most vulnerable localities**

In the final part of the new chapter an intervention to the existing illumination is required. However, the requirement is limited to the close surroundings of those localities which are damaged by poor luminaires in a particular way and where a consensus exists they surely deserve protection. Directly in the proposal, two types of such localities are named: those, where the highest degree of wildlife protection is in force, and those, from where people observe the night sky and the terrestrial lights make it very difficult to impossible.

The main requirement for their close surroundings is very modest: to terminate the strong shine toward those localities. The time span for that is one year for the closest surroundings, for the broader ones it is four years. No large costs will implied, the intervention is not much more demanding than a common maintenance of the luminaires. And the auxiliary requirement is even simpler: to switch off those lights in their closest surroundings, which are not essential. This requirement can be fulfilled almost immediately with almost no cost at all (by resetting the contact making clock).

## **Why is the light pollution reduction urgent**

Apart from introducing concrete rules for night illumination the changes aim at inserting the light which is artificially added to night environment simply among the “classic” polluting stuffs. At clarifying that it is really a pollution of the atmosphere. And at enabling to use standard mechanisms which the state has available to protect the atmosphere. In the same time the obligation to formulate the rules how to protect the night environment is taken off the government. The communes are given a full possibility to protect it more effectively and quickly than just using the minimum rules given in the new chapter of the law.

A quick improvement of the night environment is very desirable indeed.

### **Darkness is necessary for health**

Millions of Czech inhabitants sleep worse because of lamps which shine into their windows superfluously, often the whole night in the full strength – even if many of them don’t realize it. Moreover, there exists a serious suspicion that light-at-night has another grave consequences, particularly an increased number of cancers.

### **Light kills animals**

Lamps which are visible from a distance hurt night-active animals, particularly insects and migrating birds (especially small, non-gliding birds migrate at night). Due to such lamps, populations of some insect species are diminished to a fraction of the numbers which would exist without interference by poor lighting, with vast consequences to the food chains and whole ecosystems.

### **Glare is dangerous**

Careless illumination disturbs also people moving outdoors, if it shines into their eyes instead of just to the road. Glaring lights (over used-car-shops, lonely railway stations, or pointed up to the buildings etc.) are often downright dangerous for the drivers which can fail to notice a pedestrian or a cyclist because of them.

### **We miss the starry heavens**

And of course, among the glaring lamps people will hardly notice the natural lights, namely the stars. Children do not realize that planets are not just the images

in magazines or at Internet, but that there are the brightest points in the sky. Most people have no common access to at least a bit interesting starry heavens. A breathtaking glory of the truly natural sky is experienced by a just tiny fraction of the growing generation. It has probably deeper consequences than we realize. Today politicians, at least the older ones, could see a beautiful night sky on at least a quarter of the evenings when they were young... In the third millennium, even if one is far from settlements and lamps, the air high above is so much illuminated by poor luminaires being tens of kilometres away, that there is no sky akin to the natural one anywhere in the Czech republic any more.

## **Light pollution can be reduced more easily than a chemical one**

The detrimental consequences of nighttime lighting are no “tribute to the progress”, just a tribute to the negligence. Light pollution has a tremendous advantage over chemical pollution that it can be lowered quickly and with large savings. And that we get much more pleasant towns or village centres where you will see your way better. Just the crucial impulse to do that has to be issued. Such an impulse, it is the uncompromising requirements of the law.

**Czech republic became world-renown** already by including light as a polluting factor into an important law. Now it has an opportunity to establish the basic rules which will become precedent for another countries and for the EU, and to get famous even in the practical reduction of this “new type of pollution” (when in the protection of the ozone layer and of the Earth climate it has been, say, “in the field”). The Czech industry will benefit, but mainly the citizens!

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