

WASTES, RESIDUES AND CO-PRODUCTS FOR BIOFUELS AND BIOLIQUIDS

BACKGROUND

Neither RED nor FQD contains definitions for wastes, residues, or co-products.¹

Yet the Renewable Energy Directive and Fuel Quality Directive (hereinafter “RED-FQD”) provide disparate treatment for the raw material depending on whether it is classified as a waste, residue or co-product. This treatment has implications for the amount of energy counted toward the target, applicability of sustainability criteria and GHG accounting. Although the *Communication on the Practical Implementation of the EU Biofuels and Bioliquids Sustainability Scheme and on Counting Rules for Biofuels*, published in June 2010, sets out some additional considerations when determining whether a raw material is a waste, residue or co-product, there is still much uncertainty.²

The COM proposal, published in October 2012, also misses the mark. Although it does attempt to define waste for the first time, the definition is neither adapted to the biofuels context nor in conformity with waste legislation. It also leaves residues and co-products undefined, instead opting just to include an incomplete list of raw materials in an annex without description or clarification. This briefing note examines the treatment of waste, residues and co-products for biofuels and bioliquids within RED-FQD and the issues typically associated with their use.

WASTES

RED-FQD provides preferential treatment to wastes:

1. Wastes need only meet the GHG savings criterion.³
2. For purposes of the GHG-savings criterion, wastes are “considered to have zero life-cycle greenhouse gas emissions up to the process of collection of those materials,”⁴ meaning no land-use (including soil carbon) emissions.

For purposes of demonstrating compliance with the 10% target, the “contribution made by biofuels produced from wastes... shall be considered to be twice that made by other biofuels.”⁵ RED-FQD does not define wastes but the *Communication from the Commission on the Practical Implementation of the EU Biofuels and Bioliquids Sustainability Scheme and on Counting Rules for Biofuels* states that the concept “should be interpreted in line with the objectives” of RED-FQD.⁶

The COM proposal on ILUC defines waste for the first time. As an amendment to RED only, it references the definition in the Waste Framework Directive (WFD), which defines “waste” as “any substance or object which the holder discards or intends or is required to discard,”⁷ stating in pertinent part:

“waste” shall be defined as in Article 3(1) of Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives. Substances that have been intentionally modified or contaminated to meet that definition are not covered by this category.⁸

For purposes of RED, this definition is supplemented by the requirement that substances cannot be “intentionally modified or contaminated” to meet the definition, which is intended to prevent the practice of “adding waste material to a material that was not waste” in order to make it waste.⁹

The definition of waste requires further refinement. While the definition is a welcome contribution, it does not prevent the use of substances before the end of their useful lifetime. For example, used cooking oil requires no technological developments for exploitation¹⁰ and is subject to ever-increasing imports from abroad. Concerns have arisen about used cooking oil being diverted toward biofuel production before it reaches the end of its useful lifetime especially since, as soon as countries implemented double-counting for these types of biofuels, their consumption sky-rocketed. In the UK, for example, used cooking oil now represents 50% of biodiesel consumption.¹¹ Any artificial increase in demand for cooking oil increases demand for oil crops to produce more cooking oil – with associated land-use implications.

The solution to the unused-cooking-oil problem can be addressed. For example, ensuring wastes conform to the waste hierarchy would require *prevention*, *preparation for re-use* and *recycling* before *recovery* for energy purposes.¹² In the European Union, wastes are already subject to extensive treatment, namely through WFD and in national waste management plans in Member States. Article 4 of WFD establishes a priority order for waste prevention and management, referred to as the waste hierarchy, outlining when waste is appropriate for “other recovery,” i.e. use as raw materials for biofuel production.¹³



“Recovery” refers to operations where the waste replaces materials that would otherwise have been used to fulfill a particular function in the plant or in the wider economy, such as oil as a fuel in transportation.¹⁴ Annex II of WFD sets out a non-exhaustive list of recovery operations, and specifically includes “use principally as a fuel or other means to generate energy.”¹⁵

Member States may only depart from the waste hierarchy for specific waste streams where justified by lifecycle thinking on overall impacts of the generation and management of such waste.¹⁶ Observing the waste hierarchy corresponds with RED-FQD objectives and complements existing Union policies on waste prevention and management. Since the waste hierarchy is only applicable in the Union, the definition of “wastes” should be modified to apply this requirement for wastes originating abroad or otherwise include language in the definition that achieves the same result. In both instances, whether the wastes originate abroad or within the Union, adequate assurances should be required to prevent circumvention.

Drawing from the COM proposal and other literature, an indicative list of wastes for use as raw materials in biofuel production derived from includes:

- Used cooking oil;
- Biomass fraction of mixed municipal waste, but not separated household waste subject to recycling targets under Article 11(2)(a) of Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives;
- Biomass fraction of industrial waste; and
- Sewage sludge.

RESIDUES

RED-FQD provides differential treatment to sub-categories of residues and co-products.¹⁷ Residues are divided into four main sub-categories: agricultural, forestry, aquaculture and fisheries, and processing. The sub-category a residue falls in determines the sustainability criteria it must meet and how the GHG savings criterion is calculated, which is further impacted by whether the residue is considered a co-

product. For these reasons, determining the sub-category of a residue and whether it is a co-product has significant implications. RED-FQD provides little guidance on how to categorize residues or how to determine their status as a co-product, creating loopholes and uncertainty.

The COM proposal suffers from the same shortcomings. It contains no additional guidance to determine in which sub-category a residue belongs, and no definitions or indicative lists for residues and co-products despite purporting to establish the regulatory framework that will operate through 2020, i.e. capping food-based crops and promoting so-called second generation biofuels (wastes and residues) through double- and quadruple-counting. It should also be noted that second-generation biofuels compete with renewable heating, cooling and electricity needed to meet the 20% target in addition to the oleochemical industry and animal husbandry, which uses agricultural residues and animal fats as feed.

I. Agricultural Residues

RED-FQD accords “agricultural residues” the following treatment:

1. Agricultural residues must meet all sustainability criteria.¹⁸
2. For purposes of the GHG-savings criterion, agricultural residues are “considered to have zero life-cycle greenhouse gas emissions up to the process of collection of those materials,”¹⁹ meaning no emissions from cultivation and land-use change.

It is unclear under RED-FQD what constitutes an agricultural residue. Residues from agriculture are sometimes considered agricultural residues, sometimes processing residues and sometimes co-products.

In general, there are two types of agricultural residues – primary agricultural residues produced when harvesting crops, such as straw and stover,²⁰ and secondary agricultural residues produced during the processing of crops into food or other products, such as nutshells and bagasse.²¹ Both primary and secondary agricultural residues have alternative uses to biofuel production so there is an opportunity cost to their use. Diverting agricultural residues already used for another purpose, such as animal feed or torrefaction pellets, results in additional land to replace them. Encouraging the use of unused primary agricultural residues otherwise left on the land decreases soil quality and results in additional fertilizer use. The COM proposal does not address agricultural residues in any meaningful way.

Drawing from the COM proposal and other literature, an indicative list of agricultural residues includes:

- Straw;
- Stover, husks and cobs;
- Palm oil mill effluent;
- Presscake, including rape seed cake and soybean cake;
- Marcs and lees, including grapes, olives and other fruits;
- Bagasse;
- Palm kernel meal; and
- Empty fruit bunches and nutshells.

II. Forestry Residues

RED-FQD accords “forestry residues” the following treatment:²²

1. Forestry residues must meet all sustainability criteria.
2. For purposes of the GHG savings criterion, there is no unique treatment.²³

It is not always clear under RED-FQD what constitutes forestry residue. Residues from forestry may sometimes be considered forestry residues, sometimes processing residues and sometimes co-products.

In general, there are two types of forestry residues – primary forestry residues produced when harvesting timber, such as treetops, branches and stumps,²⁴ and secondary forestry residues produced during

processing of biomass-based materials or products, such as sawdust, bark and scrapwood.²⁵ All have alternative uses to biofuel production. Diverting forestry residues already used for another purpose, such as wood pellets for energy or by paper industry, will result in additional biomass extraction to replace them. Encouraging use of unused primary forestry residues otherwise left on the land causes loss of organic matter, soil carbon and habitat for biodiversity.

Forestry residues are subject to sustainability criteria that were not designed for them. RED-FQD does not contain a specific sustainability scheme for forestry residues. Instead the sustainability criteria were adopted for agricultural products and residues, which were expected to be the predominant raw materials for biofuel production. This is evident in the focus on preventing direct land-use change—new agricultural cultivation almost always requires land conversion—whereas forestry products and residues are typically harvested in the absence of direct land-use change as forests are thinned or residues salvaged, resulting in degraded forests but not always deforested ones. Thus sustainable management is essential.

RED required the Commission to report “on requirements for a sustainability scheme for energy uses of biomass, other than biofuels and bioliquids, by 31 December 2009” and, where appropriate, to submit proposals for a sustainability scheme for forest biomass, in particular:²⁶

If the analysis done for that purpose demonstrates that it would be appropriate to introduce amendments, in relation to forest biomass, in the calculation methodology in Annex V or in the sustainability criteria relating to carbon stocks applied to biofuels and bioliquids, the Commission shall... make proposals to the European Parliament and Council at the same time in this regard.

Had the Commission fulfilled its legislative mandate there, forest residues for biofuel production could have relied upon that sustainability scheme. Instead, the Commission published in February 2010 its *Report on Sustainability Requirements of the Use of Solid and Gaseous Biomass Sources in Electricity, Heating and Cooling*.²⁷ There, the Commission analyzed several issues related to a sustainability scheme, acknowledging the need for public intervention when intensified use of forest biomass leads to environmental risks during production and consumption but declined to take action.²⁸ This was despite the legislative mandate to do so where appropriate – an eerie foreshadowing of similar disregard of the legislative mandate to include ILUC factors in RED-FQD.²⁹ Given that the internal Commission dynamic appears incapable of addressing sustainability issues in a responsible manner, in the absence of sustainability scheme for forest biomass the responsibility falls upon Parliament and the Council. In particular where, as here, the COM proposal incentivizes the use forestry residues for biofuel production that compete with energy production for scarce forestry resources, a sustainability scheme for forest biomass should be established – and many examples exist.³⁰

Drawing from the COM proposal and other literature, an indicative list of forestry residues includes:

- Treetops;
- Branches;
- Stumps
- Leaves
- Sawdust;
- Cutter shavings and scrapwood; and
- Wood pulp.

III. Aquaculture and Fisheries Residues

RED-FQD accords aquaculture and fisheries residues the following treatment:

1. Aquaculture and fisheries residues must meet all sustainability criteria.

2. For purposes of the GHG-savings criterion, these residues are not allowed to use the default values in Part A of Annex IV nor the disaggregated default values for cultivation in Part D of Annex IV.³¹ Actual values must be used.³²

RED-FQD only considers primary aquaculture and fisheries residues—those directly produced by aquaculture and fisheries—as aquaculture and fisheries residues and not those related to the processing of aquaculture and fisheries products, i.e. those at processing sites.³³ This distinction, however, is very unclear. At the moment, aquaculture and fisheries residues have uncertain market penetration and suffer from a lack of information.

Drawing from the COM proposal and other literature, an indicative list of aquaculture and fisheries residues should be drawn up to include:

- Algae; and
- Fish scales, viscera and scrap.

IV. Processing Residues

RED-FQD considers as processing residues those residues concentrated at processing sites, according them the following treatment:

1. Processing residues need only meet the GHG savings criterion.
2. For purposes of the GHG-savings criterion, processing residues shall be considered to have zero life-cycle greenhouse gas emissions up to the process of collection of those materials.³⁴

The *Communication on the Practical Implementation of the EU Biofuels and Bioliquids Sustainability Scheme and on Counting Rules for Biofuels* defines processing residues as 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.”³⁵ But this definition is vague, not always providing a sufficient basis to distinguish among other residues and processing residues.

The COM proposal fails to address issues associated with processing residues. In large part, this is because of the unclear definitions and categories. Assuming agricultural, forestry, aquaculture and fisheries residues are treated as recommended above, processing residues would then include those residues from *processing*, i.e. agricultural, forestry, aquaculture and fisheries residues (whether primary or secondary) as well as animal and municipal solid waste and post-consumer biomass products (although the animal and municipal solid waste and post-consumer biomass products themselves are considered waste). In this instance, exempting processing residues from the sustainability criteria related to land-use could be justifiable at this juncture.

Drawing from the COM proposal and other literature, an indicative list of processing residues includes:

- Crude glycerine;
- Tall oil pitch;
- Animal fats classified as category I and II in accordance with EC/1774/2002 laying down health rules concerning animal by-products not intended for human consumption.

CO-PRODUCTS

RED-FQD considers some raw materials to be co-products, according them the following treatment:

1. Co-products must meet all the sustainability criteria.

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2. For purposes of the GHG-savings criterion, co-products are apportioned emissions based on the energy-allocation method, which divides emissions among co-products according to their energy content.³⁶

The COM proposal does not define co-products. But whether a residue is considered one has implications for how GHG emissions are accounted for that residue.

In general, to prevent exploiting loopholes, co-products should be considered all raw materials that are typically co-products—because of market value and alternative uses, such as the case of agricultural and forestry residues—or materials that constitute a considerable outcome of a process in terms of economic value. In all instances where the main process has been deliberately modified to produce a larger quantity or another quality of the material at the expense of the main product then it is a co-product.

This approach would ensure that emissions are adequately apportioned to residues that are actually co-products—based on the energy-allocation method—and this could include emissions from cultivation and land-use change, where applicable.

Drawing from the COM proposal and other literature, an indicative list of co-products includes:

- Agricultural residues (primary and secondary);
- Forestry residues (primary and secondary);
- Animal fats classified as category III in accordance with EC/1774/2002 laying down health rules concerning animal by-products not intended for human consumption; and
- Animal manure.

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¹ See generally Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC [hereinafter “FQD” for Fuel Quality Directive]; Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC [hereinafter “RED” for Renewable Energy Directive].

² Communication from the Commission on the Practical Implementation of the EU Biofuels and Bioliqids Sustainability Scheme and on Counting Rules for Biofuels, O.J. LC 160/8.

³ RED, Article 17(1); FQD, Article 7b.

⁴ FQD, Annex IV(C)(18); see also FQD, Article 7d(3).

⁵ RED, Article 21(2).

⁶ European Commission, *Communication from the Commission on the Practical Implementation of the EU Biofuels and Bioliqids Sustainability Scheme and on Counting Rules for Biofuels*, the Commission (19 June 2010), p. C 160/13.

⁷ Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives [hereinafter “WFD” for Waste Framework Directive], Article 3(1).

⁸ Commission ILUC proposal, Article 2(1).

⁹ Commission Communication on Biofuel Implementation, p. C 160/13.

¹⁰ European Commission, *Impact Assessment accompanying the document Proposal for a Directive of the European Parliament and of the Council amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources*, SWD(2012)0343 [hereinafter “Impact Assessment”], p. 123.

¹¹ United Kingdom, *RTFO Quarterly Report 12* (15 April 2010 – 15 April 2011), p. 5 available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/11502/rtfoaug2011.pdf

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- ¹² WFD, Article 4(1).
- ¹³ WFD, Article 4(1).
- ¹⁴ WFD, Article 3(15).
- ¹⁵ WFD, Article 3(15) and Annex II.
- ¹⁶ WFD, Article 4(2).
- ¹⁷ European Commission, *Communication from the Commission on the Practical Implementation of the EU Biofuels and Bioliqids Sustainability Scheme and on Counting Rules for Biofuels*, the Commission (19 June 2010), p. C 160/13.
- ¹⁸ FQD, 7b(1); RED, Article 17(1).
- ¹⁹ FQD, Annex IV(C)(18); see also FQD, Article 7d(3).
- ²⁰ International Energy Agency, *Sustainable Production of Second-Generation Biofuels: Potential and Perspectives in Major Economies and Developing Countries* (Information Paper, February 2010), pp. 41-43.
- ²¹ International Energy Agency, *Sustainable Production of Second-Generation Biofuels: Potential and Perspectives in Major Economies and Developing Countries* (Information Paper, February 2010), p. 43.
- ²² International Energy Agency, *Sustainable Production of Second-Generation Biofuels: Potential and Perspectives in Major Economies and Developing Countries* (Information Paper, February 2010), pp. 41-43.
- ²³ FQD, 7b(1); RED, Article 17(1).
- ²⁴ International Energy Agency, *Sustainable Production of Second-Generation Biofuels: Potential and Perspectives in Major Economies and Developing Countries* (Information Paper, February 2010), pp. 41-43.
- ²⁵ International Energy Agency, *Sustainable Production of Second-Generation Biofuels: Potential and Perspectives in Major Economies and Developing Countries* (Information Paper, February 2010), p. 43.
- ²⁶ RED, Article 17(9).
- ²⁷ European Commission, *Report from the Commission to the Council and the European Parliament on Sustainability Requirements for the Use of Solid and Gaseous Biomass Sources in Electricity, Heating and Cooling; Commission Staff Working Document Impact Assessment: Accompanying Document to the Report from the Commission to the Council and the European Parliament on Sustainability Requirements for the Use of Solid and Gaseous Biomass Sources in Electricity, Heating and Cooling*, COM(2010) 11 final.
- ²⁸ European Commission, *Commission Staff Working Document Impact Assessment: Accompanying Document to the Report from the Commission to the Council and the European Parliament on Sustainability Requirements for the Use of Solid and Gaseous Biomass Sources in Electricity, Heating and Cooling*, COM(2010) 11 final, pp. 7-9.
- ²⁹ RED, Recital 85 and Article 19(6); FQD, Article 7d(6); see also *Commission Staff Working Document: Impact Assessment Accompanying the Document Proposal for a Directive of the European Parliament and of the Council Amending Directive 98/70/EC relating to the Quality of Petrol and Diesel Fuels and Amending Directive 2009/28/EC on the Promotion of the Use of Energy from Renewable Sources*, COM(2012) 595 final, p. 29 (Commission asserts its right of initiative to disregard the intent of Parliament and the Council to develop and include a methodology for capturing ILUC emissions in RED-FQD).
- ³⁰ See e.g. Défense Terre, *Sustainability Scheme for Wood Fuels: Overview of Options* (Working Document, October 2011).
- ³¹ FQD, Article 7d(3).
- ³² FQD, Article 7d(3).
- ³³ European Commission, *Communication from the Commission on the Practical Implementation of the EU Biofuels and Bioliqids Sustainability Scheme and on Counting Rules for Biofuels*, the Commission (19 June 2010), p. C 160/10.
- ³⁴ RED, Annex V(18).
- ³⁵ European Commission, *Communication from the Commission on the Practical Implementation of the EU Biofuels and Bioliqids Sustainability Scheme and on Counting Rules for Biofuels*, p. C 160/13.
- ³⁶ RED, Recital 81 and Annex V(C)(16)-(18); see also *The Communication on the Practical Implementation of the EU Biofuels and Bioliqids Sustainability Scheme and on Counting Rules for Biofuels*, p. 160/16.