

## **ESPP proposals for secondary materials for consideration as new CMCs or by modifications of existing CMCs in the EU Fertilising Products Regulation**

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<p><b>Derivates of secondary mineral acids</b></p> <p>E.g. sulfuric, phosphoric, nitric ...) where these have waste status.</p>	<p>Inputs are spent acids, after use in e.g. metal preparation before painting, or other minerals from the following production processes or offgas purification:</p> <ul style="list-style-type: none"> <li>• Oil and gas refining</li> <li>• Caprolactum</li> <li>• Titanium dioxide</li> <li>• Steel, copper, zinc ...</li> <li>• Methyl methacrylate</li> <li>• Acrylonitrile</li> <li>• Nitrates, urea ...</li> <li>• Melamine</li> <li>• ...</li> </ul>	<p>Such acids and minerals can be used as precursors in production of CMC1 materials, but only if they have “by-product” status, and not if they have (or have had) “waste” status. This classification is inconsistent between Member States.</p> <p>Widely used today in the production of mineral fertilisers.</p> <p>Source: Fertilizers Europe “Circular Economy &amp; the European fertilizer sector” <a href="#">2019</a>.</p>	<p>It is ESPP’s understanding tha:</p> <ol style="list-style-type: none"> <li>a) if these materials <u>are mineral salts of N, P, S, Ca</u> then (subject to conditions) then they can be used as components of fertilisers under CMC15 point (1);</li> <li>b) if a <u>fertiliser is produced from these materials</u>, and this fertiliser is a mineral salt of N, P, S, Ca, then this fertiliser is covered by CMC15 point (2a)</li> </ol> <p>However, if such spent acids (classified as waste) are used to process ash, then the resulting fertilising product could be (i) excluded from STRUBIAS CMC13 because “derivates” exclude use of waste and (ii) excluded from CMC15. The possible exclusion from CMC15 would depend on whether “substances and mixtures” in CMC15 point (2a) is interpreted to include ash. This could depend on whether or not the ash was REACH registered (which would be an inappropriate requirement). The above could be the case if secondary sulphuric acid (e.g. from oil refinery sulphur removal) were used to extract phosphorus from sewage sludge incineration ash.</p>	<p>No specific contaminant concerns. Contaminant limits are specified in PFC criteria.</p> <p>Purity and contaminant criteria of CMC15 should be applicable.</p>
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<p><b>Potassium, calcium and other salts recovered from (non CMC13) ashes</b></p>	<p>Chemical re-processing of the fly ash from municipal solid waste (MSW) or from other waste incinerators or waste-to-energy plants or from cement production.</p> <p>Potassium is c. 2% of coal power plant ash, c. 3% of MSW incinerator fly ash (as K).</p>	<p>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 <a href="#">incinerators</a>).</p> <p>A first full scale plant has been constructed in Sweden with the plan to start operation in the beginning of 2023 (130 000 t/y fly ash), producing about 3 500 t/y KCl / and 750 t/y ammonium sulphate <a href="#">EasyMining Ash2Salt</a></p> <p>NOAH (Norway) is currently operating a pilot plant with planned 80 000 t/y of salts (KCl, NaCl and CaCl<sub>2</sub>) Langøya, ReSalt, CarbonTech (see IEA Biotechnologies <a href="#">10/2020</a>) and <a href="#">NOAH</a>.</p>	<p>Excluded from STRUBIAS “thermal oxidation derivatives” because MSW excluded from input list.</p> <p>MSW and other ashes are a waste, so excluded from CMC1.</p> <p>Excluded from CMC11 and CMC15 because not from a “production process” and not from offgas.</p>	<p>Heavy metals should be removed.</p> <p>Incineration contaminants (dioxins etc) are not expected in fly ash, but should nonetheless be verified. PFC heavy metal limits plus STRUBIAS CMC14 “thermal oxidation” contaminant limits could be applied.</p>
<p><b>Ammonium salts from ABC powder fire extinguisher refurbishment</b></p>	<p>During regular fire extinguisher maintenance, all the powder is removed and replaced. The part which cannot be re-used in fire extinguishers can be processed to remove additives (such as silicone which improve spraying of extinguishers) and blended to deliver a clean homogenous mixture of ammonium salts (ammonium phosphate, ammonium sulphate).</p>	<p>The EU potential for this recycled material is estimated at c. 100 000 t/y.</p> <p>Process demonstrated in Horizon Europe <a href="#">PHOSave</a> project.</p> <p>Demonstrated in “<a href="#">FIRECOMPOST</a>” project, funded by the Calabria Region POR FESR-FSE 2014-2020.</p> <p>For information on recovery potential see <a href="#">Eureau Fact Sheet</a>.</p>	<p>Spent material is waste -&gt; excluded from CMC1.</p> <p>Not covered by CMC11 because not “produced as an integral part of a production process”</p> <p>Not covered by CMC15 because not “recovered from waste generated from a production process”</p>	<p>Solvent cleaning ensures contaminant removal.</p> <p>Resulting product (ammonium phosphate – ammonium sulphate) can be used directly as a fertiliser, after granulation or blending.</p>

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<p><b>Nitrogen recovery from liquid phase of wastewaters</b></p>	<p>Nitrogen is recovered from municipal wastewater (in sewage or sludge treatment) or other wastewaters (e.g. food industry, landfill leachate) by some combination of membrane separation, ion exchange, adsorption - regeneration, the processing to ammonia salts.</p>	<p>EasyMining <a href="#">process</a>: 4 m<sup>3</sup>/h pilot operating. In some cases, this functions via a Precipitated Phosphate Salt, in which case covered by CMC12.</p> <p>Cetaqua process under development using commercially available membranes, 1 m<sup>3</sup>/h pilot <a href="#">tested</a>, LIFE ENRICH, at ESTE wwtp, Murcia, Spain, producing 45l ammonium nitrate per week.</p> <p>For potential, see Eureau Fact Sheet. <a href="https://www.eureau.org/">https://www.eureau.org/</a> (publication pending).</p>	<p>Recovery from offgases from wastewater treatment is covered under CMC15 2(b)iii but NOT recovery from the liquid flows in wastewater treatment.</p> <p>Excluded from CMC11 because wastewater treatment is not a “production process”.</p> <p>Excluded from CMC1 because the initial substrate is a waste.</p>	<p>Need to verify heavy metals, organic contaminants, pathogens.</p> <p>Proposal: use the same limits for organic carbon (&lt;0.5%) and for contaminants and pathogens as in CMC15.</p>
<p><b>Biomass grown in sewage and in other waste waters</b></p> <p>i) mechanically processed</p> <p>ii) chemical extracts.</p>	<p>Algae production can be “fed” with wastes, including nutrients in manure, sewage, digestates, or in biofuel processing discharge, or offgas from cement production (CO<sub>2</sub> or NO<sub>x</sub> mitigation);</p> <p>Includes algae, micro-algae, duckweed, other photosynthetic aquatic plants.</p> <p>Can be used either as fertiliser (nutrient content), soil improver (organic carbon) or in biostimulants.</p>	<p>Operational full scale</p> <p>For potential see Eureau <a href="#">Fact Sheet</a></p> <p>See ESPP – Eureau - EABA letter to DG ENVI and DG GROW of 17<sup>th</sup> November 2021 at <a href="http://www.phosphorusplatform.eu/regulatory">www.phosphorusplatform.eu/regulatory</a></p>	<p>Both (i) and (ii) may be excluded from CMC1 because waste derived, but this is today not clear.</p> <p>(i) included in CMC2 (plant materials) but only if processing is mechanical only (not e.g. extracts), and if blue-greens not detectable, and if free from foreign materials (plastics, litter, ...).</p> <p>(iii) authorised as input to compost /digestate (CMCs 3,5) under 1c. “living or dead organisms or parts thereof” ...</p>	<p>Such waste-fed materials are generally excluded from use as animal feed or in human food, so fertilisers are optimal use.</p> <p>Algae or plants may accumulate certain contaminants from the wastewater in which they are grown.</p>
<p><b>Natural biomass collected as waste</b></p> <p>after processing</p>	<p>E.g. seaweed from beach cleaning or canal clearing</p>	<p>Propose to consider with waste-fed algae etc. above</p>		

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<p><b>Fish excreta</b></p>	<p>Fish excreta are excluded from "manure" under the ABP</p>	<p>Estimated currently c.20 processors in Norway and others starting up. For one example see <a href="#">here</a></p> <p>Total fish sludge in Norway alone is &gt; 800 000 tDM/y. Only land or closed-pen based is available for recycling, but this part is increasing, see <a href="#">here</a> p14.</p> <p>Disposal costs and nutrient content make recycling to fertiliser potentially attractive.</p>	<p>Currently not listed for use in FRP CMC3 compost, CMC5 digestate, CMC10 animal by-products, CMC12 precipitated phosphates, CMC 13 ash-based products, CMC14 pyrolysis/biochars, and should be added to each of these CMCs.</p>	<p>Maybe high Zn content because of Zn in fish feed.</p> <p>Proposal: for FPR, accept same requirements as for other "manures" (sterilisation in some cases)</p> <p>Possibly accept also specific national sterilisation processes (e.g. for Norway, see <a href="#">here</a> pp31-32).</p> <p>Norway <a href="#">report</a> concludes use is safe for humans and farm animals (untreated use near water could pose risks for fish, but this is not relevant for FPR products).</p> <p>Pertinent to request EFSA Opinion?</p>
<p><b>Fish and seafood processing residues</b></p> <p>Inc. fish bones</p>	<p>Certain by-products from processing fish and shellfish for production of human food or animal feed.</p> <p>In particular, acid-treated fish bones, which have high phosphorus and nitrogen content.</p>	<p>"Effect of fish bones and algae fibre as fertilisers for ryegrass", <a href="#">Norsok 2019</a></p> <p>"Valorisation of fish bones ....", A-K. Loes et al., <a href="#">2021</a>.</p> <p>"Harvesting our fertilisers from the sea... A-K. Loes et al <a href="#">2021</a>.</p>	<p>Not currently covered by EFSA Opinion of 20 October 2021.</p> <p>Fish bones, treated with formic acid to render nutrients better plant available, are authorised as a fertiliser in Organic Farming in Norway.</p> <p>"Fish meal" is included in the list of Authorised Fertilisers under the EU Organic Farming Regulation (2021/1165, Annex II).</p> <p>Fish meal is not addressed in the EFSA Opinion of 20/10/2021 concerning ABPs for fertiliser materials.</p>	<p>When leaving the storage, the material is ABP Cat. 3.</p> <p>The material is permitted for use in certified Organic Farming by the Norwegian Food Safety Authority</p> <p>Material not yet commercially available</p> <p>For contact to industry: <a href="mailto:runar.fjellgaard@pelagia.no">runar.fjellgaard@pelagia.no</a>; <a href="mailto:andreas.nordgreen@pelagia.com">andreas.nordgreen@pelagia.com</a></p> <p>Request EFSA Opinion?</p>

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<p><b>Insect frass</b></p>	<p>Insect excreta, exoskeletons, un-eaten feed substrate</p>	<p>10 000 t/y in 2019 in Europe. Forecast 9Mt/y by 2030. Contains approx. 4%N, 1.3%P, 2.5%K.</p> <p>IPIFF statement  <a href="#">19<sup>th</sup> September 2019</a>  <a href="mailto:info@ipiff.org">info@ipiff.org</a> ; <a href="mailto:christophe.derrien@ipiff.org">christophe.derrien@ipiff.org</a></p>	<p>Excluded</p>	<p>Need for EFSA Opinion?: sieving out of larvae? Sterilisation?</p> <p>“Dejecta of insects” is authorised untreated (without sanitisation) in <b>Organic Farming</b> (see <a href="#">Regulation (EC) No 889/2008</a> Annex I page 79 - no conditions for use in the column on the right side. This dates from <a href="#">1994</a> originating from the use of dejecta of bees or other insects used in biocontrol.</p>
<p><b>Separately recovered human urine and derivatives</b></p>	<p>Urine from separate toilets or urinals, then some form of stabilisation (e.g. nitrification, chemical pH modification, filtration, fermentation) then drying or concentration (to facilitate transport, distribution, handling, application).</p> <p>Human urine can be processed to fertilising products in various ways (<a href="#">Larsen et al., 2021</a>). This can be done in processing units or by in-situ (in-toilet) processing (e.g. by a combination of pH-adjustment and convective air-drying).</p> <p>Precipitated phosphates from urine.</p> <p>Products can be solid or liquid fertilisers or biostimulants.</p>	<p>Vuna / VunaNexus <a href="#">Aurin</a> piloted and authorised as fertiliser in Switzerland (with activated carbon filtration to remove pharmaceuticals).  <a href="#">Toopi Organics</a> France (Paris <a href="#">OCAPI</a> project).  Sanitation360 AB (Sweden) <a href="https://sanitation360.se/">https://sanitation360.se/</a>  Blue Diversion Autarky EAWAG Switzerland. <a href="http://www.autarky.ch">http://www.autarky.ch</a> and <a href="#">Meyer et al. 2017</a>  Hydrohm BV (Uridis), Belgium <a href="http://www.hydrohm.com/uridis.html">www.hydrohm.com/uridis.html</a>  <a href="#">DLR</a> (German Aerospace Research Centre)</p> <p>Overall, several companies have operated pilots, up to 200 m<sup>3</sup> urine /year. A number of full-scale installations are under construction in France, Switzerland, Germany.</p>	<p>Human urine is excluded from the Animal By-Product Regulation by 2009/1069 art. 2.2k</p> <p>Human urine is not to date included in the authorised input materials to CMC3 and CMC5 (composts and digestates).</p> <p>Phosphates precipitated from separately collected urine may be excluded from CMC12 (“Precipitated phosphates and derivatives”) by art. 1(a). <b>This needs to be clarified.</b></p> <p>Authorised as fertiliser in Sweden. Registration underway in France. Aurin authorised as fertiliser in Switzerland and Austria</p>	<p>Need to define what conditions and treatments are required to ensure sanitary safety. Request EFSA Opinion.</p> <p>Pharmaceuticals are present in urine: removal processes are possible.</p> <p>A number of studies show biological safety, low contaminant levels.</p> <p>Two years’ analysis of Aurin production monitored to DIN SPEC 91421 shows contaminant and pathogen levels shows levels below limits for food or animal feed.</p> <p>Tens of field-scale fertiliser trials.</p>

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<p><b>Processed solids from dry toilets</b></p>	<p>Human excreta and urine, paper and material added for operation (sawdust, ...). After collection, processed by e.g. addition of organic acids, composting, fermentation and/or pyrolysis.</p>	<p>Pilots operational in Germany, Switzerland and elsewhere. <a href="#">Finizio</a> - Future Sanitation GmbH – Germany. <a href="#">Kompotoi AG</a> – Switzerland. Agronomic effectiveness of fertiliser products demonstrated in field trials. Risk analysis: Krause et al., <a href="#">2021</a>, IGZ <a href="#">project 2019-2020</a> and Bleuler et al., <a href="#">2021</a> for <a href="#">pyrolysis</a></p>	<p>Human urine is excluded from the Animal By-Product Regulation by 2009/1069 art. 2.2k Dry toilet solids are excluded from CMC14 “Pyrolysis and gasification materials”. Human urine and faeces or dry toilet solids are not included in the authorised input materials to CMC3 and CMC5 (composts and digestates). See proposed FAQ question concerning whether or not precipitated phosphates recovered from human urine are eligible under CMC12.</p>	<p>Need to define what conditions and treatments are required to ensure sanitary safety. Request EFSA Opinion. Safety criteria are specified by German DIN SPEC 91421. Achievement of this specification is <a href="#">demonstrated</a> for most of the companies cited.</p>
<p><b>Vivianite from sewage and from other waste liquors</b></p>	<p>Iron (II) (ferrous) phosphate is precipitated in municipal sewage sludge / digestate, then magnetically separated. Also address vivianite recovered from manure or other wastewater liquors.</p>	<p>Technology for recovery from municipal sewage digestate is under development: WETSUS <a href="#">ViViMAG</a> 1 m<sup>3</sup>/h pilot. Will be upscaled and tested by KEMIRA at 3 sites in Germany, Denmark &amp; The Netherlands in 2022. Vivianite is used as an iron fertiliser to treat Fe-chlorosis, see Diaz <a href="#">2010</a>, Eynard <a href="#">1992</a>, Rombola <a href="#">2003</a>, Rosado <a href="#">2002</a>, Santiago <a href="#">2010</a>, <a href="#">2013</a>. Vivianite recovery has potential for widespread development, because it is applicable to sewage works operating chemical P-removal (dosing iron salts) and this is the most widespread process for sewage works P-removal, with implementation increasing in response to tighter phosphorus discharge limits (EU Water Framework Directive water quality objectives for eutrophication control). WETSUS and KEMIRA estimate that roughly 100-200 kt/y of vivianite (DM) could be produced once the technology is mature and widely applied in EU countries.</p>	<p>Excluded from CMC12 “Precipitated phosphates” by 3(a) iron content.</p>	<p>Purity and contaminants levels are similar to recovered struvite. Proposal to apply the same contaminant limits as CMC12. Could be authorised as an iron fertiliser (micronutrient) but not a phosphate fertiliser, in order to avoid discussions about plant availability of the phosphorus.</p>

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<p><b>Humous from tree bark</b></p>	<p>Composting process not CMC3 conform.</p>	<p>Bark considered “waste” by some MS, “by-products” by others. Source: Growing Media Europe.</p>	<p>Not CMC3 Not CMC2 Not CMC1 because not a “substance or mixture” and under CMC1 would require REACH registration, which is unrealistic: compost is exempted from REACH registration in Annex V – BUT CMC1 specifies the exemption from REACH Registration ONLY for substances in points 6 to 9 of Annex V</p>	<p>Tree bark can concentrate heavy metals but these are limited in PFCs 3 and 4</p>
<p><b>Pulp &amp; paper industry limes</b> Lime mud (CaCO<sub>3</sub>), lime dust (CaCO<sub>3</sub>) and burnt lime (CaO) from the pulp &amp; paper industry.</p>	<p>Lime mud and burnt lime are side streams from paper and pulp mills. Lime dust originates from paper and pulp mills’ flue gas cleaning.</p>	<p>Commonly used as liming materials in agriculture in Finland and in Sweden, generally “as is” without reprocessing or hygienisation. Company example: Soilfood sells over 40 000 t/y pulp &amp; paper side stream limes to agriculture <a href="https://soilfood.fi/">https://soilfood.fi/</a></p>	<p>Excluded from CMC1 because considered waste or by-product within the meaning of Directive 2008/98/EC. If classified as “by-products”: - excluded from CMC11 because art. 1(b) does not include production processes using plants as inputs, or using paper waste (recycling), which is the case for the paper &amp; pulp production. - excluded from CMC15, because (2) limits to materials “recovered from waste”. If classified as “waste” (or recovered from “waste”) - excluded from CMC11 - excluded from CMC15 because (2a), as above, does not include production processes using plants as inputs, or using paper waste (recycling).</p>	<p>Heavy metals are regulated in PFC2.</p>
<p><b>Pulp &amp; paper fibrous sludges</b> Organic-containing fibrous sludges from pulp &amp; paper industries</p>	<p>Primary and secondary sludges with &gt; 0.5% organic carbon.</p>	<p>Primary sludge consists of wood fibres too short for use, and is used as a soil improver without reprocessing. Secondary sludge is process wastewater biological treatment sludge, and is composted, stabilised and/or hygienised before use as a soil improver. Company example: Soilfood Finland sells over 120 000 t/y pulp &amp; paper sludges to agriculture <a href="https://soilfood.fi/">https://soilfood.fi/</a></p>		<p>Hygienisation for secondary sludges. Heavy metals content will depend on the mill process and should be verified.</p>




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<p><b>Digestate from biorefineries processing biomass</b></p> <p>E.g. to produce biofuels</p>			<p>Not covered by CMC4 “Fresh crop digestate”.</p> <p>Not covered by CMC5 (other digestate) 2c “living or dead organisms or parts thereof which are unprocessed or processed only by manual, mechanical or gravitational means ....”</p>	
<p><b>Macro- and micronutrients recovered from battery recycling</b></p>	<p>Recovery of purified mineral products from end-of-life consumer or industrial batteries</p>	<p>Micronutrients: e.g. Tracegrow Oy in Finland who extracts micronutrients from used alkaline batteries ( see <a href="#">ESPP eNews n°62</a>).</p> <p>Alkaline batteries contain Zn and Mn, both highly critical for farming. C. 30 000 t/y of alkaline battery waste is produced in the EU, from which c. 70 million litres of fertiliser could be manufactured, substituting the use of virgin materials. Currently battery waste is incinerated and nutrients are lost.</p> <p>Phosphorus from end-of-life lithium iron phosphate (LFP) batteries used for electric vehicles, energy storage <a href="#">see ESPP eNews n°60</a></p>	<p>Excluded from CMC1 because from waste.</p> <p>Mineral salts of N, S, P, Ca are covered under CMC 15 point (2a), subject to conditions. However, this will not cover micronutrient fertilising products.</p> <p>Also, to our understanding, in CMC15 the phrase “production process that uses as input materials substances and mixtures” excludes waste treatment processes, such as battery recycling, despite this process could also be considered as a steel production process.</p> <p>Creation of separate CMC for industrial circular economy materials (various industrial waste and side streams containing different nutrients) might be functional solution for the battery recycling based products, and for other industrial recycling processes.</p>	<p>Contaminant requirements</p>
<p><b>Plasma treatment of digestates</b> (CMC5)</p>	<p>Plasma treatment increases nitrogen content and stabilises N, reducing ammonia and methane emissions by acidifying (to pH c. 5-6) without using chemicals.</p>	<p>Plasma treatment of digestates: see N2 Applied in <a href="#">ESPP-DPP-NNP Nutrient Recovery Technology Catalogue</a>.</p>	<p>CMC5 does not allow for plasma treatment and this is not included in the proposed amendment on “post-processing” of digestate.</p>	<p>Safety and contaminant criteria already ensured by CMC5</p>

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<p><b>P leached from sludge or biochars</b></p> <p>Phosphorus leached from sewage sludge, or from pyrolysis products, by acid, solvent CO<sub>2</sub>.</p>	<p>Use of acid or solvent or other media to leach phosphorus from sewage sludge, or from biochars / thermal hydrolysis materials from sewage sludge or other organic inputs. The resulting phosphoric acid or P-enriched medium is then used to produce a fertilising product, e.g. by precipitation, extraction or concentration</p>	<p>Acid leaching currently being researched by several companies or institutes. See Tasca in ESPP's <a href="#">SCOPE Newsletter n°141</a>, Shariff in <a href="#">SCOPE Newsletter n°134</a></p> <p>Solvent leaching under development by RSR Green Sentinel, see <a href="#">ESPP-DPP-NNP Nutrient Recovery Technology Catalogue</a>.</p> <p>Liquified CO<sub>2</sub> extraction was developed by Budenheim but is currently not under implementation, see Technology Catalogue as above.</p> <p>HTCycle recover phosphorus by precipitation after acid leaching of hydrothermal carbonisation coal from sewage sludge, see <a href="#">ESPP eNews n°52</a>.</p>	<p>CMC12 does not include precipitation from phosphoric acid or other media leached from sewage sludge.</p> <p>CMC12 does include precipitated phosphates from the listed input materials after “thermal hydrolysis up to 275°C” (as well as anaerobic digestion, composting, etc) but does not specify that a leaching stage is possible (precipitation not directly from the thermal hydrolysed sludge, but after acid leaching from the thermal hydrolysis coal).</p> <p>Not covered by CMC13 because not via incineration (not recovery from ash, recovery directly from the sewage sludge).</p> <p>CMC14 does not cover “derivates”</p>	<p>Safety for precipitated phosphates will be “better” than precipitation directly from sewage sludge = CMC12.</p>
<p><b>Pre-processed input materials for CMC 13 and CMC14</b></p> <p>Including input of digestates, composts.</p>	<p>In some cases, digestate or compost may go to incineration or pyrolysis, as the most convenient valorisation route (local logistics), or for energy recovery.</p> <p>Input materials for CMC13 or 14 may be otherwise processed.</p>		<p>Currently input materials to CMC13 cannot be pre-composted/digestated (this is allowed in CMC14).</p> <p>Add to CMC 13 input materials the same specification as for CMC12</p> <p>“In addition, any of the above input materials processed by manual, mechanical or gravitational means, solid-liquid fractionation using biodegradable polymers, dissolution in water, flotation, extraction with water, steam distillation or heating solely to remove water, thermal hydrolysis, anaerobic digestion or composting.”</p>	<p>Such pre-processing of input materials will not deteriorate safety, so existing contaminant and quality criteria of CMC13 and 14 suffice.</p>
<p><b>Pyrolysis and gasification materials from sewage sludge</b></p>	<p>Biochars produced from sewage sludge are today authorised as fertilisers in several EU countries, including:</p> <ul style="list-style-type: none"> <li>- Czech Republic, by Annex 1 of <a href="#">Decree 474/200</a></li> <li>- Sweden.</li> <li>- Italy, by standard <a href="#">published February 2022</a>.</li> </ul> <p>Denmark. See <a href="#">here</a></p>	<p>The EU Joint Research Centre (JRC) preparatory study (<a href="#">STRUBIAS</a>) concluded (p137-p138) that there was not sufficient evidence made available at the time to prove elimination of organic contaminants, but stated that this “could possibly be revised once robust and extensive techno-scientific evidence underpins the safe use of (specific) pyrolysis &amp; gasification materials derived from sewage sludge”.</p>	<p>CMC14 currently excludes sewage sludge as an input material.</p>	<p>Specific processing conditions to be defined (temperature, time) in order to ensure elimination of organic contaminants.</p>

## ESPP proposals for secondary materials for consideration as new CMCs or by modifications of existing CMCs in the EU Fertilising Products Regulation

<p><b>Multi-stage thermal oxidation processes</b></p>	<p>Processes resulting in thermal oxidation, with the same end results as defined in CMC13, but with several combustion stages.</p>	<p>Example Süzle Kopf Syngas <a href="http://www.kopf-syngas.de">www.kopf-syngas.de</a></p>	<p>Multi-stage combustion processes may be excluded from the current CMC13 criteria which include a process specific and limitative process description (§3 “non-oxygen limiting conditions” and §4 a “chamber”). Criteria should be widened to include all processes which include a non-oxygen limiting thermal oxidation stage with the time-temperature specifications of §3 and which achieve the <math>C_{org}</math> elimination requirement of §4b.</p>	<p>Modification of CMC13 – same contaminant limits.</p>
<p><b>Modifications CMC13 conditions</b></p>	<p>More flexible sewage sludge combustion conditions,, subject to ensuring contaminant limits in ash</p>	<p>WienEnergie input 21/12/23</p>  <p>WienEnergie CMC13 comments 2`</p>	<p>Allow CMC13 combustion temperature down to 800°C subject to national IED authorisation, organic carbon elimination, contaminant limits, etc. Enables improved energy efficiency.</p> <p>Allow CMC13 input of certain “hazardous wastes” (oils) as secondary fuels, again subject to contaminant limits etc.</p>	<p>Modification of CMC13 – same contaminant limits.</p>