



We create chemistry

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OEKO-Institut e.V.  
RoHS EXEMPTIONS  
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**Re: RoHS Exemption request 2013-2 – QD Vision**

Dear Dr. Gensch,

BASF is a leading supplier of Advanced Materials to the semiconductor, display, lighting and photovoltaic industries. We support our customers to develop innovative solutions targeting better performance as well as improved energy efficiency.

BASF has recently invested in QD Vision and signed a joint development agreement with QD Vision for a quantum dot-enhanced backlight and a color filter for use in LCD displays. This cadmium selenide technology is, based on our internal assessment, the benchmark in energy efficiency and will enable displays to show millions more colors than today's Ultra High-Definition (UHD) or 4K displays. By jointly optimizing the technology, we expect to achieve next generation color standards (REC2020) and to improve energy efficiency of display systems in the use phase further.

The EU is currently reviewing the RoHS exemption for the use of cadmium selenide in displays. We support QD Vision's arguments to prolong the RoHS exemption. Confirmed by the assessments provided by QD Vision, cadmium selenide based quantum dots not only enable better color performance but also higher quantum yields and therefore superior energy efficiency compared to indium phosphide based solutions. This results in significantly reduced cadmium and heavy metal emissions from power plants during the use phase of displays and hence a net benefit to the environment. The atmospheric emissions of heavy metals are rated more critical as they are bio-accessible and enter the food chain, whereas the comparably small amount (< 2 mg in case of QD Vision's solution) of cadmium required for a display is hermetically encapsulated and can be easily recycled. We also note that the alternative of indium phosphide has a harmonized classification as carcinogenic, 1B.

We therefore believe that the RoHS exemption for this application is justified and would welcome its prolongation by the EU institutions for a period of 5 years.

Yours truly,

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