



Hambrücken, 20.09.2023

**Open Letter to the European Commission asking for an exception of certain lighting products to guarantee animal welfare and ex-situ species conservation in Europe**

Dear Madam President Ursula von der Leyen,  
dear Mister Commissioner Janusz Wojciechowski,  
dear Madam Commissioner Stella Kyriakides,  
dear Madam Commissioner Kadri Simson,  
dear Mister Commissioner Virginijus Sinkevičius,

the organizations from the fields of animal welfare, species conservation, animal husbandry and veterinary medicine signing this letter are addressing you with an urgent request.

In the past few years, the European Commission has issued several legal regulations that are intended not only to govern the energy efficiency of various products and illuminants in the future, but also to limit hazardous substances such as mercury in illuminants to the bare minimum (RoHS initiative). Exceptions to this are only permitted within very narrow limits in some cases, for example within the scope of certain technical specifications. All other products are already banned or will be soon.

The aim of the legislative procedures is undisputedly sensible and worthy of support. However, these legal requirements now mean that certain light sources will be banned for animal husbandry in the future. Previously, there were exceptions in the EU regulation for "*special purpose products*" (e.g., pet care, EU 1194/2012, Article 2, 4(a)(i)), but these are no longer listed in the new regulations. This not only has serious implications for the husbandry and welfare of amphibians, reptiles, birds, and small mammals under human care, but also threatens biodiversity conservation projects in zoological and private facilities (*ex situ* species conservation) throughout the European Union.

In the attached summary, we explain to you, based on scientific information, why not only light and heat emitting lamps are essential for animal welfare, but also why mercury cannot be dispensed within certain types of lamps for the generation of vital UV-A and -B radiation.

We therefore urge you to consider the implementation of an appropriate exemption for "*special purpose products*" for animal keeping/husbandry, so that animal welfare and species conservation in the European Union can be ensured not only temporarily, but more importantly, in the long term.

If you may have any further questions, please do not hesitate to contact the undersigning associations.

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<https://www.aedpac.com/>

AGARK DGHT – Arbeitsgemeinschaft Amphibien- und Reptilienkrankheiten der DGHT e.V., Germany

<https://ag-ark-1.jimdosite.com/>

Arbeitsgruppe Weichfresser e.V., Germany

<https://weichfresser.de/>

AIPA – Associazione Italiana Piccoli Animali, Italy

<https://www.aipaonline.it/>

Auffangstation für Reptilien München e.V., Germany

<https://www.reptilienauffangstation.de/>

Aviornis International Deutschland, Germany

<https://www.aviornis.de/>

AZ - Vereinigung für Artenschutz, Vogelhaltung und Vogelzucht e.V., Germany

<https://www.azvogelzucht.de/>

BAG - Bundesarbeitsgruppe Kleinsäuger e.V., Germany

<https://www.bag-kleinsaeuger.de/>

BHS - British Herpetological Society, United Kingdom

<https://www.thebhs.org/>

BNA - Bundesverband für fachgerechten Natur-, Tier- und Artenschutz e.V., Germany

<https://www.bna-ev.de/>

BTK – Bundestierärztekammer e.V., Germany

<https://www.bundestieraerztekammer.de/>

CASC - Companion Animal Sector Council, United Kingdom

<https://cask.org.uk>

CC - Citizen Conservation Foundation gGmbH, Germany

<https://citizen-conservation.org/>

DGHT - Deutsche Gesellschaft für Herpetologie und Terrarienkunde e.V., Germany

<https://dght.de/startseite>

Dibevo, The Netherlands

<https://dibevo.nl/>

DTG - Deutsche Tierpark Gesellschaft e.V., Germany

<http://www.deutsche-tierparkgesellschaft.de/>



Dutch-Belgian Turtle & Tortoise Society, The Netherlands

<https://www.trionyx.nl/>



DVG - Deutsche Veterinärmedizinische Gesellschaft e.V., Fachgruppe Zier-, Zoo- und Wildvögel, Reptilien, Amphibien und Fische, Germany

<https://www.dvg.net>



DVTH - Dachverband der Tierhalter e.V., Germany

<http://dv-th.de/>

DWV - Deutscher Wildgehege-Verband e.V., Germany

<https://www.wildgehege-verband.de/>



EATA - European Aquarium and Terrarium Association, Germany

<http://eata-online.org/>



EAZA - European Association of Zoos and Aquaria, The Netherlands

<https://www.eaza.net/>



EAZWV - European Association of Zoo and Wildlife Veterinarians, Belgium

<https://www.eazwv.org/>

EPO - European Pet Organization, The Netherlands

<https://www.europets.org/>



ESF - European Studbook Foundation, The Netherlands

<https://studbooks.eu/>



ESV - European Snake Society, The Netherlands

<https://www.snakesociety.nl/index-e.htm>



ETA - European Turtle Alliance, The Netherlands

<https://www.turtlesurvival.eu/>



FBH - Federation of British Herpetologists, United Kingdom

<https://www.thefbh.org/>



FedernHilfe e.V., Germany

<https://www.federnhilfe.de/>



Frogs and Friends e.V., Germany

<https://www.frogs-friends.org/de/>



GAV - Gesellschaft für Arterhaltende Vogelzucht e.V., Germany

<http://www.gav-deutschland.de/>



HTVÖ - Herpetologische Terraristische Vereinigung Österreich, Austria

<https://www.htvoe.at/verein.htm>

# INTERESSENGRUPPE PHELSUMA



ÖSTERREICHISCHER DACHVERBAND  
SACHKUNDIGER TIERHALTER  
MIT TIER-, NATURL- UND ARTENSCHUTZ



Syndicat des professionnels de l'animal familial



Stichting Platform Verantwoord Huisdierenbezit



SDAT  
Schweizerischer Dachverband  
der Aquarien- und Terrarienvereine  
www.sdat.ch



Stiftung  
Artenschutz

Tierärztliche Vereinigung  
für Tierschutz e.V.



Verband Deutscher Vereine für  
Aquarien- und Terrarienkunde e.V. 2011-1911

IGP - Interessengruppe Phelsuma, Germany  
<https://www.ig-phelsuma.de/>

IHS - International Herpetological Society, United Kingdom  
<https://www.ihs-web.org.uk/>

ISV - Internationale Schildkröten Vereinigung, Austria  
<http://isv.cc/>

NHF - Nordisk Herpetologisk Forening, Danmark  
<https://www.nhf.dk/>

NZB - Norges Zoohandlers Bransjeforening, Norway  
<https://www.nzb.no/>

OATA - Ornamental Aquatic Trade Association Ltd., United Kingdom  
<https://ornamentalfish.org/>

ÖDAST - Österreichischer Dachverband Sachkundiger Tierhalter, Austria  
<http://oedast.at/>

ÖGH - Österreichische Gesellschaft für Herpetologie, Austria  
<https://herpetozoa.at/>

ÖVÖ - Österreichischer Verband für Vivaristik und Ökologie, Austria  
<https://oevvoe.org/>

OFI - Ornamental Fish International, The Netherlands  
<https://ofish.org/>

OZO - Österreichische Zoo Organisation, Austria  
<https://ozo.at/>

PRODAF - Syndicat des professionnels de l'animal familial, France  
<https://www.prodaf.org>

PVH - Stichting Platform Verantwoord Huisdierenbezit, The Netherlands  
<https://www.huisdieren.nu/>

SDAT - Schweizerischer Dachverband der Aquarien- und Terrarienvereine, Switzerland  
<https://www.sdat.ch/>

Stiftung Artenschutz, Germany  
<https://www.stiftung-artenschutz.de/>

TVT - Tierärztliche Vereinigung für Tierschutz e.V., Germany  
<https://tierschutz-tvt.de/>

VDA - Verband Deutscher Vereine für Aquarien- und Terrarienkunde e.V. gegr. 1911, Germany  
<https://vda-online.de/>



VDW - Verband Deutscher Waldvogelpfleger und Vogelschützer e.V., Germany  
<https://www.waldvogelverband.de/>

VdZ - Verband der Zoologischen Gärten e.V., Germany  
<https://www.vdz-zoos.org/>

ViVe - Vivaristische Vereinigung e.V., Germany  
<https://viveweb.de/>

VZT - Verband der Zootierärzte, Switzerland  
<https://www.zootieraerzte.de/>

Wildtier- und Artenschutzstation in Sachsenhagen e.V., Germany  
<https://wildtierstation.de/>

WKO - Wirtschaftskammer Österreich – der österreichische Zoofachhandel, Austria  
<https://www.zoofachhandel.at>

WPA - World Pheasant Association, Sektion Deutschland e.V., Germany  
<https://wpa-deutschland.de/die-wpa/>

ZGAP - Zoologische Gesellschaft für Arten- und Populationsschutz e.V., Germany  
<https://www.zgap.de/>

ZOORF – Zoobranschens Riksförbund, Sweden  
<https://www.zoorf.org>

ZZF - German Pet Trade & Industry Association e.V., Germany  
<https://www.zzf.de/>

Sincerely yours,

Dr. Gisela von Hegel  
 BNA President

Dr. Martin Singheiser  
 BNA Managing Director

## EU regulation on lighting products endangers both animal welfare and *ex situ* species conservation

Current EU directives, namely

- EU 2019/2020 laying down eco-design requirements for light sources and separate control gears pursuant to Directive 2009/125/EC of the European Parliament and of the Council and repealing Commission Regulations (EC) No 244/2009, (EC) No 245/2009 and (EU) No 1194/2012
- EU 2019/2015 supplementing Regulation (EU) 2017/1369 of the European Parliament and of the Council regarding energy labelling of light sources and repealing Commission Delegated Regulation (EU) No 874/2012 and
- 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment

have serious negative effects on animal welfare and *ex situ* species conservation in Europe due to a ban of various lighting products used for animal husbandry not only in the private but also in the public and professional sector like zoos and aquaria.

Therefore, the above signing associations ask the EU to enable exemptions for animal keeping/husbandry and species conservation on a permanent and technology-open basis.

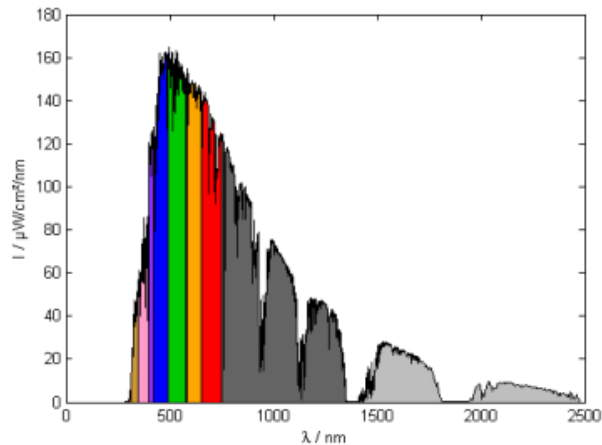
### Background on EU-regulations

In the previous directive EU 1194/2012 on lighting products, “*special purpose products*” for pet care, (Article 2, 4(a)(i)) have been mentioned. All light sources not only emitting visible light but also ultraviolet rays and infrared heat rays, as used for e.g., reptile or ornamental bird keeping as well as poultry farming could be developed with respect to the physiological requirements of the animals. However, such a general exception is currently lacking in the underlying EU directives listed above. This means that some light sources are already forbidden since March 2023. For example, only products with special requirements, e.g., emitting UV radiation (no EEK label required according to exemption (EU) 2019/2015 Annex IV 3. c) UV radiation > 2mW/klm), infrared light (no EEK label required according to (EU)2019/2015 Art. 2 para 1a) or blue light via LED ((EU) 2019/2015 Art. 2 para. 1 d.) can be sold.

A similar situation applies for those lamps emitting UV radiation based on mercury in discharge lamps. They will be forbidden in future as well (2011/65/EU), since in exemptions of those lamps used for special purposes, pet care was not mentioned either. Currently, those lamps are exempted from restrictions until February 2025. However, an exemption might be possible in future as well, but these time-limited exceptions are not useful to guarantee both animal welfare and species conservation in long-term periods. Moreover, although some products might be allowed on one hand since they emit UV radiation, but they might be forbidden in future on the other hand because of a ban of mercury in lighting products. But it is important to know, that two emission lines in the spectrum of mercury occur at 296,73 nm and 312,56 nm – both lines are in the range of UV-B which is very important for the physiology of reptiles and other organisms as outlined below.

### The different components of light

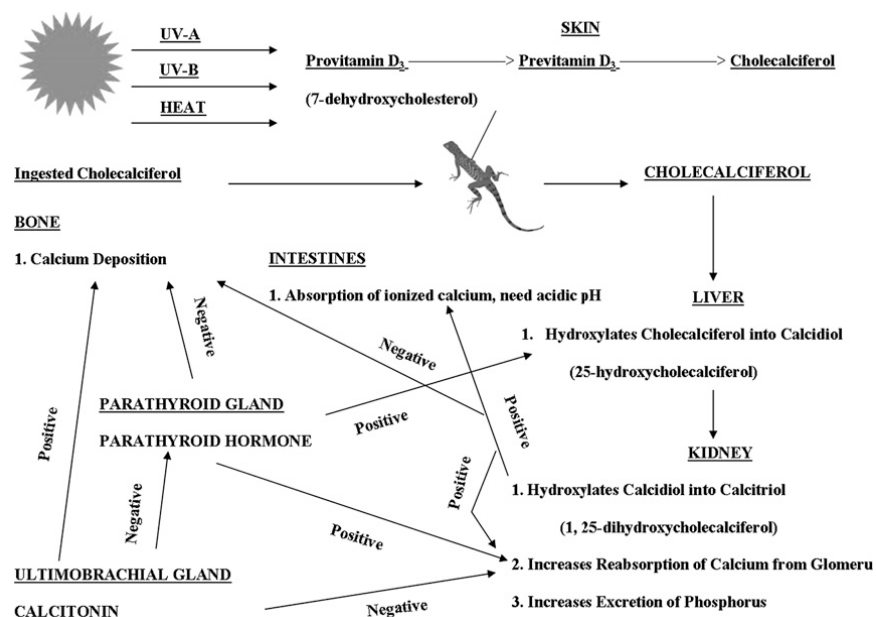
The spectrum of light is very complex and so is the energy  $W/m^2/nm$  in relation to the wavelength of light (nm, see Figure 1). In the range of 250-400 nm, ultraviolet light (UVC, UVB and UVA) is emitted followed by visible light (400-700 nm in the human vision spectrum). Infrared light (IRA, IRB and IRC) can be found in the range of 700-10.000 nm. The energy per wavelength is furthermore modified by different factors like annual season, absorption of the atmosphere, landscape (rain forests vs. desert) and time (early morning/late evening vs. Noon). During evolution, animals have adapted to very different combinations as well as ranges of “light” (UV radiation, visible light, and IR light) like frogs in the rainforest in South America and Bearded Dragons in the sandy and rocky deserts of Australia.



**Figure 1:** Spectrum of light. Energy  $W/m^2/nm$  is plotted against the wavelength. Source of figure: <https://www.licht-terrarium.de/strahlung/einheiten>

### UV-light

- UV-C radiation is emitted at wavelengths below 280 nm and has negative effects on animals due to a damaging of cells. UV-C radiation in lighting products dedicated for animal husbandry thus must not be included.
- UV-B radiation (280-315 nm) is vital for calcium metabolism of animals. In the uppermost epidermal layer of reptiles, Provitamin D<sub>3</sub> is converted to Previtamin D<sub>3</sub> which itself is metabolized to Vitamin D<sub>3</sub> (cholecalciferol) which is stored in the liver and kidney to regulate plasma calcium level as well as bone growth (see Figure 2). For this metabolic process, not only UV-A and UV-B radiation are needed but also Infrared-A radiation. Calcium is not only required for growth of bones and turtle shells but also for egg production in females. A deficiency of both Vitamin D and/or UV-B radiation can result in severe health damages like metabolic bone disease, fractures, softening of shells of turtles as well as the production of wax eggs. However, an overdose of vitamin D<sub>3</sub> can be harmful to animals as well. Such effects are called hypervitaminosis. UV-A radiation reduces excess vitamin D<sub>3</sub> and balances the titer of plasma calcium level. Thus, both UV-A as well as UV-B are required for both diurnal and crepuscular animals, and even nocturnal animals have been recorded to occasionally bask in sunlight.
- UV-A radiation (315-400 nm) is used by many animals - like anoles, chameleons, etc. – for intraspecific communication. It is furthermore required for calcium-homeostasis in amphibians, reptiles, and birds (see above). Furthermore, many bird species seem to be tetrachromatic having receptors for UV-A radiation.



**Figure 2:** Calcium and cholecalciferol homeostasis and disease pathophysiology. Reference: Klaphake 2010.



## Visible light

Visible light (400-780 nm) is detected by almost all species of different taxa. However, the sensors to detect visible light differ between taxa from simple eyespots in *Euglena* with small absorption spectra up to compound eyes of arthropods (insects and crustaceans) and eyes with lenses as used by fish, amphibians, reptiles, birds and mammals with up to four absorption maxima extending into the UV range. Vision is used to orient in space, to control the day-night rhythm, to recognize potential threats, to detect prey and to communicate with conspecifics.

## Infrared light

- **Infrared-A**

Infrared-A (780-1.400 nm) is the most important heat source for thermoregulating animals, as it is recognizable, and it penetrates all the way through the epidermis into the dermis and even somewhat into subcutaneous tissue (see Figure 3). Therefore, Infrared-A radiation is used for thermoregulation by many species of different taxa.

- **Infrared-B/C**

Infrared-B (1.400-3.000 nm) and Infrared-C (3.000 nm – 1 mm) are absorbed by the epidermis and cannot penetrate to deeper layers of the dermis or other tissues (see Figure 3).

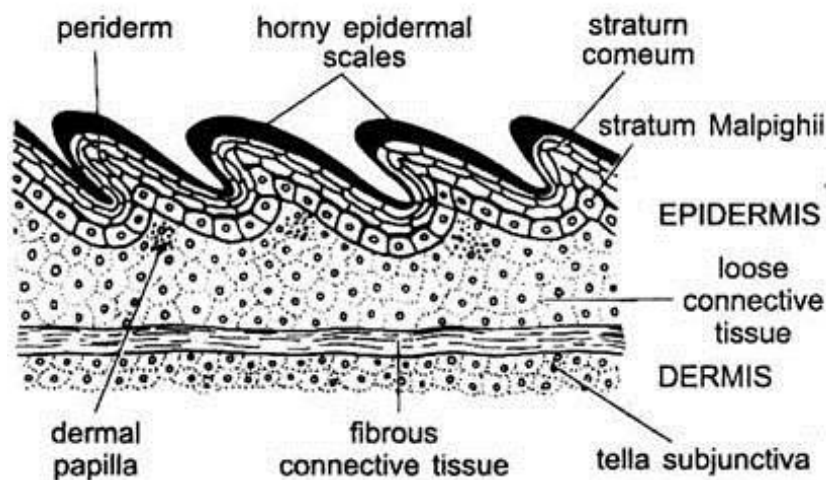


Fig. 41.17. V.S. of skin of lizard.

**Figure 3:** Cross section of a skin of a lizard illustrating the different layers as scales on top followed by the epidermis and the dermis. Reference <https://www.notesonzoology.com/vertebrates/integument-in-different-classes-of-chordates-zoology/8941>

As laid out, many different components of light are mandatory to guarantee animal welfare. It is still very complex to technically reproduce the spectrum of natural light, although some products available for animal husbandry come close. However, not all species do have the same requirements about the illumination of their vivarium and therefore, the gold-standard of a lighting product might not be suited for each species.

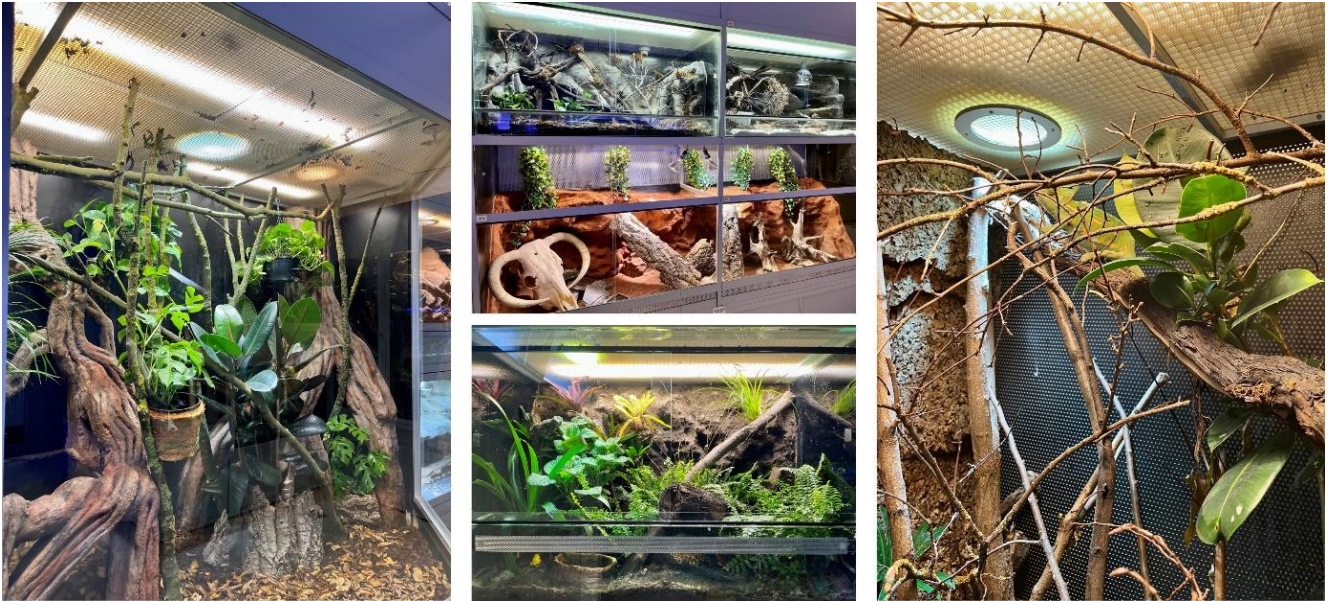
To achieve a sun-like spectrum, generally a combination of different lighting products is used to tailor the illumination to the specific requirements of a species always consisting of UV-A, UV-B, visible light and Infrared-A (see also Figure 4 and Figure 5):

- T5/T8 linear fluorescent bulb combined with an incandescent bulb
- LED fixture combined with an incandescent bulb and/or UV emitting products
- Metal Halide bulb combined with an incandescent bulb and/or T5/T8 linear bulbs or LED fixture
- Mercury Vapor bulb combined with an incandescent bulb and/or T5/T8 linear bulbs or LED fixture
- And even combinations of 3 different lighting/heating combinations for the more demanding species, always tailored specifically to each species, and always consisting of UVA, UVB, Visible Light and Infrared-A.



## Requirements of amphibians, reptiles and birds

Comparing the habitat of a golden dart frog (*Phylllobates terribilis*) in the rainforests of Colombia with the Australian desert where the bearded dragon (*Pogona vitticeps*) can be found shows the complexity of light that has to be fulfilled to keep these species according to national animal welfare acts. But nowadays, it is possible to match the needs of almost every species due to a huge variety of lighting products available. Sometimes a single light source might be sufficient to ensure animal welfare, but mostly only the combination of different lighting systems allows a replication of lighting conditions as in the natural habitat. Furthermore, animals – whether their natural habitat originates in the tropical rainforest or desert – do not spend the entire day in the sun. Reptiles bask in the morning to increase their body temperature and to become active but at Noon they often spend in shady areas to prevent overheating. Therefore, each enclosure must allow the animals to choose their temperature of comfort by creating a thermal gradient within the enclosure (Figure 4, Figure 5).



**Figure 4:** Details of terraria of different sizes with various combinations of lighting systems that match the needs of the species kept inside. As can be seen, all terraria are equipped with a basic illumination and basking spots emitting UV-A/B radiation and thus containing mercury. The terrarium on the left-hand side also contains an incandescent basking bulb.

## Current restrictions of lighting systems for animal husbandry

Actually, incandescent basking bulbs are banned in the EU due to EU 2019/2015 as long as they do not emit UV radiation, infrared light or blue light via LEDs, with the exception of lighting systems fulfilling all of the following conditions: “E27 cap, clear envelope, power  $\geq 100$  W and  $\leq 400$  W, CCT  $\leq 2500$  K, specifically designed and exclusively marketed for infrared heating”. It is relevant to mention that these conditions do not suit the conditions needed to keep most species (amphibians, nocturnal animals, hatchlings and youngsters....) according to their physiological needs, since for example the power of more than 100 W is too high for small enclosures (terrariums). Here, lighting systems with less power (e.g., 25-100 W) are currently used for private and professional animal husbandry (see Figure 4). Depending on size of the enclosure several lighting systems with less power are combined to realize the physiological prerequisites of the species kept.

It is also important to know that diurnal and crepuscular reptiles associate heat with light to regulate their body temperature. Moreover, it is not the temperature as such that is important for reptiles. What is important is the power density of the light/heat beam. Therefore, infrared bulbs and spots are of little to no use for reptiles since the visible component of light is lacking and the power density is wrong. Infrared bulbs can merely be used to increase the ambient temperature, but do not contribute to the thermoregulating and biological process needed for conversion of Vitamin D3.

LEDs transmit visible light and probably will also emit UVA and UVB radiation in sufficient quality and spectrum in future, but the IR-A power density component is lacking in those devices. Combining infrared bulbs and spots with LED devices will not be suitable for most of the species since the proportion of visible and IR radiation does not match. Combining conductive Infrared-C heat-emitting devices like heat pads, heat cables or carbon heaters with LEDs is also of little to no use for animals, since the visible light is reaching the animal from above, whereas



IR-radiation from the heat pad is coming from below or the side in the enclosure and thus will create contradictory gradients of visible and IR-C rays. Moreover, these heating systems only produce Infrared-B and -C radiation which do not optimally contribute to thermoregulation, homeostasis and well-being of animals. Conductive Infrared-C heat-emitting systems can only be used to increase the ambient temperature, and thus need to be applied in combination with sufficient lighting systems.

However, incandescent basking bulbs emit a combination of visible and infrared light, especially infrared-A. It is the combination of infrared-A and UVB that makes it possible for reptiles to produce vitamin D3, one of the most important components of the metabolic processes for the proper functioning of the reptile's most important organs, preventing cardiovascular diseases and stimulating the immune system, as well as regulating bone formation and density. Reptiles and amphibians simply need this recognizable Infrared-A heat source to actively thermoregulate. Therefore, basking spots in combination with UV lights, like Metal Halide bulbs, Mercury Vapor bulbs, Compact Fluorescent bulbs or Linear Fluorescent bulbs, are necessary to establish the microclimate required for most species. Both types of lighting systems might be banned in future.



**Figure 5:** Overview of lighting systems for amphibian and reptile keeping as used for private and professional husbandry. As can be seen, some of the products are incandescent basking bulbs whereas others are UV emitting lamps containing mercury. Incandescent basking bulbs are currently forbidden within the EU whereas UV-emitting lighting systems might be forbidden in future according to RoHS. The exception for products with the conditions “E27 cap, clear envelope, power  $\geq 100$  W and  $\leq 400$  W, CCT  $\leq 2\ 500$  K, specifically designed and exclusively marketed for infrared heating” does not apply for many lighting systems used for animal husbandry.

## Summary

The undersigning organizations acknowledge the need for lighting systems that are energy efficient and/or free of hazardous substances like mercury. Nonetheless, the EU has set up exceptions of products that neither are energy-saving nor free of mercury. Unfortunately, dedicated exceptions for “special purpose products” like pet keeping as mentioned in EU 1194/2012 are currently lacking. The actual legislative framework either bans products required to guarantee animal welfare and species conservation or might exclude these products in future because of RoHS. Current exceptions do furthermore not apply for many products not only

used but also required in animal husbandry. This situation can result in severe deficits for animal welfare and thus also contradicts EU-wide efforts and actions in species conservation.

**We therefore urgently ask the European Commission to include an exception of products used for animal keeping/husbandry in the EU legislative framework for lighting products.**

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