



To:

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JRC: Silvia Bobba, Samuel Carrera, Jaco Huisman, Fabrice Mathieux, Claudiu Pavel

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**Object : Phosphate Rock and Phosphorus as Critical Raw Materials,
as taken into account in:**

JRC “Critical Raw Materials for Strategic Technologies and Sectors in the EU – A Foresight Study”, 2020, ISBN 978-92-76-15336-8

European Commission Communication COM(2020) 474 final, 3rd September 2020 “Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability”

Dear DG GROW, dear JRC,

We note the publication of the Commission communication presenting the 4th version of the EU Critical Raw Materials List and the accompanying “Foresight Study” on Critical Raw Materials for strategic sectors/technologies.

We note that the criticality of Phosphate Rock and Phosphorus does not seem to be appropriately represented in these two documents (in Annex 2 of the Commission communication and in the content and overall conclusions of the Foresight Study).

As you know, we have been working closely with JRC and GROW to improve understanding of the criticality of “Phosphorus” (P4/white phosphorus and its derivatives), in particular with the webinar co-organised with industry and with selected experts on 9th July and are aware that much of the information developed in this process may have been “too late” to be taken into account. However, we think it nonetheless useful to indicate a number of omissions identified in these two documents.

In the table Annex 2 of COM(2020) 474 final

Phosphate Rock and Phosphorus are indicated as relevant to “Energy-intensive industries” and “Agri-food” only.

- Agri-food is correct for Phosphate Rock but not for Phosphorus.
P4/derivatives are not used in fertiliser or animal feed, and can be replaced by “wet-route” phosphoric acid, after purification, in food additives.
- Energy-intensive industries does not seem particularly relevant for Phosphate Rock, but is correct for phosphorus (P4-derivatives are used in oil drilling, lubricants catalysts for petrochemical refining, water cooling systems).
- We suggest, however, that the following should be ‘ticked’ in this table as sectors where Phosphate Rock and/or Phosphorus are critical:

- Phosphate rock -> *Renewable energy, Mobility/automotive* – phosphorus compounds in electrolytes and cathodes of batteries, phosphoric acid in fuel cells

- Phosphorus -> critical for non-halogenated flame retardants, without which use of plastics and compounds would be untenable because of fire risks in: *Aerospace/defence, Electronics, Mobility/automotive, Renewable energy, Textiles, Construction products*



- Phosphorus -> critical for Cobalt production, and so for the sectors where Cobalt is identified as critical: *Aerospace/defence, Textiles, Electronics, Mobility/automotive, Energy-intensive industries, Renewable energy, Digital*

- Phosphorus -> lubricants, so critical for *Mobility/automobile*

The identification of technologies concerned by Phosphorus in fig.64 page 81 and the identified use of phosphoric acid on page 24 of the Foresight Study in any case implies that in Annex 2 Phosphate Rock should be ticked for *Renewable energy* and for *Mobility/automotive* and Phosphorus should be ticked for *Aerospace/defence, Electronics, Mobility/automotive, Renewable energy, Digital*.

In the Foresight Study

We are surprised and regret that the Critical Raw Materials “Phosphorus” (in effect P4 and its derivatives) and “Phosphate Rock” (phosphorus in any form: phosphate rock, phosphoric acid, fertilisers, other chemicals, phosphorus in organic materials) are almost totally absent, and appear to be not considered in this study.

In particular, in the Sankey diagram on the study cover (which resumes the overall study conclusions for 24 materials) “Phosphate Rock” and “Phosphorus” are both absent.

This is surprising, given that Phosphate Rock and Phosphorus are on the 2017 (3rd) and 2020 updated (4th) EU Critical Raw Materials Lists, with EU import dependencies in the 2020 list identified respectively as 84% and 100%.

- On page 81 (fig. 64) of the Foresight Study, Phosphorus is cited as one of eight orange/red materials, and is identified used in *Batteries, Robotics, Drones, Digital technologies*.
 - We do not understand why this identification of importance is then apparently ignored in the rest of the Foresight Study text and analysis (Phosphate Rock and Phosphorus are mentioned in only one other place in the whole report = page 24, other than being cited in the EU CRM list = page 44)
 - We do not understand why this identification of importance is not represented in the Sankey diagram on the Foresight Study cover, which ‘summarises’ the study overall conclusions
- We would suggest (for the same reasons as indicated above concerning Annex 2 for COM(2020) 474 final), that in the table fig. 64, page 81 of the Foresight Study:
 - Phosphate Rock should be included as critical for *Fuel cells, Batteries*
 - Phosphorus should be included (in addition to columns already ticked) for *Wind energy, Photovoltaics and 3D-Printing* (because P4/derivatives are essential for fire safety in plastics and composites)

More complete information on uses and applications of “Phosphorus” (P4/derivatives) in the summary document of the joint JRC / GROW / ESPP webinar of 7th July 2020, of which we are sending a finalised draft accompanying this letter. We hope that you will be able to validate this document for publication by ESPP.

We hope that this input will be useful to you and are at your disposal for any questions or clarifications you may have.

Ludwig Herman, President ESPP