API Compendium of Greenhouse Gas Emissions Methodologies for the Natural Gas and Oil Industry, dated November 2021

List of Technical Corrections

The following technical corrections have been noted for the 2021 version of the *API Compendium of Greenhouse Gas Emissions Methodologies for the Natural Gas and Oil Industry (Compendium).* A forthcoming update to the *Compendium* will address these and other issues and topics.

Equation 4-9 on page 4-12 (PDF 148): This equation describes how to calculate the carbon content of an individual hydrocarbon compound on a mass percent basis. The description variable, "X", for the stoichiometric coefficient for carbon contains an error in the example; "propane" should replace "pentane" in that description.

Section 5.1.1.3 on pages 5-4 through 5-6 (PDF 211-213): This section describes the difference between combustion efficiency and destruction efficiency for flares. Combustion efficiency is the "percentage of the carbon in the flare feed gas that is completely oxidized to CO_2" while destruction efficiency is the percentage of a specific compound in the flare feed gas, in particular methane, that is converted to a different compound although may not be fully oxidized to CO_2. Especially in older references, these terms were used interchangeably. In this discussion in the *Compendium*, "combustion efficiency" was erroneously used for "destruction efficiency" in a few instances. The term "destruction efficiency" should replace "combustion efficiency" associated with the following references:

- ICCT, 2014
- U.S. EPA, AP-42 Section 13.5.2, September 1991, Reformatted January 1995, Section Revised February 2018

Correspondingly, in Table 5-2, 98% should be listed under the Destruction Efficiency column instead of Combustion Efficiency for EPA, AP-42 Section 13.5.2, 2018.

Section 5.1.2 on pages 5-6 through 5-27 (PDF 213-231): This section describes how to estimate CO_2 and CH_4 emissions from flares. A default combustion efficiency of 96.5%

should be used to estimate CO_2; although for additional conservatism, 100% complete combustion can be assumed for CO_2 emissions. A default destruction efficiency of 99.5% for well-designed and operated refinery flares and 98% for production flares should be used to estimate CH_4 emissions. The default values for combustion efficiency and destruction efficiency in the equations should be updated to reflect the above stated default values. Revised calculation exhibits using the clarified default values will be provided in a forthcoming update to the document.

Equation 5-6 on page 5-6 (PDF 216): This equation describes how to estimate N_2O emissions from flares using default emissions factors. The default N_2O emission factor has incorrect default values for fuel gas and natural gas and should be corrected as follows.

Equation	Emission Factor	Gas Type	Corrected Default Value
5-6	EmF_{N2O}	fuel gas	6.0×10^{-4}
5-6	EmF_{N2O}	natural gas	1.0×10^{-4}

Section 6.3.8.4 on pages 6-52 and 6-54 (PDF 294 and 296): This section describes how to estimate CH_4 and CO_2 emissions from acid gas removal/sulfur recovery units. Two pages in this section have incorrect equation reference to the material balance approach. Equation 6-18 should replace Equation 6-17 in Figure 6-2 on page 6-52 and the last paragraph on page 6-54.

Equations 6-38 and 6-39 on pages 6-143 through 6-144 (PDF 385-386): These equations describe how to estimate CH_4 and N_2O emissions during the FCCU catalyst regeneration process using the default emission factors for petroleum coke. The default emission factors for petroleum coke have incorrect table references and should be corrected as tabulated below.

Equation	Default Emission Factor for Petroleum Coke	Corrected Table Reference
6-38	EF_{CO2}	4-5
6-38	EF_{CH4}	4-8
6-39	EF_{CO2}	4-5
6-39	EF_{N2O}	4-8

Equation 7-22 on page 7-188 (PDF 615): This equation describes how to estimate emissions from air conditioning equipment using a mass balance approach. The variables for quantity of refrigerant *i* in storage at the end of the year ($S_{E,i}$) and quantity of refrigerant *i* in storage at the beginning of the year ($S_{B,i}$) should be swapped so $S_{E,i}$ is subtracted from $S_{B,i}$ (i.e., a decrease in inventory during the reporting year represents emissions).