

The European Commission's
science and knowledge service
Joint Research Centre

Towards the implementation of fertilisers derived from secondary raw materials in the EU Fertiliser Regulation – STRUBIAS

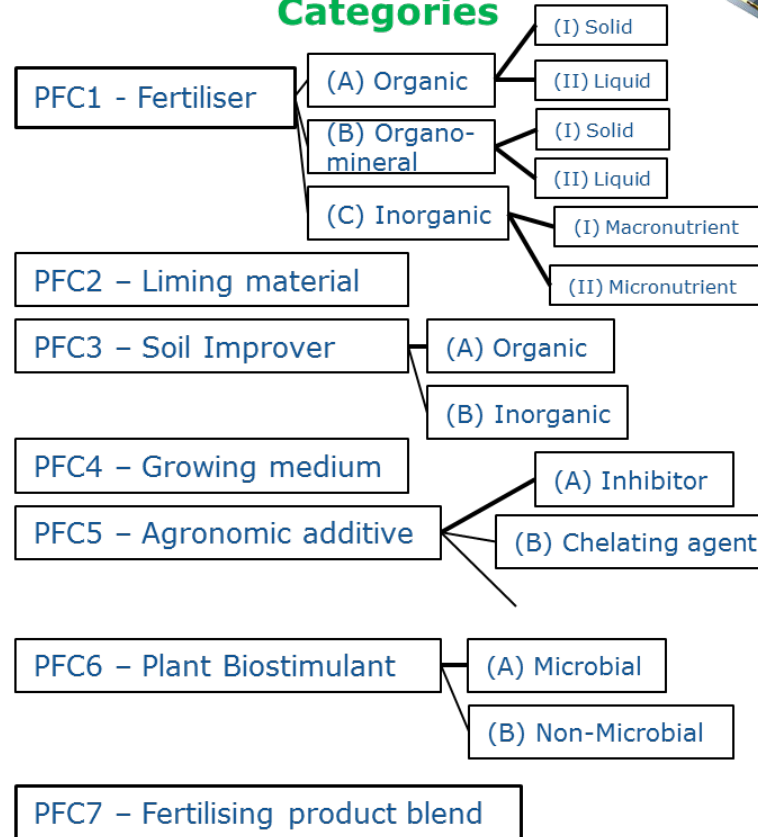




Component Material Categories

- CMC 1: Non-polymer virgin materials
- CMC 2: Simple plant parts or extracts
- CMC 3: Compost
- CMC 4: Energy crop digestate
- CMC 5: Other digestate
- CMC 6: Food industry by-products
- CMC 7: Micro-organisms
- CMC 8: Agronomic additives
- CMC 9: Nutrient polymers
- CMC 10: Other polymers
- CMC 11: Animal By-products

Product Function Categories



Future STRUBIAS CMCs: recovered phosphate salts, ash-based materials, pyrolysis materials*

*STRUBIAS: STRUvite, BIochar, AShes as working definitions

A CE fertiliser should meet the CMC and PFC requirements

Normal industrial practice (sieving, grinding, mixing, etc.) after CMC stage has been reached

JRC

STRUBIAS sub-group

two tasks to be run in parallel

criteria development:

- recovered phosphate salts
- ash-based materials
- pyrolysis materials

STRUBIAS materials should meet quality requirements so that they can be used directly without any further processing other than normal industrial practice.

impact assessment:

- substitution potential for mined P-fertilisers
- assessment of agronomic efficiency
- Impacts of production and use of STRUBIAS materials upon environment, human health and the internal market

possible inclusion in Revised EU Fertiliser Regulation

The JRC assesses STRUBIAS materials against following criteria:

- *The material shall provide plants with nutrients or improve their nutrition efficiency, either on its own or mixed with another material*
- *The use of the materials will not lead to overall adverse environmental or human health impacts;*
- *A demand exists for such a recovered fertilising material, based on the current market and the projected future market conditions.*

Nutrient recovery rules describe specific CMC requirements that shall be fulfilled by the STRUBIAS materials which are used as ingredients in CE marked fertiliser products.

JRC STRUBIAS work

Joining in-house and external know-how



JRC and COM techno-scientific team

Technical Working Group (STRUBIAS subgroup) of 33 organisations:

- Member State representatives (12)
- Industrial and environmental experts (21)



Scientific collaborations within and outside JRC

criteria development:

- Based on the *participatory* "Sevilla" process for the development of Best available techniques REFERENCE documents (BREFs) and End-of-Waste criteria
- Techno-scientific information collected (Background Document of Kick-off Meeting, questionnaires, etc.)
- Initial draft proposals have been laid down in STRUBIAS Interim Report of May 2017, feedback by 14 September
- In an *interactive* and *iterative* manner JRC will evaluate the feedback received from the STRUBIAS sub-group and incorporate any further pertinent modifications
- Final report and conclusions expected by end 2018 (-> 15 months to go)

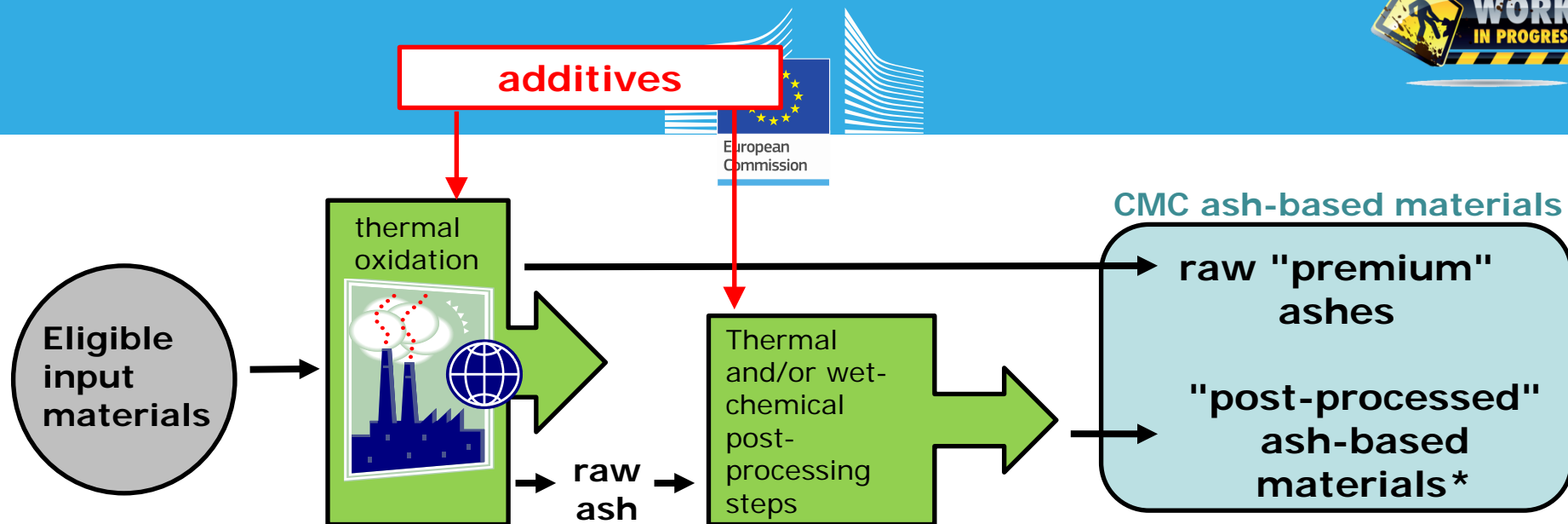
Recovered phosphate salts

- Precipitation process under controlled conditions
- Category expanded from “struvite” to “recovered phosphate salts” to enable inclusion of Ca phosphates and mixtures of Ca and Mg phosphates
- Differentiation from sludge (high P content, low in organic matter)
- Eligible input materials not only include (urban) waste waters and resulting sludges, but also manure, materials from food processing industries, biowaste.



Ash-based materials

- Thermal oxidation process (oxygen not limiting), mono-incineration or co-incineration
- Process conditions: Industrial Emissions Directive criteria (850°C, > 2 seconds, organic C content < 3%), exceptions for specific biomass materials
- Effective removal of organic contaminants, mostly a focus on metals and metalloids
- Wide-ranging input material list, including waste-based materials, animal by-products, minerals and ores, biomass used for renewable energy production
- Post-processing of raw ashes



(* these include materials that are the result of the post-processing of raw ashes, e.g. AshDec fertiliser, MAP, TSP that are (partly) derived from secondary raw materials, etc,)

CMC criteria apply to the end-material of the thermo-chemical manufacturing process, not to raw ashes that are used as intermediates in a manufacturing process

Phosphate rock →

Raw ash →

CMC criteria

TSP,
DAP,
MAP,
...

CMC 1
(virgin materials)

TSP,
AshDec,
MAP,...

CMC XX
(ash-based materials)

Pyrolysis materials

- Thermo-chemical conversion process in oxygen-limiting conditions (hydrothermal carbonisation, pyrolysis, gasification)
- Include both C-rich materials (“biochars”) as mineral-rich materials (“pyrogenic carbonaceous materials”)
- Focus on C-stable materials in line with definition and scope of CMC as soil improving properties (porosity, specific surface area, etc.) and material safety are correlated to C-stability
- Input materials: biological materials and animal by-products (associated to stricter thermo-chemical process conditions)
- Document information on material properties to end-user

Thank you.

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