

Position paper on the revision of the RoHS Directive.

2. May 2010

Bellona supports the joint position paper on the revision of the RoHS directive between the European Environmental Bureau (EEB), the Health and Environment Alliance (HEAL), and Women in Europe for a Common Future (WECF). We would like to add in this paper an elaboration on our position in favour of an “open scope” for the directive. The background for this is that the Council and the Parliament are considering giving photovoltaic (PV) panels based on cadmium telluride (CdTe) an exemption from the “open scope” approach to a revised RoHS directive.

Bellona wants an open scope for the Directive with no exemption for any solar panels.

Both first and second generation solar panels can be produced as energy and emission efficiently without hazardous substances as with such substances. Including all solar panels in the scope of RoHS would thus give the solar industry an incentive to further develop without the use of hazardous substances. The substances included in the RoHS can, and should, be avoided in solar panels as in all other electronic and electrical products (EEEs). Because PV panels without such substances represent a mature technology, **including solar panels of all types in the directive would not affect the European Union’s ability to achieve its renewable energy and energy security goals.**

All types of solar panels should be included in RoHS, with no exemptions, because:

1. Cadmium and cadmium compounds are highly toxic. A causal relationship has been demonstrated between exposure to this carcinogen and severe health risks. Cadmium must therefore be avoided in every use where it is possible to avoid it.
2. Inclusion of solar panels in RoHS would give incentives to the European solar industry to develop in an environmentally friendly direction, without harmful substances.
3. No exemption is needed to reach European renewable energy or energy security goals since both first and second generation solar panels can be produced without hazardous substances today. The panels with cadmium has only a 13% share of the PV panel market in Europe today and this can easily be covered with non-cadmium technology.
4. An exclusion of CdTe-based panels is of economic interest to mainly one company, with the 13 % market share, while the rest of the market is covered by environmentally superior products that can comply with the RoHS directive.
5. Japan and the EU have already prohibited the sale of most products containing cadmium for health and safety reasons. In Japan, this includes CdTe-based panels.
6. Even if the PV-industry might go for a voluntary take-back scheme, this is not a guarantee that hazardous substances in the panels do not leak along the panels’ lifespan, through risks related to bankruptcy of producers, fires, accidents, breakage, exports etc. Also, there is an uncertainty related to the fact that panels produced with cadmium have not yet been tried for their full life time.

The negative environmental dangers of excluding cadmium based panels from the regulations of the RoHS far outweighs the claimed benefits this supposedly has.

Background document on the position paper on revision of the RoHS directive

Bellona believes that a robust RoHS Directive, the goal of which is to minimize the impact of electrical and electronic equipment on health and environment, must have an open scope. This means that the directive must cover as many products as possible. As such, we strongly advocate that it must include all PV technologies. Some solar panels are today produced in a way in which it can comply with the directive and others are not. We believe that including all PV technologies will give an incentive for the industry to develop along the cleaner track and as such is in the interest of promoting a truly clean solar industry. In addition to inclusion of other PV technologies, the inclusion and thereby phasing out of CdTe technology will serve to address the following issues both in product manufacturing and throughout product lifecycles.

1. Safety & sustainability

Cadmium and cadmium compounds are highly toxic. A causal relationship has been demonstrated between exposure to this carcinogen and severe health risks. Japan and the EU have already prohibited the sale of most products containing cadmium for health and safety reasons and a similar logic should apply to CdTe panels, which have not been proven to be safe and are already banned in Japan.

There is a lack of adequate scientific analysis and evidence for the statements asserting the safety and environmental friendliness of cadmium, as presented by the cadmium industry. An exclusion of CdTe PVs will only serve to deter this industry from developing truly clean PV panels, which still represent the majority of the market today.

Furthermore, the use of a scarce resource such as tellurium in the production of CdTe PV modules limits this technology's potential role as a large-scale renewable energy supply technology.

2. Hazardous waste

A CdTe PV module is expected to have a lifetime of 25 years. To date, no CdTe panel has lived its lifetime and almost all environmental tests performed have assumed that these glass panels will never break neither as waste, construction material nor during fires. We are therefore facing large uncertainty as to what in fact will happen to the cadmium. As tests to date are limited and inadequate, it is not possible to determine the real end-of-life hazards.

Despite assurances of certain industry players that a take back scheme is in place, an industry voluntary agreement for a common recycling scheme has not been agreed upon. Even though ambitions are higher than the 65 % prescribed in the WEEE Directive, this is obviously far from a

100% collection and recycling rate. Furthermore, a 100% rate can never be guaranteed. Still, such an unprecedented collection rate is used in life cycle analyses financed by the CdTe industry.

The various PV technologies face very different risks and costs, which will mean difficulties in agreement on financial or operational aspects of a common recycling scheme. Therefore, end-of-life issues should be addressed in the design state of product development, instead of waiting for waste to accumulate before addressing the problem.

3. Climate change targets can be reached with non-toxic panels

The inclusion of all PV panels in the scope of the RoHS Directive will ensure that cadmium and other toxic substances regulated by the directive, such as lead, are not used in these products. This will give incentives for the industry to develop environmentally friendly PV panels.

Including all PV panels into the directive will not lead to a significant reduction of supply capacities, which will “endanger” the EU’s ability to meet its 2020 objectives. The energy payback time of silicon products is also approaching one year, thereby providing solutions as CO₂-lean as CdTe PV. Currently, CdTe manufacturers account for an estimated share of 13% of total solar photovoltaic supply capacities and are expected to maintain this position also in 2010. Current supply capacities of PV panels exceed estimates of PV demand increase (23% to 31% in 2009, 23% to 36% in 2010 and 23% to 37% in 2011). Clearly, the phasing out of cadmium in PV panels will still allow for the PV industry to address European climate and energy challenges.

4. Energy efficiency

Silicon cell-based modules produce more energy per area than CdTe modules under all lighting and temperature conditions contributing to energy production. A silicon-based module with 14 % efficiency (typical value in 2010) produces 25% more energy net per installed area than CdTe based modules with 11% efficiency (top of range value) over a module lifetime of 25 years. There are also commercial silicon modules available well above 14% efficiency, making the difference even larger.

¹ O’Rourke, S. (2009) Solar Photovoltaic Industry. Deutsche Bank presentation at the Institute for Analysis of Solar Energy. April 24, 2009.

¹ PV Industry Handbook 2009