Appendix 8 Carbon Dioxide Emissions Factors

A8.1 Introduction

Table A.2 of Workbook 3.1 of the Australian National Greenhouse Gas Inventory (1996) specifies emission factors for carbon dioxide emissions in g/MJ. This appendix provides the emission factors for all the fuels used in this study.

Fuel	Carbon dioxide emission factor (g/MJ)	Notes
Low Sulfur Diesel	69.7	Workbook 3.1 – NGGIC (1996)
Ultra-low Sulfur Diesel	69.7	All diesel fuel taken to have the same emission factor
Fischer-Tropsch Diesel	69.7	All diesel fuel taken to have the same emission factor
Biodiesel	89	Beer et al. (2000) - Appendix 4
Canola	89	Assumed to be the same as biodiesel
Hydrated Ethanol	62.5	Stoichiometry (see note 1, 2)
Diesohol	69.7	Table 7.4 and Table 7.5 of Part 2 indicate that diesel and diesohol emissions of CO_2 do not differ.
CNG	54.4	Workbook 3.1 – NGGIC (1996) for natural gas
LNG	54.4	Workbook 3.1 – NGGIC (1996) for natural gas
LPG-HD5 (Propane)	59.8	Stoichiometry (see note 3)
Butane	61.3	Stoichiometry (see note 4)
LPG (Autogas)	59.4	Workbook 3.1 – NGGIC (1996) for liquefied petroleum gas
PULP	66	Workbook 3.1 – NGGIC (1996) for automotive gasoline
Anhydrous ethanol	62.5	Stoichiometry (see note 1, 2)
Petrohol	67.8	Based on reformulated gasoline results in MacLean (1998)
Hydrogen	0	No tailpipe emissions of CO_2

1. The calculations in the Workbook of the National Greenhouse Gas Inventory Committee (1996) are based on the gross calorific value (higher heating value). We have thus used the gross calorific value for the stoichiometric calculations. However, the note accompanying the table of fuel properties found on the alternative fuels data center web site (www.afdc.doe.gov) states: "since no vehicles in use, or currently being developed for future use, have powerplants capable of condensing the moisture of combustion, the lower heating value should be used for practical comparisons between fuels."
2. Based on the stoichiometry of ethyl alcohol with a gross calorific value of 30.6 MJ/kg.
3. Based on the stoichiometry of propane with a gross calorific value of 50.2 MJ/kg.
4. Based on the stoichiometry of butane with a gross calorific value of 49.5 MJ/kg.

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