EUROPEAN COMMISSION

DIRECTORATE-GENERAL FOR MOBILITY AND TRANSPORT

Directorate C – Land

**C.1 – Road Transport**

# Directive 1999/62/EC on the charging of vehicles for the use of road infrastructures

## Thresholds of CO$_2$ emission classes

<u>Disclaimer</u>

This informative note is intended to assist the competent authorities, toll chargers, toll service providers, road transport undertakings and other relevant stakeholders in the application of Directive 1999/62/EC (in the document, "the Directive"). It has no legal effect and is intended for use as documentation only.
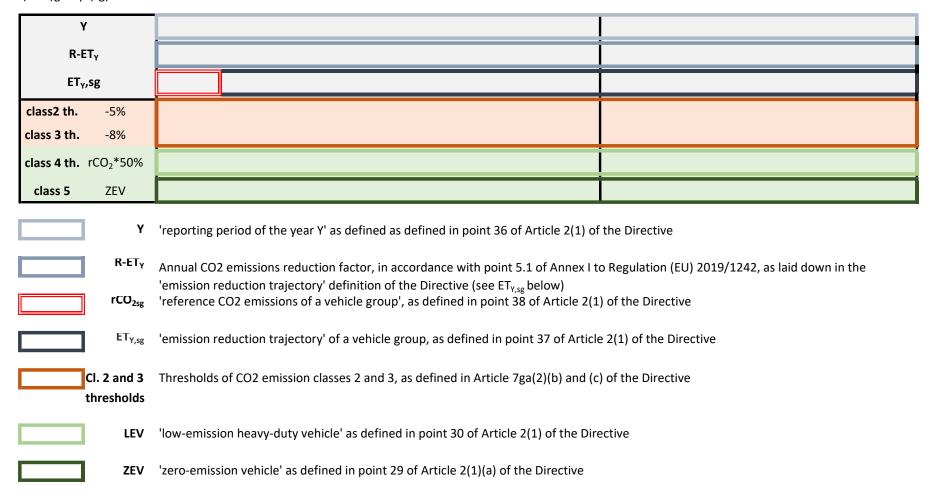
Version          1.1
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# Legend

The table below is designed to present the thresholds for CO2 emission classes per year (Y) in grams of $CO_2$ per tonne kilometre (g/tkm) for one (sub-)group (sg).

| | | | |
|---|---|---|---|
| **Y** | | | |
| **R-ET$_Y$** | | | |
| **ET$_Y$,sg** | | | |
| **class2 th.** | -5% | | |
| **class 3 th.** | -8% | | |
| **class 4 th.** | rCO$_2$*50% | | |
| **class 5** | ZEV | | |

**Y**    'reporting period of the year Y' as defined as defined in point 36 of Article 2(1) of the Directive

**R-ET$_Y$**    Annual CO2 emissions reduction factor, in accordance with point 5.1 of Annex I to Regulation (EU) 2019/1242, as laid down in the 'emission reduction trajectory' definition of the Directive (see ET$_{Y,sg}$ below)

**rCO$_{2sg}$**    'reference CO2 emissions of a vehicle group', as defined in point 38 of Article 2(1) of the Directive

**ET$_{Y,sg}$**    'emission reduction trajectory' of a vehicle group, as defined in point 37 of Article 2(1) of the Directive

**Cl. 2 and 3 thresholds**    Thresholds of CO2 emission classes 2 and 3, as defined in Article 7ga(2)(b) and (c) of the Directive

**LEV**    'low-emission heavy-duty vehicle' as defined in point 30 of Article 2(1) of the Directive

**ZEV**    'zero-emission vehicle' as defined in point 29 of Article 2(1)(a) of the Directive

Further explanatory notes to this legend are provided in the Annex I at the end of this document

# Sub-group 4-UD

| Y | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $R\text{-}ET_Y$ | 100.0% | 97.5% | 95.0% | 92.5% | 90.0% | 87.5% | 85.0% | 82.0% | 79.0% | 76.0% | 73.0% | 70.0% |
| $ET_Y,sg$ | 307.23 | 299.549 | 291.869 | 284.188 | 276.507 | 268.826 | 261.146 | 251.929 | 242.712 | 233.495 | 224.278 | 215.061 |
| class2 th.   -5% | 291.869 | 284.572 | 277.275 | 269.978 | 262.682 | 255.385 | 248.088 | 239.332 | 230.576 | 221.8201 | 213.064 | 204.308 |
| class 3 th.   -8% | 282.652 | 275.585 | 268.519 | 261.453 | 254.386 | 247.3202 | 240.254 | 231.774 | 223.295 | 214.815 | 206.336 | 197.856 |
| class 4 th.  $rCO_2*50\%$ | 153.615 | 153.615 | 153.615 | 153.615 | 153.615 | 153.615 | 153.615 | 153.615 | 153.615 | 153.615 | 153.615 | 153.615 |
| class 5   ZEV | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |

# Sub-group 4-RD

| Y | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $R\text{-}ET_Y$ | 100.0% | 97.5% | 95.0% | 92.5% | 90.0% | 87.5% | 85.0% | 82.0% | 79.0% | 76.0% | 73.0% | 70.0% |
| $ET_Y,sg$ | 197.16 | 192.231 | 187.302 | 182.373 | 177.444 | 172.515 | 167.586 | 161.671 | 155.756 | 149.842 | 143.927 | 138.012 |
| class2 th.  -5% | 187.302 | 182.619 | 177.937 | 173.254 | 168.572 | 163.889 | 159.207 | 153.588 | 147.969 | 142.3495 | 136.7305 | 131.111 |
| class 3 th.  -8% | 181.387 | 176.853 | 172.318 | 167.783 | 163.248 | 158.714 | 154.179 | 148.738 | 143.296 | 137.854 | 132.413 | 126.971 |
| class 4 th.  $rCO_2$*50% | 98.580 | 98.580 | 98.580 | 98.580 | 98.580 | 98.580 | 98.580 | 98.580 | 98.580 | 98.580 | 98.580 | 98.580 |
| class 5  ZEV | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |

# Sub-group 4-LH

| Y | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| R-ET$_Y$ | 100.0% | 97.5% | 95.0% | 92.5% | 90.0% | 87.5% | 85.0% | 82.0% | 79.0% | 76.0% | 73.0% | 70.0% |
| ET$_Y$,sg | 105.96 | 103.311 | 100.662 | 98.013 | 95.364 | 92.715 | 90.066 | 86.887 | 83.708 | 80.5296 | 77.351 | 74.172 |
| class2 th. −5% | 100.662 | 98.145 | 95.629 | 93.112 | 90.596 | 88.079 | 85.563 | 82.543 | 79.523 | 76.503 | 73.483 | 70.463 |
| class 3 th. −8% | 97.483 | 95.046 | 92.609 | 90.172 | 87.735 | 85.298 | 82.861 | 79.936 | 77.012 | 74.087 | 71.163 | 68.238 |
| class 4 th. rCO$_2$*50% | 52.980 | 52.980 | 52.980 | 52.980 | 52.980 | 52.980 | 52.980 | 52.980 | 52.980 | 52.980 | 52.980 | 52.980 |
| class 5 ZEV | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |

# Sub-group 5-RD

| Y | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $R\text{-}ET_Y$ | 100.0% | 97.5% | 95.0% | 92.5% | 90.0% | 87.5% | 85.0% | 82.0% | 79.0% | 76.0% | 73.0% | 70.0% |
| $ET_Y,sg$ | 84.00 | 81.900 | 79.800 | 77.700 | 75.600 | 73.500 | 71.400 | 68.880 | 66.360 | 63.840 | 61.320 | 58.800 |
| class2 th. -5% | 79.800 | 77.805 | 75.810 | 73.815 | 71.820 | 69.825 | 67.830 | 65.436 | 63.042 | 60.648 | 58.254 | 55.860 |
| class 3 th. -8% | 77.280 | 75.348 | 73.416 | 71.484 | 69.552 | 67.620 | 65.688 | 63.3696 | 61.051 | 58.733 | 56.414 | 54.096 |
| class 4 th. $rCO_2*50\%$ | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 | 42.000 |
| class 5 ZEV | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |

# Sub-group 5-LH

| Y | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $R\text{-}ET_Y$ | 100.0% | 97.5% | 95.0% | 92.5% | 90.0% | 87.5% | 85.0% | 82.0% | 79.0% | 76.0% | 73.0% | 70.0% |
| $ET_Y,sg$ | 56.60 | 55.185 | 53.770 | 52.355 | 50.940 | 49.525 | 48.110 | 46.412 | 44.714 | 43.016 | 41.318 | 39.620 |
| class2 th.   -5% | 53.770 | 52.426 | 51.082 | 49.737 | 48.393 | 47.049 | 45.705 | 44.091 | 42.478 | 40.865 | 39.252 | 37.639 |
| class 3 th.   -8% | 52.072 | 50.7702 | 49.468 | 48.167 | 46.865 | 45.563 | 44.261 | 42.699 | 41.137 | 39.575 | 38.013 | 36.4504 |
| class 4 th.  $rCO_2*50\%$ | 28.300 | 28.300 | 28.300 | 28.300 | 28.300 | 28.300 | 28.300 | 28.300 | 28.300 | 28.300 | 28.300 | 28.300 |
| class 5   ZEV | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |

# Sub-group 9-RD

| Y | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $R\text{-}ET_Y$ | 100.0% | 97.5% | 95.0% | 92.5% | 90.0% | 87.5% | 85.0% | 82.0% | 79.0% | 76.0% | 73.0% | 70.0% |
| $ET_Y,sg$ | 110.98 | 108.206 | 105.431 | 102.657 | 99.882 | 97.108 | 94.333 | 91.004 | 87.674 | 84.345 | 81.015 | 77.686 |
| class2 th.    -5% | 105.431 | 102.795 | 100.159 | 97.524 | 94.888 | 92.252 | 89.616 | 86.453 | 83.2905 | 80.128 | 76.965 | 73.802 |
| class 3 th.    -8% | 102.102 | 99.549 | 96.997 | 94.444 | 91.891 | 89.339 | 86.786 | 83.723 | 80.6603 | 77.597 | 74.534 | 71.471 |
| class 4 th.   $rCO_2*50\%$ | 55.490 | 55.490 | 55.490 | 55.490 | 55.490 | 55.490 | 55.490 | 55.490 | 55.490 | 55.490 | 55.490 | 55.490 |
| class 5    ZEV | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |

# Sub-group 9-LH

| Y | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $R\text{-}ET_Y$ | 100.0% | 97.5% | 95.0% | 92.5% | 90.0% | 87.5% | 85.0% | 82.0% | 79.0% | 76.0% | 73.0% | 70.0% |
| $ET_Y,sg$ | 65.16 | 63.531 | 61.902 | 60.273 | 58.644 | 57.015 | 55.386 | 53.431 | 51.476 | 49.522 | 47.567 | 45.612 |
| class2 th. $-5\%$ | 61.902 | 60.354 | 58.807 | 57.259 | 55.712 | 54.164 | 52.617 | 50.7596 | 48.903 | 47.046 | 45.188 | 43.331 |
| class 3 th. $-8\%$ | 59.947 | 58.449 | 56.9498 | 55.451 | 53.952 | 52.454 | 50.955 | 49.157 | 47.358 | 45.5599 | 43.761 | 41.963 |
| class 4 th. $rCO_2*50\%$ | 32.580 | 32.580 | 32.580 | 32.580 | 32.580 | 32.580 | 32.580 | 32.580 | 32.580 | 32.580 | 32.580 | 32.580 |
| class 5 ZEV | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |

# Sub-group 10-RD

| Y | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $R\text{-}ET_Y$ | 100.0% | 97.5% | 95.0% | 92.5% | 90.0% | 87.5% | 85.0% | 82.0% | 79.0% | 76.0% | 73.0% | 70.0% |
| $ET_Y,sg$ | 83.26 | 81.179 | 79.097 | 77.016 | 74.934 | 72.853 | 70.771 | 68.273 | 65.775 | 63.278 | 60.7798 | 58.282 |
| class2 th.  -5% | 79.097 | 77.1196 | 75.142 | 73.165 | 71.187 | 69.2099 | 67.232 | 64.8595 | 62.487 | 60.114 | 57.741 | 55.368 |
| class 3 th.  -8% | 76.599 | 74.684 | 72.769 | 70.854 | 68.939 | 67.024 | 65.109 | 62.811 | 60.513 | 58.215 | 55.917 | 53.619 |
| class 4 th.  $rCO_2*50\%$ | 41.630 | 41.630 | 41.630 | 41.630 | 41.630 | 41.630 | 41.630 | 41.630 | 41.630 | 41.630 | 41.630 | 41.630 |
| class 5  ZEV | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |

# Sub-group 10-LH

| Y | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $R\text{-}ET_Y$ | 100.0% | 97.5% | 95.0% | 92.5% | 90.0% | 87.5% | 85.0% | 82.0% | 79.0% | 76.0% | 73.0% | 70.0% |
| $ET_Y,sg$ | 58.26 | 56.804 | 55.347 | 53.891 | 52.434 | 50.978 | 49.521 | 47.773 | 46.025 | 44.278 | 42.5298 | 40.782 |
| class2 th. $\quad$ -5% | 55.347 | 53.963 | 52.5797 | 51.196 | 49.812 | 48.429 | 47.045 | 45.385 | 43.724 | 42.064 | 40.403 | 38.743 |
| class 3 th. $\quad$ -8% | 53.599 | 52.259 | 50.919 | 49.579 | 48.239 | 46.899 | 45.559 | 43.951 | 42.343 | 40.735 | 39.127 | 37.519 |
| class 4 th. $\;rCO_2*50\%$ | 29.130 | 29.130 | 29.130 | 29.130 | 29.130 | 29.130 | 29.130 | 29.130 | 29.130 | 29.130 | 29.130 | 29.130 |
| class 5 $\quad$ ZEV | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) | (0) |

# Annex I

**This annex provides additional explanation of the items listed in the legend at the beginnig of the document**

**Y**        'Reporting period of the year Y' means the period from 1 July of the year Y to 30 June of the year Y+1

**R-ET$_Y$**        for the reporting periods of the years Y from 2019 to 2025 is defined as:        $R\text{-}ET_Y = (1 - rf_{2025}) + rf_{2025} \times (2025 - Y) / 6$

for the reporting periods of the years Y from 2026 to 2030 is defined as:        $R\text{-}ET_Y = (1 - rf_{2030}) + (rf_{2030} - rf_{2025}) \times (20230 - Y) / 5$

for the reporting periods of the years Y > 2030  is defined as:        $R\text{-}ET_Y = 0{,}70$

$rf_{2025}$ and $rf_{2030}$ are the $CO_2$ emissions reduction targets (in %) applicable for the reporting periods of the years 2025 and 2030, respectively. Article 1 of Regulation (EU) 2019/1242 sets $rf_{2025}$ and $rf_{2030}$ at 15% and 30%, respectively.

**rCO$_{2sg}$**        The reference CO2 emissions ($rCO_{2sg}$) for vehicle groups 4, 5, 9, 10 are laid down in Annex II to Commission Implementing Decision (EU) 2021/781

| Sub-group (*sg*) | $rCO_{2sg}$ in g/tkm |
|---|---:|
| 4-UD | 307.23 |
| 4-RD | 197.16 |
| 4-LH | 105.96 |
| 5-RD | 84 |
| 5-LH | 56.6 |
| 9-RD | 110.98 |
| 9-LH | 65.16 |
| 10-RD | 83.26 |
| 10-LH | 58.26 |

**ET$_{Y,sg}$**        is defined in point 37 of Article 2(1) of the Directive as:        $ET_{Y,sg} = R\text{-}ET_Y \times rCO_{2sg}$

**Cl 2 and 3**  Thresholds of CO2 emission classes 2 and 3 are respectively 5% and 8% below $ET_{Y,sg}$ , as laid down in Article 7ga(2)(b) and (c) of the Directive
**thresholds**

**LEV**      'low-emission heavy-duty vehicle' is defined in point 30 of Article 2(1) of the Directive as: 'low-emission heavy-duty vehicle' means: (a) a low emission heavy-duty vehicle as defined in Article 3, point 12 of Regulation (EU) 2019/1242; or (b) a heavy-duty vehicle not covered by Article 2(1), points (a) to(d), of that Regulation, with CO2 emissions lower than 50 % of the reference CO2 emissions of its vehicle group, other than a zero-emission vehicle'. Article 3, point 12 of Regulation (EU) 2019/1242 defines 'low-emission heavy-duty vehicle' as: 'low-emission heavy-duty vehicle' means a heavy-duty vehicle, other than a zero-emission heavy-duty vehicle, with specific CO2 emissions of less than half of the reference CO2 emissions of all vehicles in the vehicle sub-group to which the heavy-duty vehicle belongs, as determined in accordance with point 2.3.3 of Annex I'

**ZEV**      'zero-emission vehicle' is defined in point 29 of Article 2(1)(a) of the Directive as: 'a zero-emission heavy-duty vehicle as defined in Article 3, point 11, of Regulation (EU) 2019/1242 of the European Parliament and of the Council'.
Article 3, point 11 of Regulation (EU) 2019/1242 defines 'zero-emission heavy-duty vehicle' as: 'zero-emission heavy-duty vehicle' means a heavy-duty vehicle without an internal combustion engine, or with an internal combustion engine that emits less than 1 g CO2/kWh as determined in accordance with Regulation (EC) No 595/2009 and its implementing measures, or which emits less than 1 g CO2/km as determined in accordance with Regulation (EC) No 715/2007 of the European Parliament and of the Council (16) and its implementing measures'

# Annex II

**This annex provides the version history of this document and a list of all changes**

| | | |
|---|---|---|
| Version 1.0 | 08/11/2022 | First publication of the document |
| Version 1.1 | 01/02/2023 | Changes to integrate comments from the German national authorities on:<br>- The definition of thresholds for classes 2 and 3;<br>- The rounding of decimal values.<br>(ref. move.ddg2.c.1(2023)1096555) |