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**COMMISSION STAFF WORKING DOCUMENT**

**Accompanying the**

**Proposal for a**

**REGULATION (EU) No .../... OF THE EUROPEAN PARLIAMENT AND OF THE  
COUNCIL**

**amending Regulation (EC) No 648/2004 as regards the use of phosphates and other  
phosphorous compounds in household laundry detergents**

**IMPACT ASSESSMENT SUMMARY**

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## 1. INTRODUCTION

Phosphates are used in detergents to reduce water hardness and allow detergents to perform efficiently. However, phosphates from detergents can adversely affect the aquatic environment and disturb the ecological balance by increasing the growth of algae, a phenomenon called eutrophication. Alternative water-softening ingredients are available but with various performance limitations, particularly for more demanding cleaning tasks.

Regulation (EC) No 648/2004 on detergents<sup>1</sup> harmonises the placing on the market of detergents with respect to the labelling of detergents and the biodegradability of the surfactants they contain. In view of concerns about eutrophication, Article 16 of the Regulation required the Commission to “*evaluate, submit a report on and, where justified, present a legislative proposal on the use of phosphates with a view to their gradual phase-out or restriction to specific applications*”. The Commission presented the report in 2007 concluding that the state of knowledge concerning the contribution of detergent phosphates to eutrophication was insufficient but developing rapidly<sup>2</sup>. Subsequent work to close the knowledge gap forms the basis for this impact assessment report, which analyses various policy options to address the use of phosphates in detergents.

## 2. PROBLEM DEFINITION

### 2.1. Why is the presence of phosphates in detergents an issue?

Phosphates in detergents contribute to eutrophication, a complex phenomenon in which elevated phosphate levels reduce the quality of surface waters. The main sources of phosphates in the environment are: fertilisers, metabolic waste from humans and livestock (urine + faeces), and detergents. The relative importance of inputs varies between Member States and water catchment areas. Although the quantity of phosphorous in detergents (110.000 t) is less than 10 % of that in fertilisers (1.5 million t), all detergent phosphates are discharged into waste water and potentially contribute to eutrophication, whereas most fertiliser phosphates remain in agricultural soils and only a minor (but not fully quantifiable) fraction is washed out or erodes with soil into surface waters. The Water Framework Directive 2000/60/EC has led to an increased focus on combating eutrophication.

A probabilistic risk assessment model (INIA 2009)<sup>3</sup> has quantified the contribution of detergent phosphorus to eutrophication risks throughout the EU as between 2.3 % in the Mediterranean to 5.8 % in the Central Baltic eco-regions. However, the results are uncertain. The Scientific Committee on Health and Environmental Risks (SCHER)<sup>4</sup> concluded that the INIA model is an innovative tool for calculations at the pan-European level although not suitable for estimating the contributions to eutrophication at regional or local level. Furthermore, SCHER could not determine whether the data which were available for the probabilistic modelling were representative of the whole EU.

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<sup>1</sup> Regulation (EC) No 648/2004 of the European Parliament and of the Council on detergents, OJ L104, 8.04.2004, p. 1.

<sup>2</sup> (COM (2007) 234), available at:  
[http://ec.europa.eu/enterprise/chemicals/legislation/detergents/index\\_en.htm](http://ec.europa.eu/enterprise/chemicals/legislation/detergents/index_en.htm)

<sup>3</sup> Available at: [http://ec.europa.eu/enterprise/chemicals/legislation/detergents/index\\_en.htm](http://ec.europa.eu/enterprise/chemicals/legislation/detergents/index_en.htm)

<sup>4</sup> Available at [http://ec.europa.eu/health/ph\\_risk/committees/04\\_scher/docs/scher\\_o\\_116.pdf](http://ec.europa.eu/health/ph_risk/committees/04_scher/docs/scher_o_116.pdf)

Deterministic calculations for the Danube River Basin (DRB)<sup>5</sup> show that the replacement of phosphates in detergents can result in a reduction of 24 % phosphorus (P) from point sources<sup>6</sup> and in a reduction of 12 % from all sources.

Both probabilistic and deterministic modelling thus agree that phosphates in detergents do contribute to some extent to eutrophication risks, but cannot fully quantify this. For some sensitive regions, the contribution of detergent phosphates to eutrophication has been reliably quantified and found significant. The use of phosphates in detergents therefore results in a negative externality (eutrophication) the costs of which are born by society in general, rather than by detergent formulators, who have no economic incentive to design detergents that reduce eutrophication risks.

## **2.2. Costs for phosphate removal in waste water treatment**

Sewage treatment plants with tertiary treatment can remove phosphates from waste water. However, only a part of the EU population is connected to municipal sewage treatment plants and not all existing plants are equipped with tertiary treatment. Most phosphate removal processes rely on chemical precipitation with iron salts which entails capital costs (for installing tertiary treatment) and operational costs, which depend on the quantity of phosphates eliminated.

The annual operating costs for removing detergent phosphates from waste water have been estimated to be 10 million to 693 million €<sup>7</sup>.

## **2.3. Fragmentation of the internal market and the impact of mutual recognition**

In the absence of EU legislation, some Member States have taken national measures restricting the use of phosphates in detergents. Others have relied on voluntary action by industry to replace phosphates. This has led to a reduction in the use of phosphates from about 250 000 t in the mid 1980s to about 110 000 t now. Phosphates in detergents are still unrestricted in ten Member States. Consequently, the internal market for detergents is fragmented regarding their phosphate content, and detergent producers are faced with divergent rules.

Regulation (EC) No 764/2008 on mutual recognition<sup>8</sup> requires Member States to accept any products (including detergents containing phosphates) that are lawfully placed on the market of another Member State unless they can demonstrate specific reasons to the contrary. Member States have only 20 working days (or 40 days in complex cases) to respond to

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<sup>5</sup> Harmonised Inventory of Point and Diffuse Emissions of Nitrogen and Phosphorus for a Transboundary River Basin (available at: <http://www.icpdr.org/icpdr-pages/phosphorus.htm>).

<sup>6</sup> Point sources of phosphorus involve detergents, human metabolism and industry, but not fertilisers.

<sup>7</sup> Figures used were from: DEFRA, UK, 2008:

<http://www.defra.gov.uk/environment/quality/water/waterquality/diffuse/non-agri/documents/consultation2008-detergents.pdf>;

A.O. Tanyi. Comparison of chemical and biological phosphorus removal in waste water – a modelling approach.

EUREAU in 2010: Sweden 1-5 €/kg P, Hungary 7 €/kg P, Belgium 4,2 – 5 €/kg P (including sludge disposal)

<sup>8</sup> Regulation (EC) No 764/2008 of the European Parliament and of the Council of 9 July 2008 laying down procedures relating to the application of certain national technical rules to products lawfully marketed in another Member States and repealing Decision No 3052/95/EC. OJ L 218, 13.08.2008, p. 21.

manufacturers applying for mutual recognition. Member State administrations might be overwhelmed if many products lawfully placed on the market in other Member States, but with different phosphates content, were to be placed on their markets in a short period of time.

#### **2.4. Who is affected, how and to what extent by the current situation?**

- Detergent formulators in the EU, without a harmonised market for phosphates in detergents, have to comply with different rules in the Member States and face extra costs. Imports of detergents into the EU are insignificant.
- National public administrations in Member States having established legislation on phosphates in detergents to combat eutrophication might have increasing difficulties to enforce their legislation under their obligations on mutual recognition.
- Waste water treatment plant (WWTP) operators with tertiary treatment face costs for removal of detergent phosphates from waste water.
- Phosphates from detergents contribute to eutrophication in several EU regions, which creates adverse effects in the environment and can lead to negative economic consequences for fishery and tourism industries. Neighbouring regions sharing surface waters with the EU also suffer from phosphate outflows from the EU.

### **3. ANALYSIS OF SUBSIDIARITY**

Although eutrophication can be a local or regional problem most river basins in the EU extend across national borders. In particular, larger river basins (e.g. the Danube) and marine water bodies (e.g. the Baltic Sea) receive inflows from many different Member States. Experience shows that regional cooperation is not fully effective to reduce eutrophication at regional level. Furthermore, diverging national rules hinder the free movement of goods. Action at EU level is the only way to ensure the free movement of goods while effectively addressing eutrophication at regional level. The Member States support EU action based on Article 114 TFEU.

### **4. OBJECTIVES OF THE INITIATIVE**

#### **4.1. General Objective**

The general objective is to ensure a high level of protection of the environment from potential adverse effects of phosphates in detergents and to safeguard the internal market for detergents.

#### **4.2. Specific objectives**

- To reduce the adverse environmental effects from eutrophication in surface waters, in particular due to the cross-boundary flow of waters containing phosphates from detergents.
- To reduce phosphate discharges into surface waters in a cost-effective manner.
- To improve the free movement of detergents in the internal market by harmonising divergent national rules concerning their phosphate content.

- To avoid possible burdens for public administrations for developing and justifying national measures in the absence of harmonised EU measures.

## **5. POLICY OPTIONS**

### **5.1. Option-1: No action at EU level (baseline option)**

Member States would maintain existing restrictions on phosphates in detergents, or introduce new ones.

### **5.2. Option-2: Voluntary action by industry**

Detergents formulators would commit voluntarily to replace STPP by alternatives.

### **5.3. Option-3: Total ban of phosphates in all detergents**

Phosphates would be banned in all types of detergents.

### **5.4. Option-4: Restriction of phosphates in laundry detergents**

Phosphates would be restricted only in laundry detergents and not in dishwasher (ADW) detergents or in Industrial and Institutional (I&I) detergents.

### **5.5. Option-5: Setting limit values for the content of phosphates in detergents**

The content of phosphates in various types of detergent would be limited to certain concentration levels.

## **6. ASSESSMENTS OF THE IMPACTS**

### **6.1. Option 1: No action at EU level, leaving the responsibility to act to the Member States (baseline option)**

Eutrophication at local level could be tackled appropriately without EU action. However, this is different at regional level, where even co-ordinated action of several Member States has not been fully effective. Member States co-operating in the Baltic Sea Strategy and the Danube River Basin have called for EU action. This option would not improve the functioning of the Internal Market, nor would it avoid burdens to administrations and industry linked to mutual recognition. In the light of current market trends, eutrophication risks from detergents may be expected to decline, albeit slowly. Costs for phosphate removal from wastewater are expected to peak at around 2015 due to higher connection rates to WWTP (in particular in EU 12) and will then slowly decline in line with market trends for phosphates use.

### **6.2. Option 2: Voluntary action by industry**

A voluntary commitment at EU level could in theory achieve the intended objectives. However, A.I.S.E., the European detergent formulators association which represents 90 % of the market, is unwilling to make such a commitment.

### **6.3. Option 3: Total ban of phosphates in all detergent products**

A total ban of phosphates in detergents would be most effective for reducing eutrophication risks at EU level. It is not feasible to quantify or monetise the benefits, which would slowly decline in line with market trends for phosphates use.

The option would reduce operating costs for WWTP by 10 to 693 million € per year. Over time, avoided costs would initially increase and peak at around 2015 in line with higher connection rates to WWTP and then slowly decline in line with market trends for phosphates use. Total reformulation costs for detergent manufacturers (one-off) would be 20-142 million €. Net benefits would thus accrue within 1 to 2 years. However, there are currently no technically feasible alternatives for I&I products, while issues of technical performance have not been completely resolved for ADW products. This would lead to significant additional costs for research and innovation - particular concerns were expressed by SMEs formulators. Consumers and professional users would face problems from less performing detergents.

Phosphates producers would face plant closures and 3 000-5 000 job losses, which might only be partially offset by gains for alternatives producers.

No risks to human health or the environment have been identified for the alternatives to phosphates, but some uncertainties remain concerning phosphonates, polycarboxylates and EDTA due to incomplete data.

This option would fully harmonise the internal market in detergents, thus eliminating any additional costs for industry and administrations due to the current fragmentation and avoid burdens from the requirement for mutual recognition.

### **6.4. Option 4: Restriction of phosphates in laundry detergents**

Restriction of phosphates in laundry detergents would be less effective in reducing eutrophication than Option 3 (60 % of phosphates are used in laundry detergents). However, the difference cannot be quantified or monetised.

Reduced operational costs for WWTP are estimated at 6 million to 415 million € annually, with the same trends over time as described in Option 3. Total reformulation costs (one-off) for laundry detergent formulators are estimated at about 13 million €. Net benefits would thus accrue within 1 to 3 years.

There would not be any problems with regard to technical or economic feasibility of alternatives and no performance problems for consumers and professional users. Phosphate producers estimate job losses of ~1 000-1 650, which would probably not be fully offset by gains for producers of alternatives.

This option would ensure a fully harmonised internal market for laundry detergents, but not for ADW or I&I detergents. So far only two Member States (Sweden, France) plan to restrict phosphates in I&I and ADW products in the near future.

Option 4 was preferred by 14 Member States at the November 2009 meeting of the Detergents Working Group. This option is closest to the majority of existing national rules which, however, do not totally ban phosphorus, but impose limits in the range of 0.2 to 0.5 %. Therefore, a limit value at EU level would have to be selected in further consultations with the Member States.

## 6.5. Option 5: Setting limit values for the content of phosphates in all detergents

This policy option could be effective in reducing the eutrophication risk by setting different limits for laundry, ADW and I&I detergents. However, it would not be easy to agree on limits for ADW and even more so for I&I detergents due to the diversity of technical requirements (many I&I detergents are formulated specifically for each customer's industrial plant). Imposing any given limit value would be expected to trigger multiple requests for derogation under Article 114 TFEU with related administrative burdens for national administration and the Commission.

## 7. COMPARISON OF THE OPTIONS

OPTION	Effectiveness	Efficiency	Environmental-Impacts	Costs/benefits
<b><i>Option-1:</i></b> <b><i>No action at EU level (baseline option)</i></b>	(0)Current trends continue	(0)No change	(0) Slowly decreasing eutrophication risks	(0) Costs for P removal remain at 10 m - 693 m €annually, peaking in 2015 then slowly decreasing
<b><i>Option-2:</i></b> <b><i>Voluntary action</i></b>	(+) Could be effective.	(-) Industry unwilling to cooperate.	(+) Reduction of eutrophication risks	(-) Significant burden for industry to monitor
<b><i>Option-3:</i></b> <b><i>Total ban of phosphates in detergents</i></b>	(++) Would eliminate 100 % of phosphates in detergents.	(++) Full harmonisation of the Internal Market through a single EU action.	(++) Greatest and fastest reduction of eutrophication risks.	(--) Reformulation costs for SMEs between €20 m – €142 m (one-off). Savings in WWTP 10 m to 693 m € annually. Net benefits in 1 to 2 years, but no alternatives for ADW and I&I detergents – adverse effects on users. 3000-5000 jobs lost.
<b><i>Option-4:</i></b> <b><i>Restriction of phosphates in laundry detergents</i></b>	(+) Would eliminate 60 % of phosphates in detergents.	(+) Fully harmonised internal market for laundry detergents only.	(+) Significant and fast reduction of eutrophication risks.	(++) Reformulation costs for SMEs ~ 13 m € Savings in WWTP 6 m to 415 m € annually. Net benefits in 1 to 3 years. Alternatives available. 1 000-1 650 jobs lost.
<b><i>Option-5: Limit values for the content of phosphates in detergents</i></b>	(+) Between Options 3 and 4.	(-) Difficult to agree on limits for I&I and ADW detergents.	(+) Between Options 3 and 4.	(-) Effects on operators and users between Options 3 and 4.  Burdens from derogation requests under Article 114 TFEU.

Option 4 appears to be best. It would reduce the eutrophication risk from the cross-boundary flow of detergent phosphates more efficiently than Member States can do alone.



The measure would be proportionate as technically and economically feasible alternatives for phosphates in laundry detergents are available. Detergent formulators would need to spend about 13 million € on reformulation as a one-off cost which would be largely offset within 1 to 3 years by reduced P removal costs in WWTP in the order of 6 to 415 million € per year. Removal of phosphates from laundry detergents is more cost-efficient for nutrient elimination than waste water treatment. Compared to Option 3 there are no problems in finding well-performing alternatives and hence no negative effects on detergents users.

Negative impacts would be on phosphate producers who would lose part of their market with closure of some plants and job losses of 1 000-1 650. However, use of phosphates in detergents has already declined significantly in the past and phosphate producers would have to adapt to this trend in any case.

The option would ensure a harmonised internal market for laundry detergents. The majority of Member States prefer this option.

There would be no impact on the EU budget and no significant administrative burdens for enterprises.

## **8. MONITORING AND EVALUATION**

Monitoring mechanisms established under the Detergents Regulation or the REACH Regulation can be used and monitoring the content of phosphates in detergents would constitute only a marginal addition to existing obligations. Eutrophication is already monitored under the Water Framework Directive.