

I would like to participate in the consultation regarding the possible prolongation of the exemption 4 for mercury in other discharge lamps for special purposes.

I am a German citizen and the Managing director of Celinius Co., Ltd. in Taiwan. Our company distributes power supplies for special discharge lamps used in Industrial equipment that relies on the properties of discharge lamps with mercury content. Mercury is a key component to enable high energy density light sources with a substantial UV-content in closed environments.

The UV components of such emissions are used among others in the following areas:

1. Water purification without the use of added chemicals in the beverage production
2. Waste water treatment to prevent biological contamination.
3. UV-drying of printing on food packaging
4. Endurance testing for plastic material and Anti-UV-coating to enable accelerated testing of materials to simulate the exposure to sunlight
5. Testing equipment of solar cell wafers
6. UV-edging of silicon wafers in the semiconductor processes
7. Visual light in data and video projectors used in millions of class rooms around the world.

Celinius is specialized distributor of components for such equipment and several specialized small and medium sized companies located in the European Union are occupying a dominant position in niches where this technology is applied, globally. The complete ban of mercury and therefore the inhibition of the basic physical principle to artificial create a highly concentrated UV-source in my opinion will lead to the following consequences:

- a.) De-industrialization in a number of specialized industries.  
Distributors of finished products will be forced to import the finished goods from Asia rather than producing those in Europe due to the absence of affordable UV-sources
- b.) Substantial electrical waste especially that of millions of video and data projectors, where the useful life of such products can no longer extended by simply exchanging the projector lamp.
- c.) Biological hazards and risk of water-born diseases originating in beverage companies who can no longer disinfect their ingredients properly prior to bottling

Some people argue, that UV-LEDs are an alternative technology. Our company already uses UV-LEDs for curing small gluing spots, however the technology is not capable to deliver the energy doses required for high capacity processes. Due to the thermal limitation and degradation of the materials used, I at this point of time cannot foresee that this technology will be able to replace special discharge lamps adequately any time soon.

My recommendation for the regulator is to limit the use of mercury containing lamps to equipment applications, where the light source is physically contained from the public and is used for controlled exposure only. This will ban the use in High-Bay discharge lamps where viable LED-alternatives are meanwhile available but will not kill a highly sophisticated machinery industry that offers employment to thousands of well paid and highly educated Europeans. Given the cost of such special lamps, there is a natural desire to preserve the useful life of such lamps and avoid wasting it anyway. In essence, the benefit this technology offers in a wide range of industrial processes in my humble opinion far outweighs the ecological benefit to reduce the possible tiny spill of mercury originating from those few special lamps.

I am convinced that the biological hazards from food contamination are a significantly bigger threat to the European society compared to the small amount of mercury.

I fully support the ban of mercury in General Lighting where also our company offers much more environmental sustainable LED-products with a long lifetime and a human-friendly light spectrum compared to traditional fluorescent lamps which occupied the majority of consumed mercury during the past decades, however when the application requires a high energy density such as in optical equipment and projectors, LEDs simply cannot compete. In data projectors, you typically create 150W across an arc of 1mm length. A typical 5050LED only allows for up to 3W for an area that is optically 4 times the size and the since the LED cannot be hotter than around 100 degrees C, the additional cooling effort is tremendous. The surface temperature of the glass of the burner in special discharge lamps typically reaches 950 degrees C and therefore, the temperature difference between the ambient temperature and the glass temperature enables a simpler heat transfer within the equipment where such light source is used.

Please extend the exception and preferably rephrase it and make it permanent to enforce a ban in general lighting whereas in special lighting, where either the UV-component or a high energy density is required, the use is allowed in contained environments.

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**Answer provided as is by Florian Heike on behalf of Celinius Co. Ltd on the 27<sup>th</sup> of May 2021.**