

Questionnaire for EEE newly in scope: Electric Bicycles

Technical and socio-economic considerations concerning a possible exclusion for electric bicycles from the scope of RoHS

Background

Article 24(1) of the RoHS Directive¹ states that:

“No later than 22 July 2014 the Commission shall examine the need to amend the scope of this Directive in respect of the EEE referred to in Article 2, and shall present a report thereon to the European Parliament and the Council accompanied by a legislative proposal, if appropriate, with respect to any additional exclusions related to that EEE.”

The Oeko-Institut has been appointed within a framework contract to provide the European Commission with further input aimed at substantiating the impact assessment of possible adjustments to the scope of the RoHS Directive.²

In 2008 the European Commission launched the recast of the RoHS 1 Directive 2002/95/EC in order to strengthen and adapt the existing law. This Commission proposal introduced new definitions and extended the scope of products required to comply with the Directive under the original RoHS 1 regime.

According to Article 2(4)(f) of RoHS 2 (Directive 2011/65/EU) the Directive does not apply to: *“...means of transport for persons or goods, excluding electric two-wheel vehicles which are not type-approved”*. It is thus understood that all electric two-wheel vehicles, which are not type approved are newly in the scope of RoHS and would thus need to comply among others with the RoHS substance restrictions.

Following an earlier study, an exclusion of electric bicycles from RoHS 2 is under consideration and the European Commission has requested input to substantiate the preparation of an impact assessment, comparing the possible impacts relevant for an exclusion scenario with the current scenario in which electric bicycles are in scope and must comply among others with the RoHS substance restrictions.

The definition of electric bicycles varies greatly, with most EU countries referring to some form of electric assistance with which the cycle is equipped.

¹ Directive 2011/65/EU, available under:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32011L0065:EN:NOT>.

² Contract is implemented through Framework Contract No. ENV.C.2/FRA/2011/0020 led by Eunomia

The Regulation (EU) No 168/2013 of the European Parliament and of the Council of 15 January 2013 on the approval and market surveillance of two- or three-wheel vehicles and quadricycles, regulates the definition of type approved vehicles in the EU. According to Article 2.2(h), it does not apply to:

“...pedal cycles with pedal assistance which are equipped with an auxiliary electric motor having a maximum continuous rated power of less than or equal to 250 W, where the output of the motor is cut off when the cyclist stops pedaling and is otherwise progressively reduced and finally cut off before the vehicle speed reaches 25 km/h;...”

It is yet to be established which types of electric bicycles fall under the definition of non-type approved vehicles, and are thus to be included at present in the scope of the RoHS Directive and subject to the RoHS substance restrictions.

One example understood to belong to this group regards pedelecs. Pedelecs are a sub-category of electric bicycles. Pedelecs need the user to pedal for the motor assistance to kick in. The amount of assistance provided is determined via a sensor. The assistance stops automatically at 25 km/h or when the user stops pedalling. Thus pedelecs are understood not to be type approved and thus newly in the scope of RoHS 2, though not previously in the scope of RoHS 1.

The objective of this consultation and the review process is to collect and to evaluate information and evidence to establish the various environmental, the economical and the social impacts that the various policy options may result in. Additionally, information clarifying the application of RoHS regulated substances (see Annex II of Directive 2011/65/EU³) and the technical aspects of their substitution in this product category are also of interest.

The following questions have been formulated to gather more information on non-type approved vehicles that are thus in scope of RoHS 2, as well as information concerning the bicycle industry and its supply chain, concerning possible impacts that they may have in relation with the various scenarios. Input provided in this regard shall be used to review if such bicycles should remain in the scope of RoHS in the future or be excluded from scope.

If you would like to contribute to the stakeholder consultation, please answer the following questions. Please be aware that some of the questions may refer to specific stakeholder groups. Please clarify if certain aspects are of less relevance for your type of organisation or if you understand them to be irrelevant for the possible scenarios of inclusion and exclusion of electric bicycles in the scope of RoHS.

³ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32011L0065:EN:NOT>.

In case parts of your contribution are confidential, please clearly mark relevant text excerpts or provide your contribution in two versions (public /confidential).

Questions

1. Contact Information

- Name: _____
- Organization: _____
- Email: _____
- Telephone: _____

2. Area of activity (more than one is possible):

- ☐ Industry;
- ☐ Retail/distribution;
- ☐ Rent/repair business;
- ☐ Industry/business association;
- ☐ RoHS enforcement;
- ☐ RoHS analysis;
- ☐ Environmental NGO;
- ☐ Consumer NGO;
- ☐ Institute/consultancy;
- ☐ EU Member State Representative;
- ☐ International agency / organisation;
- ☐ Other - Please specify: _____

3. EEE newly in scope

Please specify products of relevance for your organisation that are understood to fall under the scope of non-type approved electric two-wheeled vehicles newly in the scope of the RoHS Directive and provide details regarding the following questions. Please provide information on the sales volumes of bicycles in the EU market for your company or for the enterprises you represent, including forecasted trends for the next 10 years. You may use the table template provided below for this purpose.

- a. Please explain why the vehicle is considered to be newly in the scope of RoHS (you may refer to definition from various legal documents and to the characteristics of the vehicle in question);
- b. Please provide information/data on the number of non-type approved electric bicycles sold over the last five years at EU27 level. If possible please detail

how provided volumes break down according to sales in different Member States;

- c. Please state the share (in € and units sold) of non-type approved electric bicycles vs. conventional bicycles that are sold/repaired/rented by your company or the enterprises you represent;
- d. Please provide information as to the range and average service life of the mentioned vehicle.

Table 1: Input concerning non-type approved electric two wheel vehicles

	Vehicle (if relevant please refer to product sub categories such as Pedelects, etc.
Why is vehicle considered newly in scope	
Vehicle market share in the EU (sales volume and revenue); please reference to general EU market share of electric bicycles and of conventional bicycles	
Global vehicle market share (sales volume and revenue); please reference to general EU market share of electric bicycles and of conventional bicycles	
Average retail price of the products in question	
Price range for the products in question	
Service life	

- e. Please provide information/data on the number of units sold in EU 27 / specific Member States over the last 5 years.
- f. Please provide forecasts of the volume of sales estimated over the next 10 years.

4. Product service life

- a. Please provide information/data on the average product life of the products.
This is relevant as provisions for repair and the availability of spare parts have

to be made, if electric bicycles remain within the scope of RoHS 2. It is possible that the economic life could vary across Member States, but please try to provide best estimates based on your knowledge and experience. Likewise, please specify if certain components are expected to be replaced on a regular basis, such as the battery, etc.

- b. Please state how common the repair of specific parts and components of the vehicle is. Please provide differentiate between parts and components that are electric and those that are not.
- c. Please specify if secondary market operations are common for products/applications mentioned and provide information as to such practices (leasing; renting; secondary sales operated by retailers and/or by consumers, etc.). Please provide detail as to how often such operations occur

5. Bike-ebike conversion kits

Bike-ebike conversion kits are kits intended to convert conventional bicycles to electric bicycles.

- a. Please clarify if your organisation has activities associated with bike-ebike kits (manufacture; sales; installation; etc.)
- b. Please provide information as to the volumes of sales / installations of bike-ebike kits in the EU and beyond over the past 5 years and how these trends are expected to change over the next decade. Please also provide data as to the revenue generated from such activities.
- c. Please provide information as to the presence of RoHS substances in the parts and components of bike-ebike kits.
- d. If relevant, please provide information as to the possibilities of substitution / elimination of RoHS regulated substances in the parts and components of bike-ebike kits – in this regard please refer to Table 3
- e. If relevant, please elaborate as to the stages needed to achieve compliance of bike-ebike kits with the RoHS Directive

6. Compliance of vehicles newly in scope

The RoHS Directive restricts the use of certain hazardous substances in EEE that is to be marketed on the European market (2011/65/EU, Annex II). Annex II specifies maximum concentration values of the different hazardous materials that are tolerated by weight in homogeneous materials

The hazardous substances listed in Annex II at present, as well as the tolerated maximum concentration values (%/weight) are listed below:

- Lead (0,1 %)
 - Mercury (0,1 %)
 - Cadmium (0,01 %)
 - Hexavalent chromium (0,1 %)
 - Polybrominated biphenyls (PBB) (0,1 %)
 - Polybrominated diphenyl ethers (PBDE) (0,1 %)
- a. Please provide information as to the presence of RoHS substances in the vehicles mentioned in section 3 of this document. You may use the table template provided below for this purpose. Please specify what RoHS regulated substances are present in the vehicles specified above, including information as to concentration values and quantities of substance per product.

Table 2: Presence of RoHS regulated substances in non-type approved electric two wheel vehicles

		Vehicle (if relevant please refer to product sub categories such as Pedelects, etc.
Presence of RoHS regulated substances (% weight & quantity of substance):	Lead	
	Mercury	
	Cadmium	
	Hexavalent chromium	
	Polybrominated biphenyls (PBB)	
	Polybrominated diphenyl ethers (PBDE)	

- b. Please list components in which these substances are present beyond these values. Please specify the % of weight of these in the homogenous material⁴, amount or estimated amount of the homogenous material used per unit for non-type approved electric bicycles and/or bike – ebike conversion kits. A non-exhaustive list of possible components of relevance is listed in Table 3 and Table 4 below for your convenience:

⁴ The EU RoHS FAQ Document ([link](#)) explains that „a homogeneous material is either:

- 1) A material with a uniform composition throughout; or
- 2) A material that consists of a combination of materials, that cannot be disjointed or separated into different materials by mechanical actions such as unscrewing, cutting, crushing, grinding or abrasive processes.”

Table 3: Non exhaustive list of components of possible relevance in electric parts (not including the battery)

Electrical part (non-exhaustive)	Sub-Component (non-exhaustive)	banned substance	% weight of the homogeneous material	amount of the homogenous material per unit
Motor / Drive unit	Housing Bearing Shells and bushes Gearing ...			
Control Board	Display Circuit Board Housing Electronic Components			
Torque sensor unit			
Cable and Connectors			
Charging set				

Table 4: Non exhaustive list of components of possible relevance in structural, non-electric components of the bicycle

non-electrical part	banned substance	% weight of the homogeneous material	amount of the homogenous material per unit
Bicycle frame and fork			
Seat			
Seat Post			
Rim			
Tyres			
Spoke			
Nipple			
Hubs			
Chain-rings			
Headset			
Handlebar			
Levers			
Connection elements (screws etc.)			

non-electrical part	banned substance	% weight of the homogeneous material	amount of the homogenous material per unit
Metal Plates			
Bar end			
....			

7. Substitution of RoHS substances in EEE newly in scope

For a product or application to be defined as compliant with the RoHS substance restrictions:

- either the use of RoHS regulated substances must be avoided (either through substitution or elimination⁵); or
- the application must be listed in Annexes III or IV of the RoHS Directive providing an exemption for the use of the RoHS substance in certain cases for a limited period of time.

Please provide information as to the efforts towards compliance that are underway or that are planned for the vehicles and components mentioned above. In your response please consider the following questions. You may use the table template provided below for this purpose.

- Please provide information as to the availability of possible alternatives (substance or technological) on the market. Please refer in your response to possible environmental, social and health impacts related to the use of alternatives if relevant.
- Please elaborate as to their possible use in the vehicles and components mentioned above in terms of the efforts towards compliance.
- Please state if the use of possible alternatives would result in a change of product characteristics, and explain what changes may be relevant in this respect.
- Please explain the various phases that are being undertaken (or that are planned) in order to facilitate the compliance of products, elaborating on the time assumed to be needed for each stage. You may refer to a possible time range, explaining the uncertainties that apply.

⁵ Substitution is understood to regard cases in which the hazardous material can be replaced by using another chemical substance, i.e., a substance alternative. Elimination is understood to regard cases in which the technology in which the RoHS substance is present is replaced so that the need for use of the hazardous substance is eliminated.

Table 5: Availability of alternatives for applications in which RoHS regulated substances are in use

		Component 1	Component 2	Component 3
Availability of alternatives for the relevant RoHS regulated substances	Lead			
	Mercury			
	Cadmium			
	Hexavalent chromium			
	Polybrominated biphenyls (PBB)			
	Polybrominated diphenyl ethers (PBDE)			
Applicability of possible alternatives				
Changes to vehicle / component characteristics resulting from alternative application				
Roadmap towards substitution – required steps and time span				

8. Impacts of compliance

Please estimate what costs and/or benefits your organisation or other stakeholders shall have if one of the following scenarios is to be implemented. Where relevant, please specify how these costs/ benefits are allocated between different vehicles/ components mentioned above.

- All electric bicycles which are not type approved shall be excluded from RoHS through adjustment of Article 2(4);
- Certain types of electric bicycles which are not type approved shall be excluded from RoHS through adjustment of Article 2(4); please refer in your answers to possible sub-groups of relevance in this regard
- All electric bicycles which are not type approved shall remain in the scope of the RoHS Directive and shall be required to comply with the substance restrictions – please refer in this case to the following sub-scenarios:
 - a. Articles 2(2), 4(3) and 4(4) shall remain unchanged in this regard;
 - b. Articles 2(2) and 4(3) shall remain unchanged. A spare part provision shall be added to Articles 4(4), to enable the repair of EEE newly in scope, placed on

the market before 22.7.2019, with RoHS non-compliant cables and spare parts

- c. Article 2(2) shall be incorporated into article 4(3), with the 22.7.2019 as compliance date, thus allowing secondary market operations for non-conform products newly placed on the market before July 2019
- d. Article 2(2) shall be incorporated into article 4(3), with the 22.7.2017 as compliance date, thus allowing secondary market operations for non-conform products newly placed on the market before July 2017

Please differentiate in your response between impacts that are relevant only for activities associated with electric bicycles and between activities associated with bicycles in general (electric and conventional). In this regard please detail:

- a. Possible costs for your organisation or other stakeholders tied with compliance of a specific product category, in relation to the above mentioned scenarios – one-time costs such as investments as well as recurring costs, such as costs for purchasing resources)
- b. Possible benefits that may incur to your organisation or to other stakeholders in relation to the above mentioned scenarios – please clarify when or over what period benefits are expected.
- c. Possible impacts to health and to the environment associated with the scenarios mentioned above
- d. Possible impacts on employment that may be associated with the scenarios mentioned above (impacts on required skills; impacts on number of employees; etc.)
- e. Possible impacts on innovation and competition that the various scenarios may have in regard to your organisations general activities or those tied with a specific product category. Please elaborate in this regard concerning impacts on import and export of products/ applications.
- f. Possible impacts on the supply of certain products or components that are relevant to the various scenarios detailed above – please clarify in this regard if certain products shall need to be taken off the market, and if alternatives shall be manufactured and marketed.

In case parts of your contribution are confidential, please clearly mark relevant text excerpts or provide your contribution in two versions (public /confidential).

Finally, please do not forget to provide **your contact details** (Name, Organisation, e-mail and phone number) so that Oeko-Institut can contact you in case there are questions concerning your contribution.