**Annex V.11 Elements on verification activities under the Energy Sector**

**Comparison between Romanian and Bulgarian GHG inventory - Energy Sector IEFs data, in respect of 2022 year**

The following table presents a comparison between the implied CO2 emission factors resulting from the Romanian 2025 v1.8 submission and Bulgarian 2024 v0.1 inventory submission, on 2022 year for Energy Sector.

It could be observed that, generally, the related values of the implied emission factors are close values in some situations.

An explanation could be the fact that, the two countries are located in the same geographical area, and the influence of the climate conditions in the demand of the energy are almost the same. Using similar methodology, the countries specific emission factors are determined based on the operators reporting under the European Union Emissions trading Scheme (EU-ETS).

The differences are very small, are due to the quality, and supply sources of the fuels used in the combustion process, in different activity categories and, in the same measure due to the different technologies of the plants in the energy sector activities.

In transport sub-sector, mainly in road transport (due to the fact that the fleets structure is close of the two countries, and also due to the liquid fuels which are mixed, import with local supply), the IEFs values are close, too.

***Table 1 Comparison between Romanian and Bulgarian Energy Sector IEF data, in respect to 2022 year***

| **GREENHOUSE GAS SOURCE AND SINK CATEGORIES** | **CO2 IMPLIED EMISSION FACTORS (t/TJ)** | |
| --- | --- | --- |
| **BULGARIA**  **2024 v0.1 SUBMISSION** | **ROMANIA**  **2025 v1.8 SUBMISSION** |
| **1.A Fuel Combustion Activities** |  |  |
| Liquid Fuels | 72.84 | 72.84 |
| Solid Fuels | 101.09 | 80.31 |
| Gaseous Fuels | 55.77 | 55.67 |
| Other Fuels | 84.89 | 77.75 |
| Peat | NO | 106.00 |
| Biomass | 106.84 | 106.55 |
| **1.A.1 Energy Industries** |  |  |
| Liquid Fuels | 61.46 | 66.78 |
| Solid Fuels | 101.25 | 79.03 |
| Gaseous Fuels | 55.77 | 55.44 |
| Other Fuels | NO | IE,NO |
| Peat | NO | IE,NO |
| Biomass | 109.23 | 110.25 |
| ***a. Public Electricity and Heat Production*** |  |  |
| Liquid Fuels | 77.16 | 72.65 |
| Solid Fuels | 101.25 | 79.04 |
| Gaseous Fuels | 55.77 | 55.50 |
| Other Fuels | NO | IE,NO |
| Peat | NO | IE,NO |
| Biomass | 109.23 | 110.25 |
| ***b. Petroleum Refining*** |  |  |
| Liquid Fuels | 60.09 | 63.87 |
| Solid Fuels | NO | 60.83 |
| Gaseous Fuels | 55.77 | 52.85 |
| Other Fuels | NO | NO |
| Peat | NO | NO |
| Biomass | NO | 112.00 |
| ***c. Manufacture of Solid Fuels and Other Energy Industries*** |  |  |
| Liquid Fuels | 72.59 | 71.70 |
| Solid Fuels | 101.51 | IE,NO |
| Gaseous Fuels | 55.77 | 55.94 |
| Other Fuels | NO | IE,NO |
| Peat | NO | IE,NO |
| Biomass | NO | 112.00 |
| **1.A.2 Manufacturing Industries and Construction** |  |  |
| Liquid Fuels | 81.04 | 71.81 |
| Solid Fuels | 97.54 | 94.20 |
| Gaseous Fuels | 55.77 | 55.99 |
| Other Fuels | 86.08 | 77.58 |
| Peat | NO | IE,NO |
| Biomass | 109.87 | 107.95 |
| ***a. Iron and Steel*** |  |  |
| Liquid Fuels | 65.04 | 70.69 |
| Solid Fuels | 107.00 | 94.80 |
| Gaseous Fuels | 55.77 | 55.95 |
| Other Fuels | NO | 83.71 |
| Peat | NO | NO |
| Biomass | 112.00 | 112.00 |
| ***b. Non-Ferrous Metals*** |  |  |
| Liquid Fuels | 75.37 | 78.71 |
| Solid Fuels | 107.00 | IE |
| Gaseous Fuels | 55.77 | 56.12 |
| Other Fuels | NO | IE |
| Peat | NO | IE |
| Biomass | 112.00 | IE |
| ***c. Chemicals*** |  |  |
| Liquid Fuels | 85.50 | 59.34 |
| Solid Fuels | 93.66 | NO |
| Gaseous Fuels | 55.77 | 60.69 |
| Other Fuels | NO | 83.71 |
| Peat | NO | NO |
| Biomass | 112.00 | 109.87 |
| ***d. Pulp, Paper and Print*** |  |  |
| Liquid Fuels | 65.77 | 69.67 |
| Solid Fuels | 93.67 | 97.04 |
| Gaseous Fuels | 55.77 | 55.26 |
| Other Fuels | NO | 109.25 |
| Peat | NO | NO |
| Biomass | 112.00 | 112.00 |
| ***e. Food Processing, Beverages and Tobacco*** |  |  |
| Liquid Fuels | 70.18 | 71.88 |
| Solid Fuels | 98.02 | 96.32 |
| Gaseous Fuels | 55.77 | 55.55 |
| Other Fuels | NO | 87.14 |
| Peat | NO | NO |
| Biomass | 112.00 | 109.86 |
| ***f. Other - Other Industries*** |  |  |
| Liquid Fuels | 75.63 | 92.09 |
| Solid Fuels | 98.90 | 94.10 |
| Gaseous Fuels | 55.77 | 55.47 |
| Other Fuels | NO | 76.79 |
| Peat | NO | NO |
| Biomass | 112.00 | 97.85 |
| ***g. Other - Other Industries*** |  |  |
| Liquid Fuels | 75.59 | 71.20 |
| Solid Fuels | 93.71 | 97.04 |
| Gaseous Fuels | 55.77 | 55.39 |
| Other Fuels | 86.08 | 87.25 |
| Peat | NO | NO |
| Biomass | 105.18 | 111.99 |
| ***g.i Manufacturing of machinery*** |  |  |
| Liquid Fuels | 69.80 | 71.66 |
| Solid Fuels | 94.70 | NO |
| Gaseous Fuels | 55.77 | 55.41 |
| Other Fuels | NO | 91.70 |
| Peat | NO | NO |
| Biomass | 112.00 | 112.00 |
| ***g.ii Manufacturing of transport equipment*** |  |  |
| Liquid Fuels | 66.49 | 68.16 |
| Solid Fuels | 93.66 | NO |
| Gaseous Fuels | 55.77 | 55.41 |
| Other Fuels | NO | 87.14 |
| Peat | NO | NO |
| Biomass | 112.00 | NO |
| ***g.iii Mining (excluding fuels) and quarrying*** |  |  |
| Liquid Fuels | 74.15 | 73.46 |
| Solid Fuels | 93.66 | 97.04 |
| Gaseous Fuels | 55.77 | 55.41 |
| Other Fuels | NO | NO |
| Peat | NO | NO |
| Biomass | 112.00 | 112.00 |
| ***g.iv Wood and wood products*** |  |  |
| Liquid Fuels | 70.09 | 72.88 |
| Solid Fuels | 93.66 | NO |
| Gaseous Fuels | 55.77 | 55.41 |
| Other Fuels | NO | NO |
| Peat | NO | NO |
| Biomass | 112.00 | 112.00 |
| ***g.v Construction*** |  |  |
| Liquid Fuels | 71.57 | 72.11 |
| Solid Fuels | 98.40 | 97.04 |
| Gaseous Fuels | 55.77 | 55.41 |
| Other Fuels | NO | 86.42 |
| Peat | NO | NO |
| Biomass | 112.00 | 86.42 |
| ***g.vi Textile and leather*** |  |  |
| Liquid Fuels | 72.87 | 71.33 |
| Solid Fuels | 93.89 | NO |
| Gaseous Fuels | 55.77 | 55.41 |
| Other Fuels | NO | NO |
| Peat | NO | NO |
| Biomass | 112.00 | 112.00 |
| ***g.vii Off-road vehicles and other machinery*** |  |  |
| Liquid Fuels | 74.10 | NO |
| Solid Fuels | NO | NO |
| Gaseous Fuels | NO | NO |
| Other Fuels | NO | NO |
| Peat | NO | NO |
| Biomass | NO | NO |
| ***g.viii Other (please specify*** |  |  |
| Liquid Fuels | NO | 69.06 |
| Solid Fuels | NO | 97.04 |
| Gaseous Fuels | NO | 55.38 |
| Other Fuels | NO | NO |
| Peat | NO | NO |
| Biomass | NO | 112.00 |
| **1.A.3 Transport** |  |  |
| Liquid Fuels | 73.09 | 74.26 |
| Solid Fuels | NO | NO |
| Gaseous Fuels | 55.81 | 55.56 |
| Other Fuels | 74.65 | NO |
| Peat | NO | NO |
| Biomass | 74.19 | 74.10 |
| ***a. Civil Aviation*** |  |  |
| Aviation Gasoline | 69.30 | 70.00 |
| Jet Kerosene | 73.05 | 71.50 |
| ***b. Road Transportation*** |  |  |
| Gasoline | 71.84 | 75.06 |
| Diesel Oil | 74.93 | 74.33 |
| Liquefied Petroleum Gases (LPG) | 65.73 | 62.81 |
| Gaseous Fuels | 55.86 | 59.14 |
| Biomass | 74.19 | 74.10 |
| ***c. Railways*** |  |  |
| Liquid Fuels | 74.10 | 73.31 |
| Solid Fuels | NO | NO |
| Gaseous Fuels | NO | NO |
| Biomass | NO | 112.00 |
| ***d. Navigation*** |  |  |
| Residual Oil (Residual Fuel Oil) | NO | NO |
| Gas/Diesel Oil | 74.10 | 73.33 |
| Gasoline | NO | 71.62 |
| Gaseous Fuels | NO | NO |
| Biomass | NO | NO |
| ***e. Other Transportation*** |  |  |
| Liquid Fuels | NO | 71.62 |
| Solid Fuels | NO | NO |
| Gaseous Fuels | 55.77 | 55.54 |
| Other Fuels | NO | NO |
| Biomass | NO | NO |
| **1.A.4 Other Sectors** |  |  |
| Liquid Fuels | 72.26 | 70.00 |
| Solid Fuels | 94.44 | 86.20 |
| Gaseous Fuels | 55.77 | 55.54 |
| Other Fuels | NO | 91.70 |
| Peat | NO | 106.00 |
| Biomass | 111.29 | 111.97 |
| ***a. Commercial/Institutional*** |  |  |
| Liquid Fuels | 70.20 | 69.36 |
| Solid Fuels | 95.42 | 78.24 |
| Gaseous Fuels | 55.77 | 55.54 |
| Other Fuels | NO | 91.70 |
| Peat | NO | NO |
| Biomass | 110.75 | 110.88 |
| ***b. Residential*** |  |  |
| Liquid Fuels | 63.74 | 65.97 |
| Solid Fuels | 94.22 | 78.24 |
| Gaseous Fuels | 55.77 | 55.54 |
| Other Fuels | NO | IE,NO |
| Peat | NO | NO |
| Biomass | 112.00 | 112.00 |
| ***c. Agriculture/Forestry/Fisheries*** |  |  |
| Liquid Fuels | 73.95 | 73.12 |
| Solid Fuels | 95.13 | 105.97 |
| Gaseous Fuels | 55.77 | 55.54 |
| Other Fuels | NO | NO |
| Peat | NO | 106.00 |
| Biomass | 73.94 | 112.00 |
| **1.A.5 Other *(Not specified elsewhere)*** |  |  |
| ***a. Stationary (please specify)*** |  |  |
| Liquid Fuels | 71.50 | 73.33 |
| Solid Fuels | NO | NO |
| Gaseous Fuels | NO | NO |
| Other Fuels | NO | NO |
| Peat | NO | NO |
| Biomass | NO | NO |
| ***b. Mobile (please specify)*** |  |  |
| Liquid Fuels | NO | IE |
| Solid Fuels | NO | IE |
| Gaseous Fuels | NO | IE |
| Other Fuels | NO | IE |
| Biomass | NO | IE |