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ANNEX V

Rules for calculating the greenhouse gas impact of
biofuels, bioliquids and their fossil fuel comparators

D. Disaggregated default values for biofuels and bioliquids

Disaggregated default values for cultivation: 'e_{ec}' as defined in part C of this Annex

Biofuel and bioliquid production pathway	Typical greenhouse gas emissions(gCO_{2eq}/MJ)	Default greenhouse gas emissions(gCO_{2eq}/MJ)
sugar beet ethanol	12	12
wheat ethanol	23	23
corn (maize) ethanol, Community produced	20	20
sugar cane ethanol	14	14
the part from renewable sources of ETBE	Equal to that of the ethanol production pathway used	
the part from renewable sources of TAAE	Equal to that of the ethanol production pathway used	
rape seed biodiesel	29	29
sunflower biodiesel	18	18
soybean biodiesel	19	19
palm oil biodiesel	14	14
waste vegetable or animal ^a oil biodiesel	0	0
hydrotreated vegetable oil from rape seed	30	30
hydrotreated vegetable oil from sunflower	18	18
hydrotreated vegetable oil from palm oil	15	15
pure vegetable oil from rape seed	30	30
biogas from municipal organic waste as compressed natural gas	0	0
biogas from wet manure as compressed natural gas	0	0
biogas from dry manure as compressed natural gas	0	0

^a Not including animal oil produced from animal by-products classified as category 3 material in accordance with Regulation (EC) No 1774/2002.

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Disaggregated default values for processing (including excess electricity): 'e_p – e_{ee}' as defined in part C of this Annex

Biofuel and bioliquid production pathway	Typical greenhouse gas emissions(gCO_{2eq}/MJ)	Default greenhouse gas emissions(gCO_{2eq}/MJ)
sugar beet ethanol	19	26
wheat ethanol (process fuel not specified)	32	45
wheat ethanol (lignite as process fuel in CHP plant)	32	45
wheat ethanol (natural gas as process fuel in conventional boiler)	21	30
wheat ethanol (natural gas as process fuel in CHP plant)	14	19
wheat ethanol (straw as process fuel in CHP plant)	1	1
corn (maize) ethanol, Community produced (natural gas as process fuel in CHP plant)	15	21
sugar cane ethanol	1	1
the part from renewable sources of ETBE	Equal to that of the ethanol production pathway used	
the part from renewable sources of TAEE	Equal to that of the ethanol production pathway used	
rape seed biodiesel	16	22
sunflower biodiesel	16	22
soybean biodiesel	18	26
palm oil biodiesel (process not specified)	35	49
palm oil biodiesel (process with methane capture at oil mill)	13	18
waste vegetable or animal oil biodiesel	9	13
hydrotreated vegetable oil from rape seed	10	13
hydrotreated vegetable oil from sunflower	10	13

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hydrotreated vegetable oil from palm oil (process not specified)	30	42
hydrotreated vegetable oil from palm oil (process with methane capture at oil mill)	7	9
pure vegetable oil from rape seed	4	5
biogas from municipal organic waste as compressed natural gas	14	20
biogas from wet manure as compressed natural gas	8	11
biogas from dry manure as compressed natural gas	8	11

Disaggregated default values for transport and distribution: 'e_{td}' as defined in part C of this Annex

Biofuel and bioliquid production pathway	Typical greenhouse gas emissions(gCO_{2eq}/MJ)	Default greenhouse gas emissions(gCO_{2eq}/MJ)
sugar beet ethanol	2	2
wheat ethanol	2	2
corn (maize) ethanol, Community produced	2	2
sugar cane ethanol	9	9
the part from renewable sources of ETBE	Equal to that of the ethanol production pathway used	
the part from renewable sources of TAEE	Equal to that of the ethanol production pathway used	
rape seed biodiesel	1	1
sunflower biodiesel	1	1
soybean biodiesel	13	13
palm oil biodiesel	5	5
waste vegetable or animal oil biodiesel	1	1
hydrotreated vegetable oil from rape seed	1	1
hydrotreated vegetable oil from sunflower	1	1
hydrotreated vegetable oil from palm oil	5	5

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pure vegetable oil from rape seed	1	1
biogas from municipal organic waste as compressed natural gas	3	3
biogas from wet manure as compressed natural gas	5	5
biogas from dry manure as compressed natural gas	4	4

Total for cultivation, processing, transport and distribution

Biofuel and bioliquid production pathway	Typical greenhouse gas emissions(gCO_{2eq}/MJ)	Default greenhouse gas emissions(gCO_{2eq}/MJ)
sugar beet ethanol	33	40
wheat ethanol (process fuel not specified)	57	70
wheat ethanol (lignite as process fuel in CHP plant)	57	70
wheat ethanol (natural gas as process fuel in conventional boiler)	46	55
wheat ethanol (natural gas as process fuel in CHP plant)	39	44
wheat ethanol (straw as process fuel in CHP plant)	26	26
corn (maize) ethanol, Community produced (natural gas as process fuel in CHP plant)	37	43
sugar cane ethanol	24	24
the part from renewable sources of ETBE	Equal to that of the ethanol production pathway used	
the part from renewable sources of TAEE	Equal to that of the ethanol production pathway used	
rape seed biodiesel	46	52
sunflower biodiesel	35	41
soybean biodiesel	50	58
palm oil biodiesel (process not specified)	54	68

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palm oil biodiesel (process with methane capture at oil mill)	32	37
waste vegetable or animal oil biodiesel	10	14
hydrotreated vegetable oil from rape seed	41	44
hydrotreated vegetable oil from sunflower	29	32
hydrotreated vegetable oil from palm oil (process not specified)	50	62
hydrotreated vegetable oil from palm oil (process with methane capture at oil mill)	27	29
pure vegetable oil from rape seed	35	36
biogas from municipal organic waste as compressed natural gas	17	23
biogas from wet manure as compressed natural gas	13	16
biogas from dry manure as compressed natural gas	12	15