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ESPP input on the proposed CMC-WW

for EU Fertilising Products Regulation

To: JRC, DG GROW - 7th May 2021

Context:

Preliminary remarks:

ESPP **welcomes very positively the CMC-WW proposal**, as a new and appropriate approach to important outstanding questions regarding circular valorisation of secondary materials, enabling responsive integration into the Fertilisers Product Regulation of appropriate secondary materials, and so promoting innovation in nutrient and resource recycling, whilst ensuring safety and quality.

However, this effectively 'completely new' proposal was first presented at the Fertilisers Expert Group of 18-19 March, whereas for the other work on by-products presented by JRC (positive list of specific materials) dialogue and information collection has been underway for a year now.

We believe that **the CMC-WW proposal is important, but not simple**, with a number of important questions remaining open, and that this proposal merits and necessitates more time for consideration.

We are well aware that this input is past the 30th March deadline. Furthermore, this input does not represent a finalised position, but rather a summary of what we would suggest are important questions for consideration for CMC-WW, as identified in exchanges with ESPP's members and network to date, and subject to be possibly completed or adjusted.

ESPP **suggests that the calendars for implementation of CMC-11 "By-Products" and CMC-WW be separated,** so that the positive list of CMC-11 which is now under discussion for some time and is well progressed, should not be delayed and can be adopted as planned, and CMC-WW progressed later with maybe an objective of technical finalisation by mid 2022 but adoption maybe 6-9 months later. The principle of CMC-WW could be already included in CMC-11 in order to "fix the goalposts".

ESPP would prefer to move faster on CMC-WW, but it does not seem appropriate to try to do so, without full consultation and consideration of this important new proposal, how it would work in practice and how certain aspects should be defined.

FOR MEMORY: context and CMC-WW proposal, as understood by ESPP:

Art. 42(7) of the FPR requires the Commission to adopt a delegated act for CMC11 By-Products by 16 July 2022 latest.

At the EU Fertilisers Experts Group, 19/3/21, the European Commission proposed to proceed on 'by-products' as follows:

- Under CMC11, include a limited number of specified materials, which are considered as "By-Products" in the Member State of production, defining - for each one - strict criteria on production process, composition, contaminants
- Create a new "CMC-WW" to cover "selected materials of high-purity that (i) show a high-added value for EU agriculture, (ii) are produced through a variety of manufacturing pathways, but (iii) may have a different legal status in different EU Member States due to diverging interpretations of the Waste Framework Directive"

COM further proposed to specify CMC-WW as

- "Materials of high purity produced as an integral part of (i) a production process; or (ii) gas purification or emission control systems, based on negative list of contaminants. e.g. pure ammonium sulphate from chemical industries and stripping/scrubbing processes, sulphur from biogas purification, gypsum from flue-gas desulphurisation),
- AND subject to trade at EU level due to high value to material volume ratio, and geographically concentrated production sites
- AND REACH registered".
- Including "By-products without reference to production process & materials derived from certain non-hazardous waste materials (e.g. biowaste, sewage) as long as high quality standards are met"

COM noted that the FPR would give End-of-Waste status to waste derived materials above, if incorporated into an EU Fertilising Product (PFC, Conformity Assessment, etc).

CMC11 would be a "positive list" approach (limitative list of specified by-products, with criteria for each one) whereas CMC-WW would be an open approach (any by-product corresponding to the general process, quality, contaminant etc criteria).

ESPP proposals and questions

ESPP welcomes very positively the principles of CMC-WW as presented, with some questions and details as below, **in particular subject to extending to "*and derivates*".**

CMC-WW would represent a major progress in enabling the Circular Economy for nutrients by facilitating use of by-products, with an EU approach (with safety and quality ensured by the CE-Mark) enabling to resolve difficulties currently posed by varying classifications of the same material from the same process sometimes as products, sometimes as by-products and sometimes as waste.

Derivates

We suggest that it is important to extent CMC-WW to "and derivates", in the same way as is done from ash and precipitated phosphates in the STRUBIAS criteria.

- If "and derivates" were added, this would resolve the outstanding problem of a material (e.g. spent sulphuric acid) which in one Member State (MS) is classed as a "by-product", so can be used as a precursor in production of a CMC1 material, but in another MS is classed as "waste", so cannot.
- If "and derivates" is NOT added, then incoherence would occur: this spent sulphuric acid (with waste status) could be included directly into a CE-Mark product (as CMC-WW, e.g. as a sulphur source) but if reacted with phosphate rock to produce e.g. single super phosphate, the resulting single super phosphate would not be eligible under any CMC.
- If "and derivates" is not added, then the application of CMC-WW will be limited to some specific materials which are used directly as fertilisers. In that we have only a short list of such materials despite our requests to stakeholders, it might make more sense to assess these materials under the 'positive list' approach already underway for CMC11 "By Products" rather than adding the new open tool of CMC-WW.

Contaminants and derivates:

- In the example of the spent acid above, when used to produce a mineral phosphate fertiliser, the process will ensure that contaminants are reduced. **The contaminant limits should therefore generally apply to the derivate** and not to the spent acid. We note that this is already the case in the proposed STRUBIAS criteria, e.g. pathogen limits are applicable to the "*Fertilising Product containing or consisting of precipitated phosphate salts … and/or derivates from such precipitated phosphate salts*". Some specific contaminants may however be limited at the initial material stage (not at the derivate stage), as is the case for dioxins (limited in the ash, not in the derivates, in the STRUBIAS criteria Thermal Oxidation Materials and Derivates, in order to prevent dioxins entering the production chain in the first place).

Dealing with different waste / by-product status in MS

It should be clarified how different waste status in different MS will be managed. The Waste Framework Directive Article 5(1d) defines when a material is a by-product, but interpretation is currently subject to subsidiarity.

This clarification could be partly made in the text of CMC-WW and be then detailed in FAQ, with examples.

- For example, one MS may classify struvite precipitated from sewage sludge digestate as a "by-product" whereas another MS may classify struvite from the same process and same input materials (inputs to the digester) as "waste".
  - Would then the struvite in the second MS be eligible as CMC-WW (subject to achieving the quality, contaminant, etc. criteria of CMC-WW) even if that struvite is classified as a "waste" in the MS in which it is produced?
  - It should also be clarified what is the status of this struvite (classified at its site of production as "waste") during transport (including into another MS) for processing under CMC-WW into a CE-Mark fertiliser.

Question: Organic-based secondary materials

Should CMC-WW allow organic or organic-containing materials?

- Limitation of organic carbon to a low level (could be the 1% specified for "mineral" fertilisers in the FRP?) would limit (but not exclude) organic contaminants and pathogens, but would exclude most by-products derived from crops or plants, agro-food industry, bio-waste or sewage processing.
- Specifying a % C-org limit would also exclude some petro-chemical by-products (no risk of contamination with pathogens, consumer or agricultural chemicals, etc), such as waxes, which have use as fertiliser additives.
- This could be different for "gas derived" materials and for other CMC-WW materials, in that the risk and levels of transfer of organic contaminants and pathogens in gases is lower than in solid or liquid by-products.

In particular, should CMC-WW allow materials derived from manure or other animal by-products?

Definition of a "production process"

A question is how to define a "by-product" from a "production process"? (taking into account the texts of the Waste Framework Directive).

- In particular, are by-products of waste disposal processes also included?
  - For example, if microalgae cultivation is used as tertiary treatment of wastewater (removing nutrients, organics, micropollutants) can the cultivated algae (harvested, dried) be considered as a by-product (subject to respecting contaminant criteria, etc, as defined in CMC-WW)?
  - For example, if potassium salts are recovered from treatment of municipal solid waste incineration ash, can these salts be considered as a by-product under CMC-WW?

REACH registration:

For coherence, we assume with the same exemptions as in CMC1 and elsewhere (note some missing exemptions are under discussion elsewhere).

Avoiding unnecessary testing

We recognise the need for a "long" list of contaminants with "low" limits in order to guarantee safety in that CMC-WW would be open to a wide range of input materials from different industries and processes. This would maybe also include pathogen limits if processes treating organic materials (e.g. sewage sludge, food waste) are eligible as sources of CMC-WW by-Products.

However, as we indicated during the Fertilisers Expert Group meeting, **we request to specify that a contaminant does not need to be tested if it can be documented that there is no reason to expect to find this contaminant in the by-product material** (other than at background levels resulting from e.g. atmospheric deposition during storage, presence in groundwater used in processing, or similar) – **as is already specified in the FPR Annex I, part II, art. 4**.

- For example, it makes no sense to analyse for PFAS/PFOS in phosphogypsum from phosphate rock processing, nor mercury in ammonia salts from manure processing. We note that trace contamination of PFAS/PFOS might get into such phosphogypsum, by erosion of 'Teflon' surfaced mechanical parts in the processing equipment, but this is (a) marginal and (b) no different than for manufacture of other materials, such a ground phosphate rock (CMC1) or ground plant parts (CMC2).

Potential for significant trade on the internal market

We understand that CMC-WW must be coherent with art. 42.1.a (expressed as "*subject to trade at EU level*" in the JRC slides 19/3/21). However:

- Art. 42.1.a indicates "*potential*" of significant trade. This is important. Materials should be eligible if susceptible to significant trade tomorrow, even if trade is limited today (this may be because … they are not today authorised in fertilising products!)
- We suggest that the trade should concern not only the by-product material but also "derivates" and also CE-Mark fertilisers produced using these as CMCs. A material may be recycled locally (i.e. without significant international trade), in significant quantities, to produce CE-Mark fertilisers (which are themselves subject to trade on the internal market).

Definition of "high purity"

The term "*materials of high purity*". should be clarified. We suggest that it is not appropriate as written.

- A material with significant levels of an impurity can be a valuable and safe CMC, on condition that the impurity is inert or even has some agronomic value (e.g. REACH dossiers for inorganic phosphate salts generally accept up to 20% of similar phosphate salts or inert materials such as sulphates, which do not modify the tox/ecotox properties of the substance).
- We suggest to specify "*safety*" rather than "*purity*"
- We suggest that this should be defined by (a) respect of the CMC-WW contaminant criteria and (b) exclusion of certain materials as inputs to the production process from which the CMC-WW is derived (e.g. nuclear industry, hospital wastes, ABP Cat1, hazardous wastes …)

Proposed candidate materials for CMC-WW

The materials indicated below have been suggested by different companies as possible candidate materials for CMC-WW. ESPP does not here take position as to the agronomic value or potential market of these materials, but each of these seems an interesting candidate for CMC-WW. We provide these examples, as received, as examples for consideration, and because real examples may help to clarify the scope, objectives and wording of CMC-WW.

We underline that some of these materials will only be relevant if CMC-WW is widened to include "and derivates" in that these materials are not used directly in fertilising products, but are used as precursors in reactions to produce fertilising products.

- **Materials from gas cleaning**:
  Further information in table below
  - Ammonium nitrate from ammonia gas stripping in sewage treatment, used since several years in fertilizers
  - Ammonium sulphate from digestates: recovery of ammonium sulphate by ammonia stripping applied to the digestate and absorption in sulfuric acid. This process is a very common process on in particular agricultural biogas plants to recover N from digestate.
  - Ammonium carbonate, from gas cleaning from ammonium carbonate feed grade production
  - Elementary sulphur from biogas: recovery of elementary sulphur from produced biogas by separating gaseous H2S and neutralization in an aqueous stream.
- **Elementary sulphur** from oil and gas refining: common petrochemical industry by-product
- **Potassium nitrate from digestate**: Recovering of potassium nitrate by nitrification, separation and up-concentration of liquid biogas plant digestate.
- **Potassium chloride** from coal incineration fly ash gypsum mixtures: recovery by extraction from drainage water and upgrading.
- **Waxes originating from petrochemical industry**, which have potential to be used as technical additives in fertilisers.
- **Spent acids**
  Further information in table below
- **Nitrous oxide from adipic acid production**
- **Ammonium salts from powder fire extinguisher refurbishment**
  Further information in table below
- **Cu and Zn process** streams
- **Spent potassium hydroxide** after use in food industry or other industries
- **Mineral salts recovered from waste incinerator ashes**
  Further information in table below

We also attach more detailed information on some other "proposed candidates for CMC-WW" submitted by the following stakeholders. If appropriate, further information on these can be requested from the company supplying the information, as indicated in the attachments:

- Aquaminerals
  - **Humic and fulvic acids** from drinking water production
  - **Iron(hydr)oxide** from drinking water production
  - **PHBV**, Poly(3-hydroxybutyrate-co-3-hydroxyvalerate)) from fermentation of VFAs
  - **Kaumera Gum** from wastewaters (Nereda®)
  - **Ammonium salts from municipal wastewater**, via either gas stripping (see above), iron exchange or ion separation membrane
- WETSUS:
  - **Vivianite** from wastewater treatment
- SoilFood
  - **Nutrient residues from wood bioethanol production**

Further details of some of the materials listed above

Mineral nutrient products from gas scrubbing	Nitrogen recovery from scrubbing of digester methane, manure storage or drying or processing, or animal housing offgas. Possibly also sulphur recovery?	Production already full-scale – use in fertiliser or industrial chemicals (e.g. Yara) Already today considered to be a mineral fertiliser under German regulations.	Excluded from CMC1, because derived from waste. Possible inclusion in CMC11 (by-products) is unclear, and probably subject to variations between MS. Not covered by STRUBIAS "phosphate salts" because NOT a phosphate salt NOTE: stripping from flue gas from incineration of sewage sludge or biowaste or chicken manure (etc) is included in STRUBIAS "thermal oxidation materials or derivatives" (because this no longer refers to "ash", so de facto also covers flue gases from incineration).	Limit to "Mineral" fertilisers (i.e. < 1% C_{-org})	Contaminants and pathogens will not usually be in gases. Limit processing temperature (e.g. 150°C to cover drying) and avoid flue gases from combustion processes: flue gases from incineration processes may contain heavy metals, dioxins, etc. With such a temperature limit, there is no need to limit input materials because contaminants will not be found in gas.	See UrbanAgenda bottleneck report here

Ammonium salts from powder fire extinguisher refurbishment	During regular fire extinguisher maintenance, powder is removed. The part which cannot be re-used is cleaned using solvents (to remove additives such as silicone which improve spraying) to deliver clean ammonium salts (ammonium phosphate, ammonium sulphate)	The EU potential for this recycled material is estimated at c. 100 000 t/y. Process demonstrated in Horizon Europe PHOSave project	Spent material is waste -> excluded from CMC1. Solvent cleaning is required, so can only be included in CMC-11 if this is extended to "and derivates"		Solvent cleaning ensures contaminant removal. Resulting product (ammonium phosphate) can be used directly as a fertiliser, after granulation or blending.	www.phosphorusplatform.eu/Scope127 and www.phosphorusplatform.eu/Scope123
Mineral salts recovered from waste incinerator ashes.	Chemical re-processing of the fly ash from municipal solid waste (MSW) or other waste incinerators. Potassium is c 3% of MSW incinerator fly ash (as K). Ammonia used to remove NO_x in incinerator exhaust gas is also recovered.	7 000 t/y of potassium (K) in Sweden from MSW incinerator fly-ash alone (15 incinerators) → nearly 200 000 tK/y in Europe (410 incinerators). Full scale plant under construction in Sweden (130 000 ty/y fly ash) EasyMining Ash2Salt	Excluded from STRUBIAS "thermal oxidation derivates" because MSW excluded from input list. MSW is a waste, so excluded from CMC1	PFC heavy metal limits plus STRUBIAS "thermal oxidation" contaminant limits could be applied	Heavy metals must be removed. Incineration contaminants (dioxins etc) are not expected in fly ash, but should nonetheless be verified.	EasyMining press release 26th May 2020
"Spent acids": Derivates of used mineral acids (e.g. sulfuric, phosphoric,	Inputs are spent acids from, e.g.:	Widely used today in the production of mineral fertilisers.	Such acids are not used as such in FPs (so only relevant to include in CMC11 if this is widened to "and derivates").	The spent acid itself is NOT a CMC. The CMC is "derivates" produced from these spent acids	Heavy metals covered in PFC criteria need not be considered.	Fertilizers Europe by-products document 'Re-cycling and symbiosis, Use

nitric …) from various chemical processes	• gas drying and refrigerants, • cleaning of silicon wafers, • production of nitroguanidine, • production of surfactants, • production of laurolactam, • production of lead, • titanium dioxide production, • anodising processes, • metal smelting, • concentration of nitric acid, • …		Suppliers cannot ensure classification by national authorities as by-products (they are classified as waste) so in then cannot be used as precursors for production of CMC1 materials.	by a chemical reaction (in which the spent acid disappears) with reagents which are conform to the criteria of CMC1 or CMC11 (but have not undergone conformity assessment).	Specific heavy metals or organic contaminants resulting from certain industrial processes (e.g. titanium) should be limited in the derivate (CMC)	of by-products within the fertilizer industry" September 2017