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To the European Commission, DG GROW – Critical Raw Materials GROW-CRM@ec.europa.eu copy contact@scrreen.eu

Object: Critical Raw Materials assessment and SCRREEN2

2nd July 2022

Dear DG GROW,

We cannot find any contact name on the invitation or agenda for the SCREEN2 workshop of 1st June 2022. We are therefore sending this email to the DG GROW functional email so that you can forward to the appropriate persons.

Please could you send to us the names and emails of the persons in the SCRREEN2 project responsible for the work on "phosphate rock", "phosphorus" and "potassium".

Also, we have not received (unless we are mistaken) the summary / conclusions of the October 2021 first SCRREEN2 workshop. The second workshop did not start, for each material, by validating the conclusions from the first workshop, as would be expected.

The absence of a clear summary of conclusions of the first workshop, circulated to and validated by participants, contributed in our view to the second workshop in June seeming to be moving in circles without progress on questions already raised last year.

Please could you be so kind as to send us summary and conclusions of the first workshop, and also the list of participating experts, and when ready also of the second workshop.

We also cannot find any relevant information on the SCRREEN website (contacts for each CRM, information from workshops, list of experts having participated at each workshop). For an EU-funded process intended to support a Commission Delegated Act (update of the CRM List), the process is opaque.

Following now two online SCRREEN2 workshops on phosphate rock, phosphorus and potassium on 1st June, we wish to clarify in writing the comments we already made at these workshops, as below.

We hope that this will enable to now progress the outstanding issues of approach to assessment of the CRMs "phosphorus", "phosphate rock" and for "potash", and we remain at your disposal if you have questions.

Yours faithfully

Ludwig Hermann, President



For the CRM "Phosphorus"

We underline that the analysis should consider not only phosphorus in the form of "P₄" ("white" or "yellow" phosphorus) but also the derivates which are used as vectors for P₄.

 P_4 is critical because it is not feasible to produce many organophosphorus chemicals from phosphate rock via phosphoric acid. As we already indicated in the October 2021 SCRREEN2 workshop, and reminded in our email of 24/12/2021, this is detailed in SCOPE Newsletter n°136 (this document was validated by JRC and DG GROW) and in the JRC MSA for P_4 published in July 2021. However, a significant part of the phosphorus coming from P_4 (and so, the a significant part of the final use of P_4) comes into the EU not as P_4 (which is problematic to transport and handle) but as P_4 -derivates (intermediate 'vector' chemicals). These are listed and detailed in the referenced document. SCOPE Newsletter P_4 0.

The assessment of quantities of the CRM "Phosphorus" imported into and used in the EU should therefore include both P₄ and also these identified P₄-derivates.

As explained in these documents, in addition to being essential for production of a range of organophosphorus chemicals, P_4 is also essential for the production of very pure phosphoric acid required for certain specific applications. A key question in assessing the criticality of P_4 , because it significantly impacts both the final dependent uses and the total quantities, is which applications of phosphoric acid can be supplied by purified "wet route" phosphoric acid, as opposed to "thermal" (P_4 -derived) phosphoric acidThis question mainly concerns two applications:

- "food" grade and similar, that is use in production of food additives, including phosphoric acid used in beverages, toothpaste, metal treatment. As concluded in SCOPE Newsletter n°136 referenced above "Technically, ... this could be replaced by 'wet acid' phosphoric acid, after purification by solvent extraction".
- "batteries". Again, this is discussed in detail in SCOPE Newsletter n°136. It is necessary to distinguish between the electrolyte (lithium hexafluorophosphate, LiPF₆ used in lithium ion batteries), lithium ion phosphate used in LIFP batteries, and other uses of phosphorus chemicals in batteries (e.g. phosphorus flame retardants).

For the CRM "Phosphate Rock"

This CRM effectively means the element phosphorus in whatever form, whenever it can be used as in input material for food production or for industry (phosphate rock, phosphoric acid, phosphate fertiliser, organic fertilising materials such as manure or sewage sludge, foods, animal feeds ...).

Most phosphorus is not imported into the EU as phosphate rock but as phosphoric acid, mineral fertiliser, in animal feed, in foods (crops, milk, meat), etc.

For example, to produce chicken meat for human consumption, phosphorus input to the chicken is necessary (like all life, without daily phosphorus input in diet the chicken would die). This required input of phosphorus can be supplied by import of phosphate rock (processed in the EU to mineral phosphate feed additives), by import of phosphate fertiliser (used in the EU to grow crops fed to the chicken), by the import of feedstuffs (maize, soya ...) which contain phosphorus, or by recycling chicken manure back to the field to supply phosphorus to grow crops to feed the chicken ...



This is explained, with data and references, in ESPP's briefing note to the European Commission on "Phosphorus as a critical raw material" of 15th January 2015 (public online at www.phosphorusplatform.eu/regulatory). [Please note that the information on P₄ in this Briefing Note is now superseded by the JRC-COM validated sources cited above.]

The key data on phosphorus flows in Europe is in Van Dijk et al. 2013, summarised in <u>SCOPE Newsletter n°117</u>. To our knowledge, no comprehensive update of this is available. However, considerably updated numbers are available for most of the flows in the study (from the same statistical sources as used by the authors).

Further relevant data is in Lun et al. summarised in <u>ESPP eNews n°58</u> which shows for example that, globally, phosphorus in traded crops and livestock products is around 15% of total phosphorus mined in phosphate rock.

See also Nesme et al. (two papers) summarised in <u>SCOPE Newsletter n°128</u> and global fertiliser trade map in <u>SCOPE Newsletter n°095</u>.

The "17%" recycling rate

The number "17%" for recycling rate of phosphate rock first appeared, it seems, as "End-of-life recycling input rate - EOL-RIR" in Excel files produced by Deloitte in 2016. To our understanding at the time, this was based on the Deloitte 19/11/2015 report for EU COM "Study on Data for a Raw Material System Analysis: Roadmap and Test of the Fully Operational MSA for Raw Materials Final Report" which (summarised in <u>SCOPE Newsletter n°119</u>). This Deloitte report used the same standardised methodology for all CRMs, and ESPP commented at the time that this standard methodology may not be appropriate for the biogenic flows of phosphorus (see our comments of 22/9/2015 online at www.phosphorusplatform.eu/regulatory). ESPP identified at the time (see SCOPE Newsletter 119 cited above) important doubts about the overall approach, the data sources, the methodology and the numbers used.

This number of 17% number seems to self-perpetuate, without apparently reassessment of the methodology nor update of the input data.

For the CRM "Potash"

The comments above regarding Phosphate Rock (in whatever form, flows in minerals, chemicals, crops, foods, feedstuffs ...) apply equally to Potash.

We note that it is incoherent that the "recycling rate" for Phosphate Rock is stated to be 17% and that for Potash 0%. The rates will not be identical because of (e.g.) different non-agriculture uses for K and for P (but these are marginal for both) and possibly a different balance between use in fertiliser and in animal feed, and different agronomic behaviour (soil losses vs. crop uptake / nutrient use efficiency) but they should be of the same order of magnitude in that the general biogenic cycle is largely the same (agriculture and food system, sewage, manure ...).