



# Assessment of the potential for new feedstocks for the production of advanced biofuels

(Renewable Energy Directive – Annex IX)

## 1<sup>st</sup> Stakeholder Consultation Results Updated Shortlist



July 2020



## I. BACKGROUND

The European Commission (DG ENER) awarded Tender ENER/C1/2019-412 to a consortium composed of E4tech (Lead), the ICCT, Wageningen Research, Cerulogy, Navigant and SCS. The objective of this project is to assist the European Commission in the evaluation of biofuel feedstocks, which could be added to Annex IX of the Recast of the Renewable Energy Directive (EU 2018/2001), also known as “RED II”, following the process described in Article 28 of the Directive.

The project is divided into three Tasks:

- 1) **Task 1** will establish a long list of potential biofuel feedstocks for inclusion in Annex IX and conduct a preliminary assessment of these feedstocks to produce a short list for further assessment. The long list and preliminary assessment are based on the consortium’s expertise, a literature review and the current **stakeholder consultation**. The final selection of the shortlist of feedstocks for consideration under Task 2 will be made by the Commission.
- 2) **Task 2** will assess in detail each feedstock in the short list against the eligibility criteria described in Article (28) of RED II. The consortium will provide the European Commission with its conclusions with regards to whether each feedstock in the long list complies with the eligibility criteria.
- 3) In addition to the in-depth assessment conducted in Task 2, **Task 3** will look specifically at the risk of fraud associated with support for the use of new and existing Annex IX feedstocks. Informed by consideration of documented cases of fraud, the consortium will establish a set of fraud risk indicators and consider options available to mitigate identified fraud risks.

The **Stakeholder Consultation** held in Task 1 of the project specifically aims to:

- Help identify any other potential feedstocks not yet included on the long list;
- Provide additional evidence and sources of information to support the assessment;
- Ensure transparency and inclusiveness;
- Enhance the robustness of results.

This document presents the results of the first round of stakeholder consultation held in April and May 2020, along with an updated shortlist of feedstocks based on the comments and suggestions received during the first round of stakeholder consultation. It also aims to identify feedstocks or feedstock categories for which a second round of stakeholder consultation is necessary to collect additional evidence and documentation to justify their inclusion in the short list.

## II. STAKEHOLDER INPUTS AND REVIEW PROCESS

Following the initial list suggested by the project consortium, a large number of suggestions were made during the stakeholder consultation. The majority of inputs recommended including additional feedstocks, with a smaller number recommending removing certain feedstocks.

### A. *Changes in feedstock categories*

The initial feedstock categories in the shortlist were as follows:

- Agricultural products (mostly residues from harvesting)
- Animal fats
- Intermediate and damaged crops
- Food-feed processing residues/waste
- Ligno-cellulosic crops
- Waste fats, oils and greases (FOGs)

- Others

The review of stakeholder inputs led the Consortium to revise the categories to allow a better grouping of feedstocks suggested for evaluation:

- Food-feed processing residues and waste
- Agricultural / Forestry residues and waste
- Cover and intermediate crops
- Landscape care biomass
- Animal residues and waste
- Wastewater and derivatives
- Fats, oils and greases (FOGs)
- Others

### *B. Consultation results and review process*

In total, 427 feedstock-specific suggestions were received from 79 organisations. 14 additional contributions were received, but these include high-level comments regarding the process and did not include any specific suggestions regarding the evaluation of feedstocks. We suggest forwarding these contributions to DG ENER separately.

Among the contributions received, certain feedstocks or feedstock categories were more significantly represented. The consortium received:

- 123 suggestions related to residues and waste from food and feed processing;
- 57 suggestions related to animal by-products (incl. fats);
- 33 suggestions related to intermediate/cover crops;
- 33 suggestions related to soapstock, acid oil, FFA and other derivatives from oleochemical processing;
- 30 suggestions related to Fatty Acid Distillates (FADs);

The Consortium followed a systematic process to review and evaluate stakeholder contributions. The following criteria were used to evaluate whether feedstocks should be added to the short list for further investigation or not (See annexes for definitions):

- 1) **Does the feedstock qualify as biomass?** Feedstocks from non-biogenic origin (e.g. fossil-based plastics, non-biogenic captured CO<sub>2</sub>) were systematically excluded. Biogenic CO<sub>2</sub> was also considered not in line with the definition of biomass, since it is not biodegradable; furthermore, it is not an energy carrier, therefore not a biofuel feedstock.
- 2) **Does the feedstock qualify as food/feed crop** as per RED II definition? Feedstocks qualifying as food/feed crop were systematically excluded.
- 3) **Is the feedstock already covered in [Annex IX](#)?** The consortium used the additional description of feedstock production processes and end-uses to establish a solid rationale as to whether the feedstock can be considered covered by Annex IX or not.

Suggestions in favour of the removal of existing Annex IX feedstocks were disregarded, in line with the scope of this study.

Qualification of feedstock as **food/feed crop** was not always possible with the current information and documentation provided by stakeholders. It is particularly important to determine whether crop-derived material qualifies as residue, in which case it could be shortlisted provided that it is not already covered by current Annex IX categories. The Consortium did not come to a clear conclusion regarding the food/feed crop status of four feedstocks, namely potato/beet pulp, molasses, fatty acid distillates (FADs) and distillers grains and solubles (DGS). Following internal discussions, the Consortium came to the conclusion that no simple investigation could be conducted within Task 1 to determine whether these feedstocks would unambiguously qualify as food/feed crop. It was

therefore decided to include all four feedstocks in the shortlist to further evaluate them as part of Task 2.

Similarly, **current coverage of some of the suggested feedstocks in Annex IX** remains unclear, in particular for Annex IX A part d) (Biowaste) and whether feedstocks are fit for use in the food/feed chain. Most of the feedstocks selected for a second round of consultation are those for which additional evidence is needed to determine whether they are already included in Annex IX.

Consequently, the review process resulted in three outcomes for the suggested feedstocks (See Figure 1):

- 1) “Include in shortlist” means that the project consortium had enough elements in hand to conclude that the feedstock meets the evaluation criteria and can be directly shortlisted for further evaluation in Task 2 and Task 3. Four feedstocks (see above), for which alignment with the food/feed crops definition could not be determined, were also added to the shortlist;
- 2) “Do not include in shortlist” means that the project consortium had enough evidence to conclude that the feedstock does not meet the evaluation criteria and shall not be shortlisted for further evaluation in Task 2 and Task 3. This could be for several reasons (see Figure 1). Although they met the evaluation criteria, the Consortium decided not to include sea algae and cyanobacteria as no meaningful inputs, evidence or documentation was provided during the first stakeholder consultation; or
- 3) “Take feedstock to a second round of consultation” means that the project consortium does not currently have enough evidence to conclude whether the feedstock is currently covered by Annex IX categories and should or should not be shortlisted. The second round of consultation will be held between July 31 and September 4, and will be focused specifically on gathering additional evidence and documentation for these specific feedstocks.

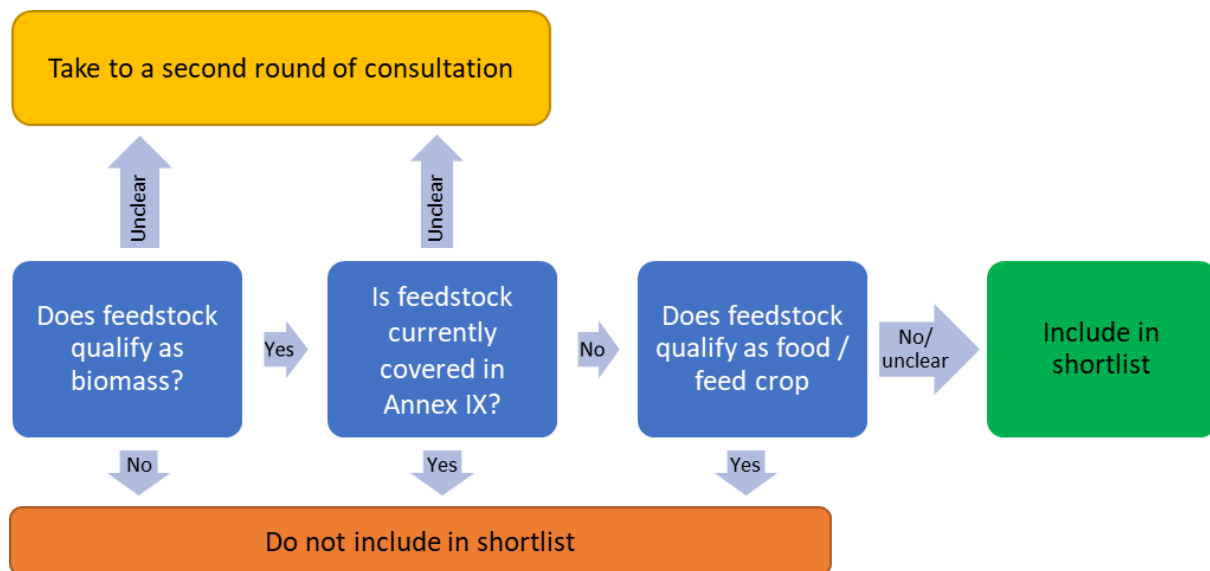


Figure 1: Summary of the review process

### III. UPDATED SHORTLIST

Table 1 summarises the current status of suggested feedstocks with regards to their possible inclusion in the shortlist (Note that some feedstocks were grouped by category. See details in appendix).

**Table 1: Summary of current feedstock status**

Include in short list (25)	Do not include (32)	Take to a 2 <sup>nd</sup> round of consultation (15)
<ul style="list-style-type: none"> <li>- Potato/beet pulp</li> <li>- Sugars (fructose, dextrose) refining residues</li> <li>- Molasses</li> <li>- Vinasse</li> <li>- Spent grains</li> <li>- Whey permeate</li> <li>- Olive pomace</li> <li>- Raw methanol</li> <li>- Oil, beans and meals derived from rotation crops</li> <li>- Biomass from fallow land</li> <li>- Biomass from degraded / polluted land</li> <li>- Mixture meadow</li> <li>- Damaged crops</li> <li>- Animal residues (not fat) Cat 2</li> <li>- Animal residues (not fat) Cat 3</li> <li>- Animal fats Cat 3</li> <li>- Municipal wastewater and derivatives (other than sludge)</li> <li>- Soapstock and derivatives</li> <li>- Brown grease</li> <li>- Fatty acid distillates (FADs)</li> <li>- Various oils from ethanol production</li> <li>- Distillers grain and solubles (DGS)</li> <li>- Other biowaste</li> <li>- Potato/beet pulp</li> <li>- Molasses</li> </ul>	<p><b>Covered in current Annex IX</b></p> <ul style="list-style-type: none"> <li>- Drink waste</li> <li>- Fruit and vegetable tails, tops/leaves, stalks, shells/husks and derivatives</li> <li>- Nutshells</li> <li>- Soy hulls</li> <li>- Food waste oil</li> <li>- Olive stones</li> <li>- Agricultural harvesting residues, including straws, stems, stalks, shells (not nuts) and hulls (not soy)</li> <li>- Palm fronds and trunks</li> <li>- Crude tall oil</li> <li>- Biomass from maintenance operations</li> <li>- Damaged trees</li> <li>- Unused feed/fodder from ley</li> <li>- Animal residues (not fat) Cat 1</li> <li>- Animal fats Cat 1-2</li> <li>- Manure and derivatives</li> <li>- Municipal Wastewater (sewage) sludge</li> <li>- Industrial wastewater and derivatives</li> <li>- Industrial storage settlings</li> <li>- Palm Oil Mill Effluents (POME)</li> <li>- Palm sludge oil</li> <li>- Used vegetable esters and oils</li> <li>- Biogenic fraction of waste</li> <li>- Trees / bushes (Not log/veneer grade)</li> <li>- Ligno-cellulosic crops or fraction of crops</li> <li>- Recycled/waste wood</li> <li>- Spent bleaching earth</li> </ul>	<ul style="list-style-type: none"> <li>- Bakery and confectionery by-products</li> <li>- Citrus peel and pulp</li> <li>- Defective fruit /vegetables</li> <li>- Beans, silverskin, and dust (excluding nut shells)</li> <li>- Starchy effluents</li> <li>- Alcoholic distillery by-products</li> <li>- Spent coffee grounds</li> <li>- Spent tea leaves</li> <li>- Dairy waste and residues</li> <li>- Non-edible cereal residues (residues from grain milling)</li> <li>- Rice by-products</li> <li>- Palm mesocarp fibres</li> <li>- Waste fish oil</li> <li>- EOL Tyres</li> <li>- Humins</li> </ul>
	<p><b>Qualify as food/feed crop</b></p> <ul style="list-style-type: none"> <li>- Cotton seeds</li> <li>- Opuntia</li> </ul>	
	<p><b>Do not qualify as biomass</b></p> <ul style="list-style-type: none"> <li>- Waste biogenic CO2 and CO2 from Direct Air Capture</li> <li>- Plastic waste</li> </ul>	
	<p><b>Limited interest, insufficient evidence or documentation</b></p> <ul style="list-style-type: none"> <li>- Cyanobacteria</li> <li>- Sea algae</li> </ul>	

**Appendix: Suggested way forward for evaluated feedstocks (Green: meets criterion / Red: does not meet criterion / Orange: unclear status)**

Category	Subcategory	Examples	Qualifies as biomass?	Qualifies as food/feed crop?	Covered in current Annex IX?	Consortium's conclusion	Additional remarks
<b>Food-feed processing residues and waste</b>	Bakery and confectionery by-products	By-products from bread, biscuits, wafer, etc.	Yes	No	Potentially not covered in Annex IX A part d) (Reportedly used as feed), but insufficient evidence.	<b>Take to a second round of consultation</b>	If energy recovery appears as the only realistic use, it will be considered covered under Annex IXA-part d)
	Drink residues	Citrus peel and pulp (pressing)	Yes	No	Potentially not covered in Annex IX A part d) (Reportedly used as feed and biogas feedstock), but insufficient evidence.	<b>Take to a second round of consultation</b>	If energy recovery appears as the only realistic use, it will be considered covered under Annex IXA-part d)
	Drink waste	Waste wine and beverage (unfit for human consumption) Spent alcohols	Yes	No	Covered in Annex IX Part A d).	<b>Do not include in shortlist</b>	Feedstock raised stakeholders' concerns regarding fraud risks, which require further investigation in T3 (Existing annex IX feedstocks will also be evaluated).
	Fruit / vegetable waste and residues	Defective fruit /vegetables	Yes	No	Potentially not covered in Annex IX A part d) (Reportedly used as feed), but insufficient evidence.	<b>Take to a second round of consultation</b>	If energy recovery appears as the only realistic use, it will be considered covered under Annex IXA-part d)
		Potato/beet pulp	Yes	Beet and potato pulps may fit the food/feed crops definition, i.e. pulp is one of the main co-products from beet and potato cultivation and it is usable as feed.	Potentially not covered in Annex IX A part d) (Reportedly used as feed), but insufficient evidence.	<b>Include in shortlist</b>	
		Tails Tops/leaves Stalks Husks	Yes	No	Covered in Annex IX A under parts q) and d).	<b>Do not include in shortlist</b>	

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	Beans, silverskin, and dust (excluding nut shells)	Cocoa Coffee Hazelnut	Yes	No	Potentially not covered in Annex IX A part d) (Reportedly used as feed), but insufficient evidence.	<b>Take to a second round of consultation</b>	If energy recovery appears as the only realistic use, it will be considered covered under Annex IXA-part d)
	Shells/husks and derivatives	Nutshells Soy hull	Yes	No	Covered in Annex IX A – part l) and p)	<b>Do not include in shortlist</b>	Definition of non-food ligno-cellulosic material includes shells and hulls.
	Starchy effluents	Starch slurry Steepwater Dry starch Thin stillage	Yes	No	Not covered in Annex IX A part d), since starch and other nutrients could theoretically be extracted for food/feed purposes.	<b>Take to a second round of consultation</b>	Residues must be used rapidly onsite as they tend to deteriorate fast. Starch slurry is double counted in RTFO (up to 20% dry matter content). If energy recovery appears as the only realistic use, it will be considered covered under Annex IXA-part d)
	Sugars (fructose, dextrose) refining residues	Ultrafiltration retentate Monohydrate hydrol	Yes	No	Not covered in Annex IX A part d), these residues can currently be treated and reinjected in the process.	<b>Include in shortlist</b>	Reinjection in process is reportedly water and CO2 intensive.
	Molasses	Molasses (i.e. effluents from the third crystallization stage in sugar refining)	Yes	Although molasses is a by-product from sugar refining, it still contains high level of sugar content and can be used as food. May qualify as food/feed crop.	Not covered in Annex IX A part d).	<b>Include in shortlist</b>	
	Vinasse	Vinasse	Yes	No	Not covered in Annex IX A – part d).	<b>Include in shortlist</b>	Possible other uses as fertiliser or adhesive for feed require further investigation.

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	Alcoholic distillery by-products	Heads and Tails Fusel alcohols/oils Technical ethanol	Yes	No	Could be considered as waste from spirits distillation (Ref 200/532/EC), therefore covered under Annex IX A part d). However, fusel alcohols/oils include methanol and butanol, which have other commercial uses.	<b>Take to a second round of consultation</b>	If energy recovery appears as the only realistic use, it will be considered covered under Annex IXA-part d)
	Spent grains	Brewers' spent grain/ spent grain (brewery)	Yes	No	Not covered in Annex IX Part A under (d). Possible use as food/feed requires further investigation.	<b>Include in shortlist</b>	
	Hot beverages	Spent coffee grounds Spent tea leaves	Yes	No	Further investigation required to check if there is any other use for the feedstock other than energy use.	<b>Take to a second round of consultation</b>	If energy recovery appears as the only realistic use, it will be considered covered under Annex IXA-part d)
	Dairy waste and residues	Dairy waste scum	Yes	No	Further investigation required to check if there is any other use for the feedstock other than energy use	<b>Take to a second round of consultation</b>	If energy recovery appears as the only realistic use, it will be considered covered under Annex IXA-part d)
	Food waste oil	Oil extracted from waste food from households and industry	Yes	No	Already covered under Annex IX A part b) and d).	<b>Do not include in shortlist</b>	
	Whey permeate		Yes	No	Not covered under Annex IX A part d)	<b>Include in shortlist</b>	Sufficient evidence that feedstock can be used as food/feed
	Non-edible cereal residues (residues from grain milling)		Yes	No	Potentially not covered in Annex IX A part d) (Reportedly used as feed), but insufficient evidence.	<b>Take to a second round of consultation</b>	If energy recovery appears as the only realistic use, it will be considered covered under Annex IXA-part d)
	Olive oil extraction residues	Olive pomace	Yes	No	Not covered under Annex IX.	<b>Include in shortlist</b>	Several food use of pomace exist, which require further investigation in Task 2.
		Olive stones	Yes	No	Covered under Annex IX A part d).	<b>Do not include in shortlist</b>	



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	Rice by-products	By-products obtained during and from the production of rice and its derivatives	Yes	No	Potentially not covered in Annex IX A part d) (Reportedly used as feed and biogas feedstock), but insufficient evidence.	<b>Take to a second round of consultation</b>	If energy recovery appears as the only realistic use, it will be considered covered under Annex IX A-part d)
<b>Agricultural / Forestry residues and waste</b>	Agricultural harvesting residues	Straws Stems Stalks Shells (not nuts) Hulls (not soy)	Yes	No	Already covered in Annex IX A p).	<b>Do not include in shortlist</b>	
	Palm harvesting residues	Palm fronds, palm trunk	Yes	No	Palm fronds are covered in Annex IX A q), while palm trunks are covered in Annex IX A part p).	<b>Do not include in shortlist</b>	
		Palm mesocarp fibres	Yes	No	Technically different from EFB, as it still contains oil (EFB oil), therefore not necessarily covered in Annex IX A part g).	<b>Take to a second round of consultation</b>	Additional evidence required to conclude on whether it is covered by Annex IX A part g)
	Seeds	Cotton	Yes	Yes. Seeds and oil cannot be considered as residues.	Not covered	<b>Do not include in shortlist</b>	
	Wood processing residues	Crude tall oil	Yes	No	Covered under Annex IX A o).	<b>Do not include in shortlist</b>	
		Raw methanol (processing residue from producing pulp at pulp mill)	Yes	No	Not included in Annex IX Part A (o).	<b>Include in shortlist</b>	
<b>Cover and intermediate crops</b>	Oil, beans and meals derived from rotation crops	Camelina Carinata Castor Silphium perfoliatum Tall wheat grass Tobacco	Yes	No	Not covered in Annex IX.	<b>Include in shortlist</b>	Intermediate crops are excluded from the definition of food and feed crops. The Consortium will look specifically at the production system used, first for intermediate crops generically, after which if

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							necessary, the consortium will consider specific cases.
	Opuntia (“prickly pear”)	Cactus that grows in semi-arid regions	Yes	Yes. Cultivated. Fruits are the main product.	Not covered in Annex IX.	<b>Do not include in shortlist</b>	
<b>Landscape care biomass</b>	Biomass from fallow land	Hay Legumes Grass	Yes	No	Only partly covered by Annex IXA part p)	<b>Include in shortlist</b>	
	Biomass from degraded/polluted land		Yes	No	Not covered in Annex IX.	<b>Include in shortlist</b>	
	Biomass from maintenance operations	Roadsides Environmental protection areas Harvesting of invasive species Bush encroachment	Yes	No	Covered under Annex IXA parts c) for parks, o) for forest maintenance operations and p/q) for bushes and grasses from other ecosystems.	<b>Do not include in shortlist</b>	
	Mixture meadow	Mix for example timothy ( <i>Phleum pratense</i> ), meadow & tall fescue and clover/legumes can be harvested from meadow land	Yes	No	Only partly covered by Annex IXA part p)	<b>Include in shortlist</b>	
	Damaged trees	Trees made improper for use as log grade due to diseases or other natural events	Yes	No	Covered under Annex IXA part q).	<b>Do not include in shortlist</b>	

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	Damaged crops	Food / feed crops made inedible due to diseases or other natural events	Yes	No	Not covered under Annex IX.	<b>Include in shortlist</b>	High risk of fraud reported by stakeholders.
	Unused feed/fodder from ley		Yes	No	Covered under Annex IX A part p).	<b>Do not include in shortlist</b>	Ley crops grown for feed / fodder are covered in the definition of non-food cellulosic material.
<b>Animal residues and waste (incl. mammals, birds, fishes, etc)</b>	Animal residues (not fat) Cat 1	Organs, ligaments, blood vessels, bones etc. (See EC Regulation 1069/2009)	Yes	No	Covered as industrial biowaste (part d) in Annex IXA)	<b>Do not include in shortlist</b>	Cat 1 material needs to be disposed of, either by incineration or as a fuel for combustion.
	Animal residues (not fat) Cat 2	Organs, ligaments, blood vessels, bones etc. (See EC Regulation 1069/2009)	Yes	No	Not covered in Annex IX.	<b>Include in shortlist</b>	
	Animal residues (not fat) Cat 3	See EC Regulation 1069/2009	Yes	No	Not covered in Annex IX.	<b>Include in shortlist</b>	
	Animal fats Cat 1-2	Beef tallow Poultry fat Swine fat	Yes	No	Covered under Annex IX B.	<b>Do not include in shortlist</b>	Animal fats are processed into FAME/HVO via conventional technologies. Therefore, they cannot fit under Annex IX A.
	Animal fats Cat 3	Beef tallow Poultry fat Swine fat	Yes	No	Not covered in Annex IX.	<b>Include in shortlist</b>	
	Manure and derivatives	Wet manure Dry manure Manure washwater	Yes	No	Covered under Annex IX A part f).	<b>Do not include in shortlist</b>	

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<b>Wastewater and derivatives</b>	Municipal wastewater and derivatives (other than sludge)	Wastewater FOGs extracted from sewage	Yes	No	Not covered in Annex IX.	<b>Include in shortlist</b>	Municipal waste water is outside the scope of the Waste Framework Directive (WFD); as Annex IX defines biowaste and mixed municipal waste with reference to the WFD then municipal waste water is out of the scope of items b) and c) of Annex IXA.
	Municipal Wastewater (sewage) sludge		Yes (Biogenic fraction)	No	Covered in Annex IXA part f).	<b>Do not include in shortlist</b>	
	Industrial wastewater and derivatives	Biodiesel wastewater Potato sludge Olive mill wastewater Food processing wastewater	Yes	No	Covered in Annex IXA part d).	<b>Do not include in shortlist</b>	
<b>Fats, oils and greases (FOGs)</b>	Soapstock and derivatives	Soapstock Acid oil Free fatty acids	Yes	No	Not covered in Annex IX A part d), since these cannot be considered waste.	<b>Include in shortlist</b>	
	Brown grease		Yes	No	Partly covered (Industrial fryers) in Annex IXA part d) but not for restaurants and households. Could also fit under Annex IX B (along with UCO).	<b>Include in shortlist</b>	If the scope of Biowaste in Annex IXA was extended (see below), biowaste from other businesses (e.g. restaurants) would be covered and therefore brown grease would not need its own category.
	Industrial storage settlings	FAME storage settlings FAME distillation residues Waste tank bottom oil	Yes	No	Covered in Annex IX A part d)	<b>Do not include in shortlist</b>	

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	Fatty acid distillates	PFADs Oilseed FADs	Yes	May qualify as food/feed crop.	Not covered in Annex IX.	<b>Include in shortlist</b>	
	POME		Yes	No	Covered under Annex IX A part g)	<b>Do not include in shortlist</b>	
	Palm sludge oil		Yes	No	Covered under Annex IX A part g).	<b>Do not include in shortlist</b>	PSO is a residue that is removed in the same stream as POME but at a stage just before delivery to the POME ponds. Some schemes/auditors recognise them as being the same and classify both as POME but others prefer to distinguish the two and require a separate title for the material.
	Used Vegetable Ester and Oils		Yes	No	Covered under Annex IX A part d) as this is part of waste streams.	<b>Do not include in shortlist</b>	
	Waste fish oil		Yes	No	If unfit for food/feed purpose, feedstock may be covered by Annex IXA d). No evidence provided that several grades of fish oil exist (e.g. food/feed grade vs waste fish oil). If fish oil and waste fish oil are the same feedstocks, then it should not be considered a waste and would therefore not be covered under Annex IXA d).	<b>Take to a second round of consultation</b>	Feedstock may qualify as Animal by-product cat 3 ("animal by-products from aquatic animals originating from establishments or plants manufacturing products for human consumption. Ref: Regulation 1069/2009). Further inputs required to understand exactly how the term "waste fish oil" should be understood.
<b>Others</b>	Biogenic fraction of waste	Municipal Solid Waste (MSW) Refused Derived Fuels (RDF) Biostabilized material & compost	Yes (Biogenic fraction)	No	Already covered in Annex IXA part b) (MSW/Refuse from households), c) (biostabilized material and compost) and d) (industrial waste and refuses).	<b>Do not include in shortlist</b>	

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	Various oils from ethanol production	Technical / Distillers Corn Oil	Yes	No	Not covered in Annex IX A part d).	<b>Include in shortlist</b>	
	Distillers grain and solubles (DGS)	Corn DDGS Wheat DDGS	Yes	May qualify as food/feed crop.	Not covered in Annex IXA part d).	<b>Include in shortlist</b>	
	Other biowaste	Biowaste as defined in point (4) of Article 3 of Directive 2008/98/EC, which are neither from households nor from industries (e.g. restaurants)	Yes	No	Not covered in Annex IXA part d).	<b>Include in shortlist</b>	
	Trees / bushes (Not log/veneer grade)	Black locust Pongamia Silvopastoral crops	Yes	No	Covered in Annex IXA part p) as long as it does not qualify as a log.	<b>Do not include in shortlist</b>	
	Plastic waste		No	No	Not covered in Annex IX.	<b>Do not include in shortlist</b>	Fossil fraction of waste is not covered in Annex IX, as it would not fit the definition of biofuels/biogas.
	Ligno-cellulosic crops or fraction of crops	Energy cane Energy crops and grasses (incl. Virginia mallow) Grass pulp Bagasse	Yes	No	Already covered in Annex IXA parts c), j) or p).	<b>Do not include in shortlist</b>	
	Cyanobacteria	<i>Arthrospira platensis</i>	Yes	No	Not covered in Annex IX.	<b>Do not include in shortlist</b>	No evidence or documentation provided during consultation. Limited interest from stakeholders.

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	End-of-life Tyres		Yes (Biogenic fraction)	No	Not covered in Annex IX.	<b>Take to a second round of consultation</b>	Additional evidence required that the use of oil derived from EOL tyres for energy recovery is the only use at present. If this is case, these will be considered covered in Annex IXA part d).
	Humins	Residues from bio-based FDCA	Yes	No	Insufficient evidence of coverage in Annex IX part d).	<b>Take to a second round of consultation</b>	If energy recovery appears as the only realistic use, it will be considered covered under Annex IXA-part d)
	Recycled/waste wood	Wood from demolition and construction waste	Yes	No	Already covered in Annex IX A part (q).	<b>Do not include in shortlist</b>	
	Sea algae		Yes	No	Not covered in Annex IX. Only algae cultivated on land (open ponds/PBRs) are included in Annex IX.	<b>Do not include in shortlist</b>	No evidence or documentation provided during consultation. Limited interest from stakeholders.
	Spent bleaching earth		Yes (Biogenic fraction)	No	Already covered in Annex IX A part d).	<b>Do not include in shortlist</b>	Bleaching earth per se is not biomass, but may contain some. The earth part has no energy content
	Waste biogenic CO2 and CO2 from Direct Air capture		No	No	Not covered in Annex IX.	<b>Do not include in shortlist</b>	Biogenic CO2 does not fit the definition of biomass since it is not biodegradable. Furthermore, it is not an energy carrier. Therefore CO2-derived fuels qualify either as Renewable Fuels from Non-Biological Origins (RFNBOs) or Recycled Carbon Fuels (RCFs).

**ANNEX IX (Current list)**

**Part A.** Feedstocks for the production of biogas for transport and advanced biofuels, the contribution of which towards the minimum shares referred to in the first and fourth subparagraphs of Article 25(1) may be considered to be twice their energy content:

- (a) Algae if cultivated on land in ponds or photobioreactors;
- (b) Biomass fraction of mixed municipal waste, but not separated household waste subject to recycling targets under point (a) of Article 11(2) of Directive 2008/98/EC;
- (c) Biowaste as defined in point (4) of Article 3 of Directive 2008/98/EC from private households subject to separate collection as defined in point (11) of Article 3 of that Directive;
- (d) Biomass fraction of industrial waste not fit for use in the food or feed chain, including material from retail and wholesale and the agro-food and fish and aquaculture industry, and excluding feedstocks listed in part B of this Annex;
- (e) Straw;
- (f) Animal manure and sewage sludge;
- (g) Palm oil mill effluent and empty palm fruit bunches;
- (h) Tall oil pitch;
- (i) Crude glycerine;
- (j) Bagasse;
- (k) Grape marcs and wine lees;
- (l) Nut shells;
- (m) Husks;
- (n) Cobs cleaned of kernels of corn;
- (o) Biomass fraction of wastes and residues from forestry and forest-based industries, namely, bark, branches, pre-commercial thinnings, leaves, needles, tree tops, saw dust, cutter shavings, black liquor, brown liquor, fibre sludge, lignin and tall oil;
- (p) Other non-food cellulosic material;
- (q) Other ligno-cellulosic material except saw logs and veneer logs.

**Part B.** Feedstocks for the production of biofuels and biogas for transport, the contribution of which towards the minimum share established in the first subparagraph of Article 25(1) shall be limited and may be considered to be twice their energy content:

- (a) Used cooking oil;
- (b) Animal fats classified as categories 1 and 2 in accordance with Regulation (EC) No 1069/2009.



### Relevant RED II Definitions

**'Biomass'** means the biodegradable fraction of products, waste and residues from biological origin from agriculture, including vegetal and animal substances, from forestry and related industries, including fisheries and aquaculture, as well as the biodegradable fraction of waste, including industrial and municipal waste of biological origin;

**'Food and feed crops'** means starch-rich crops, sugar crops or oil crops produced on agricultural land as a main crop excluding residues, waste or ligno-cellulosic material and intermediate crops, such as catch crops and cover crops, provided that the use of such intermediate crops does not trigger demand for additional land;

**'Ligno-cellulosic material'** means material composed of lignin, cellulose and hemicellulose, such as biomass sourced from forests, woody energy crops and forest-based industries' residues and wastes;

**'Non-food cellulosic material'** means feedstock mainly composed of cellulose and hemicellulose, and having a lower lignin content than ligno-cellulosic material, including food and feed crop residues, such as straw, stover, husks and shells; grassy energy crops with a low starch content, such as ryegrass, switchgrass, miscanthus, giant cane; cover crops before and after main crops; ley crops; industrial residues, including from food and feed crops after vegetal oils, sugars, starches and protein have been extracted; and material from biowaste, where ley and cover crops are understood to be temporary, short-term sown pastures comprising grass-legume mixture with a low starch content to obtain fodder for livestock and improve soil fertility for obtaining higher yields of arable main crops;

**'Residue'** means a substance that is not the end product(s) that a production process directly seeks to produce; it is not a primary aim of the production process and the process has not been deliberately modified to produce it;