



Growing Demand for Waste and Residues from Palm and Implications

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ISCC Technical Committee Southeast Asia, Kuala Lumpur, 24 October 2018

Outline

Definition of Wastes & Residues from the EU perspective

The legal framework

- RED II
- Power of the Member States
- How ISCC can help

Palm based wastes& residues- New? Growing? Why? Markets?

Challenges & Opportunities

Waste: Material that is to be discarded (e.g. to a landfill)

- **“Any substance or object which the holder discards or intends or is required to discard”***
 - Raw materials or substances that have been intentionally produced, modified or contaminated to count as waste under this definition do not qualify as waste
 - The concept of ”discarding” a material according to the WFD requires consideration of all relevant circumstances at the point of origin of a material
- **Examples (no explicit reference in the RED):**
 - Palm Oil Mill Effluent (POME)
 - Used Cooking Oil (UCO)
 - Spent Bleaching Earth (SBE)
 - Waste Wood

* Definition according to Art. 3 (1) of EU Waste Framework Directive (WFD)





Residues from agriculture, aquaculture, fisheries and forestry

- **General Definition “Residues”:**
 - “Substances not being the end product(s) that a production process directly seeks to produce”
- **Residues directly deriving from or generated by agriculture, aquaculture, fisheries, forestry**
 - Do not include residues from related industries or processing
 - Must comply with the sustainability requirements for cultivation (certification up to and including the farm or plantation / regular ISCC certification process)
 - Zero GHG emissions for cultivation
- **Examples (explicitly mentioned in the RED):**
 - Straw
 - Bagasse
 - Nut Shells

* Definition according to Art. 3 (1) of EU Waste Framework Directive (WFD)

Processing Residues



- **General Definition “Residues”:**
 - “Substances not being the end product(s) that a production process directly seeks to produce”
- **“Processing Residues:**
 - Production of the substance is not the primary aim of the production process and the process has not been deliberately modified to produce it
 - Do not need to comply with the sustainability requirements for cultivation of biomass (certification does not start at the farm or plantation / ISCC waste/residue certification process)
 - Zero GHG emissions up to the point of collection
- **Examples (explicitly mentioned in the RED):**
 - Crude Glycerine (Glycerine that is not refined)
 - Tall Oil Pitch

* Definition according to Art. 3 (1) of EU Waste Framework Directive (WFD)

EU Member States are responsible for the national framework for waste and residues

- MS decide individually which materials are classified as waste/residues
- Double-counting for waste/residue based biofuels in some MS (e.g. UK, NL)
- National “double counting schemes” in addition to voluntary schemes (e.g. Dutch Double Counting, Italian Double Counting)
- “Positive lists” (not necessarily harmonized, i.e. material may be considered as waste/residue in one MS as a product in another)
- Certification and documentation requirements not harmonized
- Multiple Certification may be required

POME and EFBs are specifically included in Annex IX of the preliminary REDII agreement

Annex IX of RED II	
Part A (“Advanced”)	
<ul style="list-style-type: none"> 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 c) Bio-waste as defined in Article 3(4) of Directive 2008/98/EC from private households subject to separate collection 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 e) Straw f) Animal manure and sewage sludge g) Palm oil mill effluent and empty palm fruit bunches h) Tall oil pitch 	<ul style="list-style-type: none"> 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, i.e. 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 (Not considered as “advanced”)	
<ul style="list-style-type: none"> a) Used Cooking Oil (UCO) 	<ul style="list-style-type: none"> b) Animal fats categories 1 and 2

Source: RED II Compromise (2016/0382) as of 21 June 2018



Lists of material eligible for ISCC EU certification
(10 October 2018)

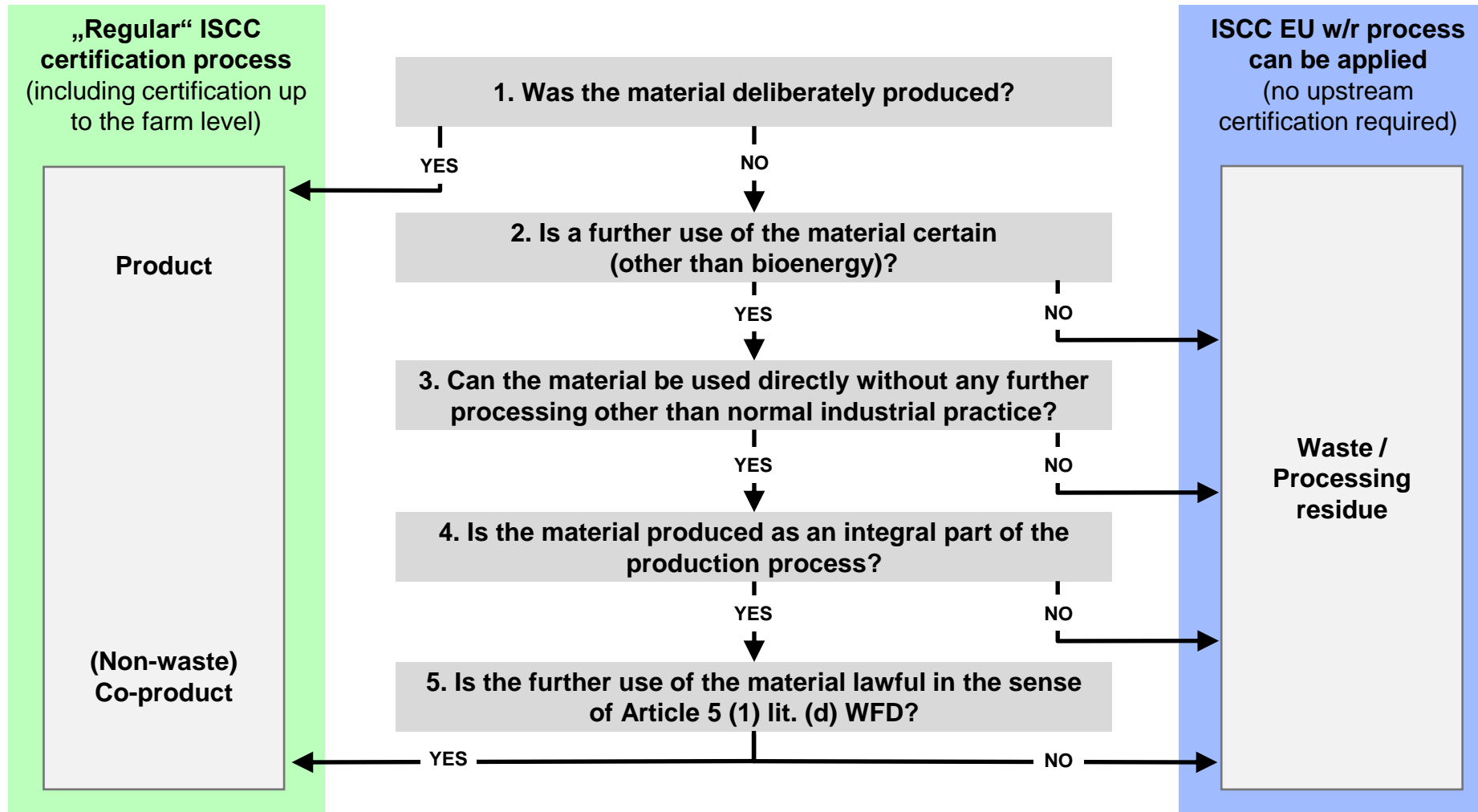
Table 1: Raw material

Declaration of material on ISCC EU certificate	Additional information	Classified as waste/residue material in the following EU Member States
Nut shells (specification of nut)	Agricultural crop residue acc. to RED	
Oat		
Oil palm fresh fruit bunches (FFBs)		
Organic municipal solid waste (MSW) *	Only the biomass portion of MSW	UK, NL
Palm Fatty Acid Distillate (PFAD) **	As PFAD has a significant economic value in relation to the main product (palm oil) and a variety of applications (other than bioenergy), several EU Member States explicitly classify PFAD as a co-product (e.g. UK, NL)	
Palm kernel		
Palm oil mill effluent (POME) *	POME is a waste water/sludge arising from palm oil production usually released to open ponds. The oil extracted from POME is often referred to as „Palm Sludge Oil“ or „Sludge Palm Oil“	UK, NL, FI, IE

ISCC list of materials: Information on the waste/residue classification is included

- If a MS officially recognizes a material as waste/residue eligible for biofuel production, the ISCC waste/residue process can be applied
- Acceptance depends on the individual MS requirements (MS regulations take precedence)
- Materials which are not published on the ISCC list cannot be certified
- Materials can be considered on request:
 - ISCC to be contacted
 - Evidence shall be provided to ISCC that the material is officially recognized as waste/residue in a MS
- For some material a case-by-case assessment is required to distinguish between co-products and processing residues (e.g. PFAD)

ISCC process to distinguish if the ISCC EU waste/residue certification process can be applied (individual assessment at Point of Origin)

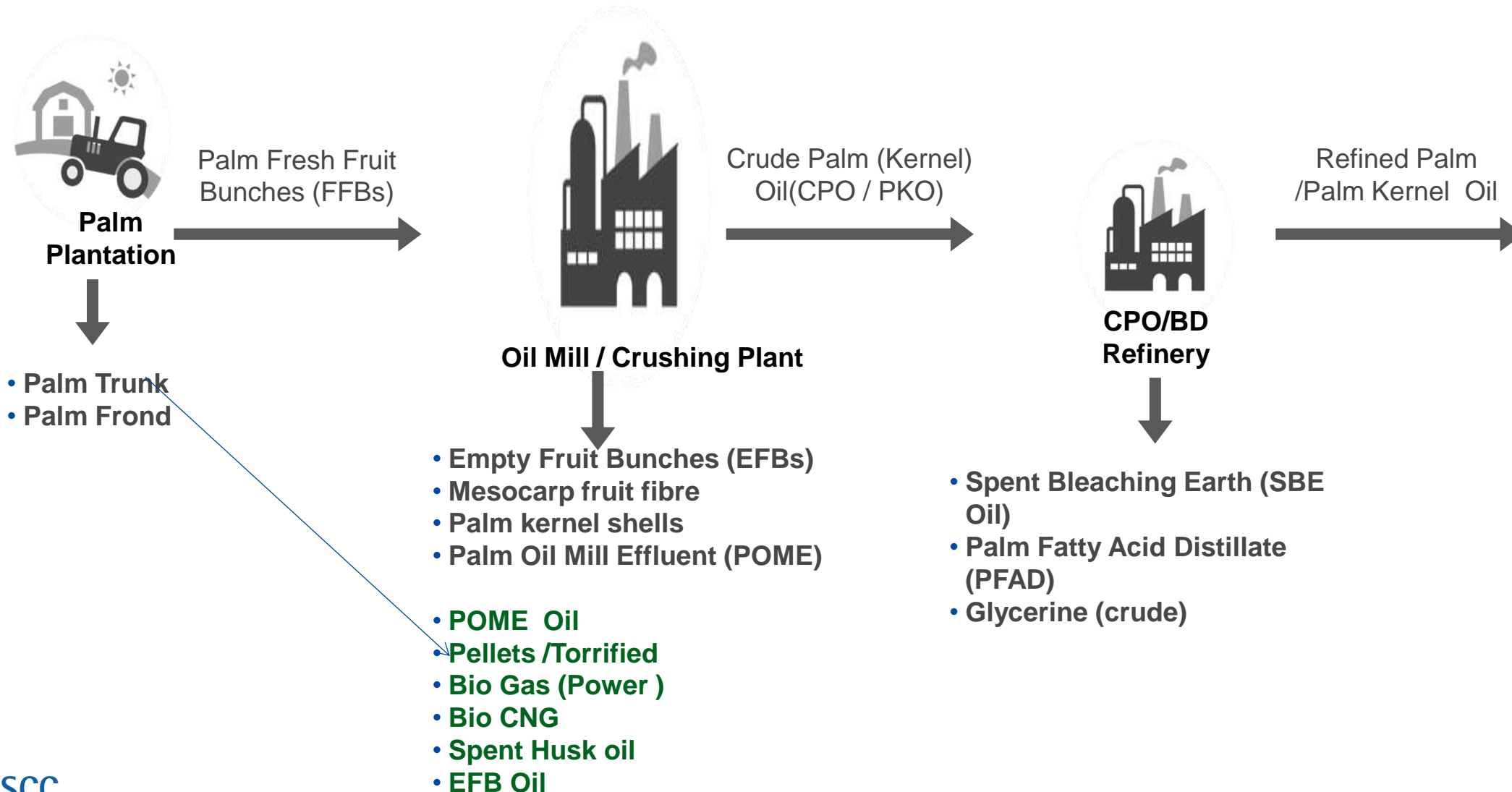


Decision tree based on: EC DG Environment 2012: „Guidance on the interpretation of key provisions of Directive 2008/98/EC on waste“; (Directive 2008/98/EC: Waste Framework Directive – WFD)

The catalyst for growth:

- * Palm industry faces rising costs, lower margins
- * increasing pressure to manage its wastes
- * Creating more value per hectare improves the bottom line & the sustainability score
- * Legislative developments in EU supporting W&R/Low iluc risks biofuels

Palm supply chain: Not all outputs from the palm process are consistently classified (e.g. PFAD)



(New?) Types of Palm Waste

POME Oil (Palm Effluent Sludge Oil) -

- **With its classification as feedstock for advanced biofuels, demand is set to grow**
- **Estimates of its availability vary widely, (500,000 tons – 2.5 mln tons)**
- **apprehension that attractive pricing may encourage deliberate creation of waste – (fraud ?)**

EFB Oil

- **removal of water from wet EFB is necessary before it can be effectively pelletised.**
- **the water so removed contains residual oil which can be (economically ?) extracted**
- **dewatering is necessary for the production of long fibre.**
- **Long fibre market is mainly China, EFB oil possibly EU.**

Spent Husk Oil

- **the mesocarp contains residual oil.**
- **This can be extracted economically , if there is demand for short fibre.**
- **So far not usable in Biodiesel, but this can change**

New (?)Types of Palm Waste

-Biogas – to produce power & supply and feed into the Grid

-Compressed Biogas- to supply into the transport fuel market- Pilot in process

- Pellets – (non Torrified/Torrified)- small but growing export volume to East Asian markets.

Challenges & Opportunities:

- Very high Capex/ROI
- Market & Sustained offtake
- Meeting Sustainability Requirements/
- Negative Palm image



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