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ANNEXES 1 to 2

## **ANNEXES**

**to the**

**Proposal for a**

**DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL  
amending Directive (EU) 2018/2001 of the European Parliament and of the Council,  
Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive  
98/70/EC of the European Parliament and of the Council as regards the promotion of  
energy from renewable sources, and repealing Council Directive (EU) 2015/652**

{SEC(2021) 657 final} - {SWD(2021) 620 final} - {SWD(2021) 621 final} -  
{SWD(2021) 622 final}

## ANNEX I

The Annexes to Directive (EU) 2018/2001 are amended as follows:

- (1) in Annex I, the final row in the table is deleted;
- (2) the following Annex 1a is inserted:

*‘ANNEX 1a*

**NATIONAL HEATING AND COOLING SHARES OF ENERGY FROM RENEWABLE SOURCES IN GROSS FINAL CONSUMPTION OF ENERGY FOR 2020-2030**

	<b>Baseline shares increase (in percentage. points) (REF20/NECPs)</b>	<b>Resulting renewable heating and cooling shares in 2030 in percentage points including top ups (at least)</b>
<b>Belgium</b>	0,3%	1,4%
<b>Bulgaria</b>	0,9%	1,4%
<b>Czech Republic</b>	0,5%	1,4%
<b>Denmark</b>	0,9%	1,4%
<b>Germany</b>	0,9%	1,5%
<b>Estonia</b>	1,2%	1,5%
<b>Ireland</b>	2,1%	2,9%
<b>Greece</b>	1,6%	2,0%
<b>Spain</b>	1,1%	1,4%
<b>France</b>	1,4%	1,8%
<b>Croatia</b>	0,7%	1,4%
<b>Italy</b>	1,2%	1,6%
<b>Cyprus</b>	0,5%	1,6%
<b>Latvia</b>	0,8%	1,0%
<b>Lithuania</b>	1,6%	2,0%
<b>Luxembourg</b>	2,0%	2,7%
<b>Hungary</b>	0,9%	1,5%

<b>Malta</b>	0,5%	1,5%
<b>Netherlands</b>	0,7%	1,4%
<b>Austria</b>	0,7%	1,5%
<b>Poland</b>	1,0%	1,5%
<b>Portugal</b>	1,0%	1,4%
<b>Romania</b>	0,6%	1,4%
<b>Slovenia</b>	0,7%	1,4%
<b>Slovakia</b>	0,3%	1,4%
<b>Finland</b>	0,5%	0,8%
<b>Sweden</b>	0,3%	0,6%

(3) Annex III is replaced by the following:

#### ENERGY CONTENT OF FUELS

Fuel	Energy content by weight (lower calorific value, MJ/kg)	Energy content by volume (lower calorific value, MJ/l)
<b>FUELS FROM BIOMASS AND/OR BIOMASS PROCESSING OPERATIONS</b>		
Bio-Propane	46	24
Pure vegetable oil (oil produced from oil plants through pressing, extraction or comparable procedures, crude or refined but chemically unmodified)	37	34
Biodiesel - fatty acid methyl ester (methyl-ester produced from oil of biomass origin)	37	33
Biodiesel - fatty acid ethyl ester (ethyl-ester produced from oil of biomass origin)	38	34
Biogas that can be purified to natural gas quality	50	—
Hydrotreated (thermochemically treated with hydrogen) oil of biomass origin, to be used for replacement of diesel	44	34

Hydrotreated (thermochemically treated with hydrogen) oil of biomass origin, to be used for replacement of petrol	45	30
Hydrotreated (thermochemically treated with hydrogen) oil of biomass origin, to be used for replacement of jet fuel	44	34
Hydrotreated oil (thermochemically treated with hydrogen) of biomass origin, to be used for replacement of liquefied petroleum gas	46	24
Co-processed oil (processed in a refinery simultaneously with fossil fuel) of biomass or pyrolysed biomass origin to be used for replacement of diesel	43	36
Co-processed oil (processed in a refinery simultaneously with fossil fuel) of biomass or pyrolysed biomass origin, to be used to replace petrol	44	32
Co-processed oil (processed in a refinery simultaneously with fossil fuel) of biomass or pyrolysed biomass origin, to be used to replace jet fuel	43	33
Co-processed oil (processed in a refinery simultaneously with fossil fuel) of biomass or pyrolysed biomass origin, to be used to replace liquefied petroleum gas	46	23
<b>RENEWABLE FUELS THAT CAN BE PRODUCED FROM VARIOUS RENEWABLE SOURCES, INCLUDING BIOMASS</b>		
Methanol from renewable sources	20	16
Ethanol from renewable sources	27	21
Propanol from renewable sources	31	25
Butanol from renewable sources	33	27
Fischer-Tropsch diesel (a synthetic hydrocarbon or mixture of synthetic hydrocarbons to be used for replacement of diesel)	44	34
Fischer-Tropsch petrol (a synthetic hydrocarbon or mixture of synthetic hydrocarbons produced from biomass, to be used for replacement of	44	33

petrol)		
Fischer-Tropsch jet fuel (a synthetic hydrocarbon or mixture of synthetic hydrocarbons produced from biomass, to be used for replacement of jet fuel)	44	33
Fischer-Tropsch liquefied petroleum gas (a synthetic hydrocarbon or mixture of synthetic hydrocarbons, to be used for replacement of liquefied petroleum gas)	46	24
DME (dimethylether)	28	19
Hydrogen from renewable sources	120	—
ETBE (ethyl-tertio-butyl-ether produced on the basis of ethanol)	36 (of which 37 % from renewable sources)	27 (of which 37 % from renewable sources)
MTBE (methyl-tertio-butyl-ether produced on the basis of methanol)	35 (of which 22 % from renewable sources)	26 (of which 22 % from renewable sources)
TAAE (tertiary-amyl-ethyl-ether produced on the basis of ethanol)	38 (of which 29 % from renewable sources)	29 (of which 29 % from renewable sources)
TAME (tertiary-amyl-methyl-ether produced on the basis of methanol)	36 (of which 18 % from renewable sources)	28 (of which 18 % from renewable sources)
THxEE (tertiary-hexyl-ethyl-ether produced on the basis of ethanol)	38 (of which 25 % from renewable sources)	30 (of which 25 % from renewable sources)
THxME (tertiary-hexyl-methyl-ether produced on the basis of methanol)	38 of which 14 % from renewable sources)	30 (of which 14 % from renewable sources)
<b>NON-RENEWABLE FUELS</b>		
Petrol	43	32
Diesel	43	36
Hydrogen from non-renewable sources	120	—

(4) Annex IV is amended as follows:

a) the title is replaced by the following:

**‘TRAINING AND CERTIFICATION OF INSTALLERS AND DESIGNERS OF RENEWABLE INSTALLATIONS’**

- b) the introductory sentence and the first point are replaced by the following:

‘The certification schemes and training programmes referred to in Article 18(3) shall be based on the following criteria:

1. The certification process shall be transparent and clearly defined by the Member States or by the administrative body that they appoint.’;

- c) The following points 1a and 1b are inserted:

‘1a. The certificates issued by certification bodies shall be clearly defined and easy to identify for workers and professionals seeking certification.

1b. The certification process shall enable installers to put in place high quality installations that operate reliably.’;

- d) Points 2 and 3 are replaced by the following:

‘2. Installers of biomass, heat pump, shallow geothermal, solar photovoltaic and solar thermal energy shall be certified by an accredited training programme or training provider.’

3. The accreditation of the training programme or provider shall be effected by Member States or by the administrative body that they appoint. The accrediting body shall ensure that the training programme offered by the training provider has continuity and regional or national coverage.

The training provider shall have adequate technical facilities to provide practical training, including sufficient laboratory equipment or corresponding facilities to provide practical training.

The training provider shall offer, in addition to the basic training, shorter refresher and upskilling courses organised in training modules allowing installers and designers to add new competences, widen and diversify their skills across several technologies and their combinations. The training provider shall ensure adaptation of training to new renewable technologies in the context of buildings, industry and agriculture. Training providers shall recognise acquired relevant skills.

The training programmes and modules shall be designed to enable life-long learning in renewable installations and be compatible with vocational training for first time job seekers and adults seeking reskilling or new employment.

The training programmes shall be designed in order to facilitate acquiring qualification in different technologies and solutions and avoid limited specialisation in a specific brand or technology. The training provider may be the manufacturer of the equipment or system, institutes or associations.’;

- e) In point 6(c) the following points (iv) and (v) are added :

‘(iv) an understanding of feasibility and design studies;

(v) an understanding of drilling, in the case of geothermal heat pumps.’;

- (5) In Annex V, part C is amended as follows:

- a) points 5 and 6 are replaced by the following:

‘5. Emissions from the extraction or cultivation of raw materials, eec, shall, include emissions from the extraction or cultivation process itself; from the collection, drying and storage of raw materials; from waste and leakages; and from the production of chemicals or products used in extraction or cultivation. Capture of CO<sub>2</sub> in the cultivation of raw materials shall be excluded. If available, the disaggregated default values for soil N<sub>2</sub>O emissions set out in Part D shall be applied in the calculation. It is allowed to calculate averages based on local farming practices based on data of a group of farms, as an alternative to using actual values.’;

6. For the purposes of the calculation referred to in point 1(a), greenhouse gas emissions savings from improved agriculture management, esca, such as shifting to reduced or zero-tillage, improved crop/rotation, the use of cover crops, including crop residue management, and the use of organic soil improver (e.g. compost, manure fermentation digestate), shall be taken into account only if they do not risk to negatively affect biodiversity. Further, solid and verifiable evidence shall be provided that the soil carbon has increased or that it is reasonable to expect to have increased over the period in which the raw materials concerned were cultivated while taking into account the emissions where such practices lead to increased fertiliser and herbicide use<sup>1</sup>.’;

b) point 15 is deleted:

c) point 18 is replaced by the following:

‘18. For the purposes of the calculations referred to in point 17, the emissions to be divided shall be eec + el + esca + those fractions of ep, etd, eccs and eccr that take place up to and including the process step at which a co-product is produced. If any allocation to co-products has taken place at an earlier process step in the life-cycle, the fraction of those emissions assigned in the last such process step to the intermediate fuel product shall be used for those purposes instead of the total of those emissions. In the case of biogas and biomethane, all co-products that do not fall under the scope of point 7 shall be taken into account for the purposes of that calculation. No emissions shall be allocated to wastes and residues. Co-products that have a negative energy content shall be considered to have an energy content of zero for the purposes of the calculation. Wastes and residues including all wastes and residues included in Annex IX shall be considered to have zero life-cycle greenhouse gas emissions up to the process of collection of those materials irrespectively of whether they are processed to interim products before being transformed into the final product. Residues that are not included in Annex IX and fit for use in the food or feed market shall be considered to have the same amount of emissions from the extraction, harvesting or cultivation of raw materials, eec as their closest substitute in the food and feed market that is included in the table in part D. In the case of biomass fuels produced in refineries, other than the combination of processing plants with boilers or cogeneration units

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<sup>1</sup> Measurements of soil carbon can constitute such evidence, e.g. by a first measurement in advance of the cultivation and subsequent ones at regular intervals several years apart. In such a case, before the second measurement is available, increase in soil carbon would be estimated on the basis of representative experiments or soil models. From the second measurement onwards, the measurements would constitute the basis for determining the existence of an increase in soil carbon and its magnitude.

providing heat and/or electricity to the processing plant, the unit of analysis for the purposes of the calculation referred to in point 17 shall be the refinery’;

(6) In Annex VI, part B is amended as follows:

a) points 5 and 6 are replaced by the following:

‘5. Emissions from the extraction or cultivation of raw materials,  $e_{ec}$ , shall, include emissions from the extraction or cultivation process itself; from the collection, drying and storage of raw materials; from waste and leakages; and from the production of chemicals or products used in extraction or cultivation. Capture of CO<sub>2</sub> in the cultivation of raw materials shall be excluded. If available, the disaggregated default values for soil N<sub>2</sub>O emissions set out in Part D shall be applied in the calculation. It is allowed to calculate averages based on local farming practises based on data of a group of farms, as an alternative to using actual values.’

6. For the purposes of the calculation referred to in point 1(a), greenhouse gas emissions savings from improved agriculture management,  $e_{sca}$ , such as shifting to reduced or zero-tillage, improved crop/rotation, the use of cover crops, including crop residue management, and the use of organic soil improver (e.g. compost, manure fermentation digestate), shall be taken into account only if they do not risk to negatively affect biodiversity. Further, solid and verifiable evidence shall be provided that the soil carbon has increased or that it is reasonable to expect to have increased over the period in which the raw materials concerned were cultivated while taking into account the emissions where such practices lead to increased fertiliser and herbicide use<sup>2</sup>;

b) point 15 is deleted:

c) point 18 is replaced by the following:

‘18. For the purposes of the calculations referred to in point 17, the emissions to be divided shall be  $e_{ec} + e_l + e_{sca}$  + those fractions of  $e_p$ ,  $e_{td}$ ,  $e_{ccs}$  and  $e_{ccr}$  that take place up to and including the process step at which a co-product is produced. If any allocation to co-products has taken place at an earlier process step in the life-cycle, the fraction of those emissions assigned in the last such process step to the intermediate fuel product shall be used for those purposes instead of the total of those emissions.

In the case of biogas and biomethane, all co-products that do not fall under the scope of point 7 shall be taken into account for the purposes of that calculation. No emissions shall be allocated to wastes and residues. Co-products that have a negative energy content shall be considered to have an energy content of zero for the purposes of the calculation.

Wastes and residues including all wastes and residues included in Annex IX shall be considered to have zero life-cycle greenhouse gas emissions up

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<sup>2</sup> Measurements of soil carbon can constitute such evidence, e.g. by a first measurement in advance of the cultivation and subsequent ones at regular intervals several years apart. In such a case, before the second measurement is available, increase in soil carbon would be estimated on the basis of representative experiments or soil models. From the second measurement onwards, the measurements would constitute the basis for determining the existence of an increase in soil carbon and its magnitude.



to the process of collection of those materials irrespectively of whether they are processed to interim products before being transformed into the final product. Residues that are not included in Annex IX and fit for use in the food or feed market shall be considered to have the same amount of emissions from the extraction, harvesting or cultivation of raw materials,  $e_{ec}$  as their closest substitute in the food and feed market that is included in the table in part D of Annex V.

In the case of biomass fuels produced in refineries, other than the combination of processing plants with boilers or cogeneration units providing heat and/or electricity to the processing plant, the unit of analysis for the purposes of the calculation referred to in point 17 shall be the refinery'

- (7) in Annex VII, in the definition of ' $Q_{usable}$ ', the reference to Article 7(4) is replaced by a reference to Article 7(3).
- (8) Annex IX is amended as follows:
  - (a) in Part A, the introductory phrase is replaced by the following:  
'Feedstocks for the production of biogas for transport and advanced biofuels:'
  - (b) In Part B, the introductory phrase is replaced by the following:  
'Feedstocks for the production of biofuels and biogas for transport, the contribution of which towards the greenhouse gas emissions reduction target established in Article 25(1), first subparagraph, point (a), shall be limited:';

## ANNEX II

Annexes I, II, IV and V to Directive 98/70/EC are amended as follows:

- (1) Annex I is amended as follows:
  - (a) the text of footnote 1 is replaced by the following:

‘(1) Test methods shall be those specified in EN 228:2012+A1:2017. Member States may adopt the analytical method specified in replacement EN 228:2012+A1:2017 standard if it can be shown to give at least the same accuracy and at least the same level of precision as the analytical method it replaces.’;
  - (b) the text of footnote 2 is replaced by the following:

‘(2) the values quoted in the specification are ‘true values’. In the establishment of their limit values, the terms of EN ISO 4259-1:2017/A1:2021 ‘Petroleum and related products — Precision of measurement methods and results – Part 1: Determination of precision data in relation to methods of test’ have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account (R = reproducibility). The results of individual measurements shall be interpreted on the basis of the criteria described in EN ISO 4259-2:2017/A1:2019.’;
  - (c) the text of footnote 6 is replaced by the following:

‘(6) Other mono-alcohols and ethers with a final boiling point no higher than that stated in EN 228:2012 +A1:2017.’
- (2) Annex II is amended as follows:
  - (a) in the last line of the table, ‘FAME content – EN 14078, the entry in the last column ‘Limits’ ‘Maximum’, ‘7,0’ is replaced by ‘10.0’;
  - (b) the text of footnote 1 is replaced by the following:

‘(1) Test methods shall be those specified in EN 590:2013+A1:2017. Member States may adopt the analytical method specified in replacement EN 590:2013+A1:2017 standard if it can be shown to give at least the same accuracy and at least the same level of precision as the analytical method it replaces.’;
  - (c) the text of footnote 2 is replaced by the following:

‘(2) The values quoted in the specification are ‘true values’. In the establishment of their limit values, the terms of EN ISO 4259-1:2017/A1:2021 ‘Petroleum and related products — Precision or measurement methods and results – Part 1: Determination of precision data in relation to methods of test’ have been applied and in fixing a minimum value, a minimum difference of 2R above zero has been taken into account (R = reproducibility). The results of individual measurements shall be interpreted on the basis of the criteria described in EN ISO 4259-2:2017/A1:2019.’;
- (3) Annexes IV and V are deleted.