Regulatory Triage Assessment – Consultation stage

Title of regulatory proposal	Amending Directive 2011/65/EU on the Restriction of the use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS 2) Directive
Lead Department/Agency	Department for Environment, Food and Rural Affairs (Defra)
Expected date of implementation	March 2019
Origin	EU
Date	October 2018
Lead Departmental Contact	Jameson Mashakada, Shelley King
Departmental Triage Assessment	Low cost regulation (fast track)

Rationale for intervention and intended effects

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Directive 2011/65/EU (RoHS Directive) sets out rules on the restriction of six hazardous substances (ten from July 2019) in the manufacture of certain categories of electrical and electronic equipment (EEE) placed on the EU market.

The Directive aims to prevent these substances from entering the production process, thereby keeping them out of the waste stream after the equipment is disposed of at end of life. It also ensures the free movement of goods and equipment across the Single Market by applying the same restrictions to producers placing products on the market across all EU Member States.

The original RoHS Directive (2002/95/EC) had a definition of electrical and electronic equipment that was restricted to equipment that relied upon electrical input for its primary function. The Recast Directive (2011/65/EU) RoHS 2, introduced a new and broader definition of Electrical and Electronic Equipment that will bring equipment that has any function reliant upon electrical input (other than equipment that is explicitly excluded) into scope.

When the RoHS2 Directive was agreed, the EU Commission carried out an impact assessment on the effect that this ‘open scope’ would have before its introduction in July 2019. That Impact Assessment identified a number of unintended consequences of Article 2(2), 2(4), 4(3)/4(4) and 4(5) of the RoHS2 Directive, which would impose restrictions on the sale and resale of repaired and remanufactured goods. The individual sectors affected under the respective articles are presented in detail in the supporting evidence on page 4.

This means that products will become waste, well before the end of their expected lifespan, despite their economic value. This is in direct conflict with the principles of the waste hierarchy that puts reuse and refurbishment above recycling. It is this situation that constitutes a market failure and government intervention is necessary to ensure that the RoHS2 Directive is as effective as possible.

The EU Commission has proposed the amendment of the Article 2(2), 2(4), 4(3)/4(4) and 4(5) of the RoHS2 Directive to remove the affected product categories from the scope of ROHS 2. This will enable the resale and repair of old equipment and clarify issues concerning product scope. Allowing the continuation of the present legal market position without imposing any additional cost burden to business.

Viable policy options (including alternatives to regulation)

The Baseline, this is the current situation we have at the moment i.e. all product categories falling under RoHS 2 are either RoHS compliant or out of scope"

Option 1. The "do nothing" option represents the current RoHS 2 Directive, which has already been transposed into UK Law and as a result of which certain RoHS 2 measures will automatically come into force in July 2019. These measures falling under Article 2(2), 2(4), 4(3)/4(4) and 4(5) will render several currently "out of scope" equipment and devices "in scope". This option will have undesirable environmental and economic impacts on all affected sectors

Option 2. This is the preferred option. Amend the affected articles of the RoHS 2 Directive to rectify the unintended consequences of the current Directive. We recommend this option as it would allow the continuation of the existing legally established position at no extra cost to business.

Initial assessment of business impact

The Baseline
Since this option represents the status quo, there are no cost or benefits to this option. The additional cost to business is zero. Additional benefits to business is also zero.

Option 1.
An earlier impact assessment of the RoHS 2 Directive identified unintended consequences of the Articles 2(2), 2(4), 4(3)/4(4) and 4(5) which would result in significant environmental, economic and social costs with no or only limited benefits. These are detailed in the business impacts section of the supporting evidence found on page 5.

This includes premature waste generation of annually 3000 tonnes of additional Waste electrical and electronic equipment (WEEE) resulting in treatment and disposal cost of £0.041m yearly.

The measures would mean the de-facto end of pipe organ production for the UK market and therefore a loss of an estimated £7m per annum turnover and the loss of over 228 jobs

The inclusion of category 8 and 9 refurbished medical equipment in scope of RoHS2 would result in est. 25%-35% higher cost to hospitals for new equipment (a cost to hospitals of around £24m per annum). Hospitals would also see the loss of revenue from the sale of older equipment of over £8m per annum.

Further impacts include the additional compliance cost and administrative burden placed on the affected businesses. The process of attaining RoHS 2 compliance requires research, development and testing at substantial time and resource cost to business to the order of magnitude of an £3.7m per annum.

There are also non-monetised cost such as the environmental cost of increased waste production, premature product obsolescence, as well as the cost associated with social impacts such as employment; consumers' behaviour; health and wellbeing. Below is an overview of the estimated economic impact until 2029

Estimated economic impacts under Option 1 over the 10 year appraisal period (2019-2028) in millions of £		
	Undiscounted per annum costs	**Total undiscounted costs over 10 years**
Total Compliance cost (Category 8,9 and 11)	*3.7*	37
Total waste disposal cost (category 8 and 9)	0.041	0.41
Loss of resale revenue (category 8)	8	80
Additional cost of having to purchase new machines instead of refurbished ones	24	240
Loss of revenue Pipe Organs (year 1 only)	7.1	71.4
Total cost	**43**	**430**
Present Value		**372**

Option 2. Option 2 would avoid significant economic and social costs as estimated in section 4.2, and is therefore the preferred option. Under this option, the amendment of the RoHS2 Directive would rectify the unintended consequences of the current Directive.

The proposed changes are regulatory and the cost of the measure is estimated to be very low if not negligible, since these would be general administrative cost such as documentation of compliance, and not necessarily affected by the distribution of compliant and non-compliant products. As such this change is largely inconsequential in terms of cost while the benefits of this option would arise from the avoided costs of option 1. Therefore option 2 is the zero impact option.

This option would also help to meet the UKs' policy objective of the correct and regular functioning secondary market, without hampering the objective of the protection of human health and the environment.

One-in, Two-out status

Rationale for Triage rating

The proposed changes are regulatory but the cost of the measure is believed to be very low if not negligible so that this change is largely inconsequential in terms of cost. The preferred option would result in no extra cost to business and as such is the zero impact option.

Departmental signoff (*SCS*): Steve Andrews

Economist signoff : Tom Murray

Better Regulation Unit signoff: Antonia Baker

Supporting evidence

1. **The policy issue and rationale for Government intervention**
An amendment to the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS 2) Directive was published in the EU Official Journal on 21st November 2017. The amendments aim to address a number of unintended consequences introduced by the RoHS2 Directive by amending the following articles;

   a. **Article 2(2)** prevents the recirculation of non-compliant products after 22 July 2019 even if they were placed on the market before this date. This primarily affects the secondary market operations for EEE and pipe organs. Article 2(2) imposes restrictions on repair, replacement of spare parts, reuse, refurbishment and resale of the affected product categories. The result will be an inadvertent ban of new pipe organs being placed on the EU market.

   b. **Article 2(4)** restricts the repair or upgrade of equipment that falls within the scope of the Directive after July 2019, with new cables or spare parts. It also excludes non-road mobile machinery (NRMM) with an on-board power source, which is made available exclusively for professional use, such as professional cleaning machines (which would be caught by the Directive) in comparison to otherwise identical machinery powered by a battery or an on board power supply (which would be exempt).

   c. **Article 4(3)/4(4)/4(5**) affects the use of spare parts and repairs so that from July 2019, products other than some medical devices, could only be repaired with RoHS compliant spare parts and only if the product was not for resale. The products categories most affected by the above mentioned articles are (Category 8) Medical Devices; (Category 9) Monitoring and Control Instruments; (category 11) new-in-scope EEE including Non-road mobile machinery (NRMM) and pipe organs.

1.1 Rationale for Intervention

The UK has already fully implemented the original RoHS Directive from 2002 (2002/95/EC). RoHS 2 and its amending Directives “Single Market” measures from 2012 give Member States very little flexibility around transposition. The date by which member States must transpose the amendments to the RoHS Directive is 22nd June 2019.

This is a deregulatory measure, the amendments to the RoHS 2 Directive will enable the resale and repair of old equipment and clarify issues concerning product scope. This will bring lower costs to business, whilst still maintaining a high level of environmental protection.
This RTA is to assess policy options to reduce unnecessary burden on industry from unintended side-effects of the open scope provisions of RoHS 2

2. Policy objectives and intended effects

The policy objective is to remove the anomalies highlighted above that were inadvertently included at the time of adoption of the 2011 RoHS 2 Directive. If left in existing domestic legislation, these anomalies would severely restrict

the second-hand sales of equipment that comes within the scope from July 2019, as well as the supply of spare parts and the restriction of lead in any new pipe organs. This would have a significant negative economic and environmental impact on all the impacted product categories.

The intended effects of the amendment is to remove the negative impact assessed under the RoHS 2 Directive. The exclusion from the scope of product groups with unresolvable compliance problems and negligible benefits from their inclusion into RoHS 2 scope would prevent market disruption and further promote a circular economy for the EEE sector.

3. Description of options considered

The Baseline This is the current situation, at present all product categories falling under RoHS 2 are either RoHS compliant or out of scope"

Option 1. Outlines the impact of the recast of RoHS 2 Directive (compared to the baseline). The "do nothing" option means that measures coming into force in July 2019 (under the RoHS 2 Directive) will render several currently "out of scope" equipment and devices "in scope.

Option 2. Amend the affected articles of the RoHS Recast Directive to rectify the unintended consequences that would otherwise occur under option 1. This is the preferred option as it would allow the continuation of the legally established position, at no extra cost to business.

4. Expected level of business impact

In order to estimate the expected level of business impact, it is first necessary to establish current levels of corresponding business activity as set out the evidence base and estimate what changes would occur in the absence of any change to ROHS legislation.
It was also necessary to apply assumptions for the purposes of the analysis where data did not exist. Option 1 establishes the most likely scenario in the absence of any change. The costs and benefits of the other options will be assessed in relation to this option

4.1 Impacts under the Baseline

Since this is the current business situation it is assumed that all products are currently RoHS 2 compliant and there are no cost or benefits to be quantified under this option

4.2 Impacts under Option 1

The assessment of potential impacts of RoHS 2 articles 2(2)/4(3)/4(4) and 4(5) as published in the European Commissions impact assessment (2017)[1] showed that their implications were likely to cause significant environmental, economic and social costs with no or only limited benefits.

Under this option, the implications for Category 8 (Medical devices) and Category 9 (Monitoring and control instruments) and category 11 (other EEE

[1] Amending Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Impact Assessment, European Commission 2017

including NRMM and pipe organs) placed on the market after July 2019, is that they must be RoHS compliant or this equipment cannot be sold, resold, leased or given away in the EU.

Non-compliant equipment will become waste (regardless of its economic value) if it cannot be exported for sale outside of the EU. This also means that affected equipment would need to be replaced by new devices. Consume more energy; more raw materials and create more waste than would be generated by opting for refurbished ones.[2]

4. 2.1 Economic impacts

The economic impacts were calculated in line with HM treasury's Green Book guidelines. The analysis in this assessment is in line with the analysis undertaken by the European Union RoHS 2 impact assessment. The key industry information and estimates used in this assessment are those sources used by the European Union for their impact analysis and as such, they are considered sound and reliable sources.

The total cost to business under option 1.is difficult to assess in the context of the impacts. Some of the affected product categories cover a broad range of products machinery, for which no consistent market date is available. As such it was necessary to make some assumptions around the related costs in order to give some implications of the order of magnitude of the costs burden to business under option 1. Some key assumptions are outlined below.

Key assumptions

When the relevant articles of RoHS 2 comes into force in July 2019, not all products in the respective categories will be affected. A large proportion of these products are assumed to already be RoHS compliant. Some assumptions must be made around what proportion of the respective product categories will be declared RoHS non-compliant and incur the negative impacts.

1. The UK estimate for refurbished category 8 market is derived by taking 6% of EU estimate in line with UK share of GDP in EU.
2. The UK Value of refurbished category 9 equipment per annum is assumed to be 25% of the value of total UK market of Cat 9 equipment.[3]
3. Of the total UK market for Category 8 devices – 16% of the market for category 8 devices are assumed to be currently RoHS non-compliant.
4. The proportion of RoHS 2 non-compliant refurbished Cat 9 devices 10% of total market value of refurbished Category 9 devices (best estimate)[4].

[2] Measures to be implemented and additional impact assessment with regard to scope changes pursuant to the new RoHS Directive, BIO Intelligence Study 2012 (pg. 350)
[3] Final Impact Assessment for Recast of the Restriction of Hazardous Substances (RoHS) Directive, BEIS (2012)
[4] Additional Input to the Commission Impact Assessment for a Review of the Scope Provisions of the RoHS Directive Pursuant to Article 24(1), Oeko-Institut 2014

5. The proportion of RoHS 2 non-compliant category 11 NRMM is estimated at 20% of total UK sales volume based on industry estimates.[5]
6. Euro / UK pound exchange where used was current rate, at the time spreadsheet prepared was €1.12 = £1.
7. Loss of revenue (pipe organs and resale of medical devices) is projected over the 10 year period and assumed to be constant based on the evidence provided in the EU impact assessment and supporting documents

4. 2.2 Cost to Business

The total cost to business under option 1 equated to an estimated £43m per annum and £430m (£372m in present values) over a 10 year period.

Cost of refurbished category 8 devices

The economic impacts of the RoHS 2 restrictions will affect est. 16% of the UK market for refurbished category 8 equipment.[6]

The additional cost paid for new category 8 equipment relative to refurbished equipment is assumed at 35% (industry estimate).

The additional cost of replacing RoHS2 affected category 8 equipment, with new equipment rather than refurbished is 35% x £3.5m = average £1.2m per annum.[7]

The potential loss for UK hospitals due the Article 2(2) which restricts the resale of used category 8 imaging medical equipment, is estimated to be constant at £8.1m per annum.(see section 4.2.4)

Cost of refurbished category 9 devices

These include monitoring and control devices such as in vitro devices

The economic impacts of the RoHS 2 restrictions will affect est. 10% of the UK market for refurbished category 9 equipment.

The additional cost paid for new category 9 equipment relative to refurbished equipment is assumed at 25% (industry estimate) so that the additional cost of replacing RoHS2 affected category 9 equipment, with new equipment rather than refurbished is 25% x £91m = average £22.7m per annum**.**[8]

Cost to category 11 devices

---

[5] based on industry estimates of distribution between models with an on-board power source and models without (cord-connected) of 80:20) taken from Impact Assessment amending Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment, European Commission 2017 (pg. 28)

[6] Taken from the Final Impact Assessment for Recast of the Restriction of Hazardous Substances (RoHS) Directive 2012

[7] For category 8 Bios report (2012) estimate of value of refurbished medical equipment (€200m). The UK estimate is derived by taking 6% of EU estimate in line with UK share of GDP in EU. Past UK production / sales for all medical categories was used to calculate an average annual increase of 5.7% which is used to extrapolate future production / sales data of Category 8 equipment. (RoHS2 affected cat.8 equipment estimated at 16% of UK total)

[8] The UK market for category 9 devices was £2.9bn in 2012. The value of the refurbished category 9 equipment is assumed to be as 25% of the market. Future sales growth was calculated using the average annual growth over the past ~ 10 years at 1.8%.

These include pipe organs and non-road mobile machinery (NRMM)
Due to lack of possible substitutes for pipe organs affected by the RoHS 2 restrictions, pipe organ builders, which are also mainly SMEs, would have to completely abandon their production for the UK market. This would mean the de-facto end of organ production for the UK market and therefore a loss of est. £7m turnover per annum, in addition to the loss of jobs and related income.[9]

These costs are projected over a 10 year period to reflect expected turnover levels in the absence of any information to the contrary.

Further to this, pipe organs already belong to an established closed loop system. When pipe organs reach their end of life, the pipes are either reused in their original form or melted down and transformed into new pipes.

The addition of pipe organs to the RoHS 2 scope has no additional benefit.[10]
For other products falling under category 11 such as NRMM machinery, RoHS 2 implications will affect 20% of total UK market volume.[11]
The cost will mainly be in the form of administrative costs, which will be dealt with in section 4.2.3

4.2.3 Administrative cost

The key administrative costs will be in the form of compliance and transition costs to business. Of the affected product categories, compliance cost will arise for all categories excluding pipe organs.

Attaining RoHS 2 compliance requires research, development and testing, according to industry estimates, this process can take around 12-18 months followed by further 3-4 years for the implementation in safety standards.[12] For the purpose of simplicity, it is assumed that the compliance costs will be distributed over a 10 year period.

Based on research from a range of reliable sources we have opted for the conservative estimate of 1% of turnover each year from 2019.[13]

---

[9] Additional Input to the Commission Impact Assessment for a Review of the Scope Provisions of the RoHS Directive Pursuant to Article 24(1), Oeko-Institut 2014 (pg.16)

[10] Additional Input to the Commission Impact Assessment for a Review of the Scope Provisions of the RoHS Directive Pursuant to Article 24(1), Oeko-Institut 2014 (pg.17)

[11] (based on industry estimates of distribution between models with an on-board power source and models without (cord-connected) of 80:20) taken from Impact Assessment amending Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment, European Commission 2017 (pg. 28)

[12] Study for the analysis of impacts from RoHS2 on non-road mobile machinery without an on-board power source, on windows and doors with electric functions, and on the refurbishment of medical devices Report for the European Commission 2015(pg.12)

[13] Measures to be implemented and additional impact assessment with regard to scope changes pursuant to the new RoHS Directive, Final Report European Commission 2012; Impact

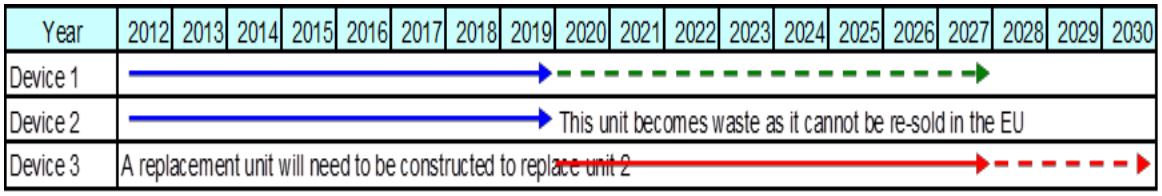
Conservative estimation of compliance cost to business RoHS2 coming into force lie at £3.7m per annum for those affected categories for which data and information was available.[14] (These costs are based on a total of £37m covering the first 4 years, whereby the costs are assumed to be distributed over a 10 year period.

4.2.4 Environmental cost

Option 1 would also lead to premature product obsolesce, causing products to enter their waste phase earlier than intended. This would lead to the creation of extra waste. Industry estimates under option 1, an extra 186t of WEEE would be generated for Category 8 and Category 9 i.e. medical devices at a waste treatment cost of £0.041m per year.[15]

According to a report by BIOIS (2012)[16] the impact of RoHS 2 can be illustrated via medical devices such as MRI or CT which are often refurbished and then sold to second users when they are approximately seven years old. Blue illustrates the average product lifespan of 7 years, followed by refurbishment and extended lifespan of an additional 7 years (green broken lines), after which it would then be sold, generating income for hospitals (see section 4.2.2).
Under option 1, these products will no longer be eligible for resale or refurbishment in the EU. So that unless a non-EU buyer can be found
The product will become waste after the first 7 years resulting in loss of resale value, higher cost of a new device and generating waste and corresponding waste treatment and disposal costs.

Figure 1 Waste generation under ROH2



Source: Bio Intelligent Services (BIOIS) 2012

4.2.5 Non monetised Impacts

Assessment amending Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment, European Commission 2017

[14] Annual sales data taken from PRODCOM volume of category 11 NMMR machinery in the last 3 years (Lawn mowers and professional cleaning machinery based on average 4 year span (1% * £218m = £2.2m); affected UK sales volume of category 8 and 9 over 4 years(1% * £3.5bn = £35m)

[15] Amending Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Impact Assessment, European Commission 2017, based on best estimate of 2018 standard WEEE treatment and disposal cost of £200t (held constant)
[16] Measures to be implemented and additional impact assessment with regard to scope changes, pursuant to the new RoHS Directive, Final Report, European Commission, DG ENV 06 July 2012

There are also non-monetised cost such as the environmental cost of increased waste production and premature product obsolescence, as well as the cost associated with social impacts such as employment; consumers' behaviour; health and wellbeing.

Health impacts related to option 1 might occur where medical products' life ends earlier than technically necessary. The loss of refurbished' medical equipment could result in negative impacts on patients' health in terms of medical equipment availability, especially in times of budgetary constraints to the public health sector

Option 1 will also have a significant negative cultural impact through the loss of the pipe organ. Pipe organs are high value, long life products that seldom last less than 25 years, most of them are between 100 and 400 years old. The extinction of the instrument has long-term implications since ageing pipe organs shall no longer be able to be replaced or restored, leading to the loss of cultural value that society extracts from this instrument.

4.3. Impacts under Option 2

Option 2 would avoid significant economic and social costs as estimated in section 4.2, and is therefore the preferred option. Under this option, the amendment of the RoHS2 Directive would rectify the unintended consequences of the current Directive.

The proposed changes are regulatory and the cost of the measure is estimated to be very low if not negligible, since these would be general administrative costs, such as documentation of compliance, which would not necessarily be affected by the distribution of compliant and non-compliant products.

As such this change is largely inconsequential in terms of cost while the benefits of this option would arise from the avoided costs of option 1. Therefore option 2 is the zero impact option.

This option would also help to meet the UKs' policy objective of the correct and regular functioning secondary market, without hampering the objective of the protection of human health and the environment.