

**Handout 1.1.2**

**General Verifier Cap-and-Trade Regulation References**  
for California’s Mandatory GHG Reporting Program

**ARTICLE 5:**  
CALIFORNIA CAP ON GREENHOUSE GAS EMISSIONS AND  
MARKET-BASED COMPLIANCE MECHANISMS

<b>§ 95802. Definitions.....</b>	<b>2</b>
<b>§ 95840. Compliance Periods.....</b>	<b>2</b>
<b>§ 95852. Emission Categories Used to Calculate Compliance Obligations.....</b>	<b>3</b>
<b>§ 95852.1. Compliance Obligations for Biomass-Derived Fuels.....</b>	<b>3</b>
<b>§ 95852.1.1. Eligibility Requirements for Biomass-Derived Fuels.....</b>	<b>4</b>
<b>§ 95852.2. Emissions without a Compliance Obligation.....</b>	<b>6</b>

**§ 95802. Definitions.**

“Compliance Instrument” means an allowance or offset, issued by ARB or by an External Greenhouse Gas Emissions Trading System to which California has linked its Cap-and-Trade Program pursuant to subarticle 12, or sector-based offset credit. Each compliance instrument can be used to fulfill a compliance obligation equivalent to up to one metric ton of CO<sub>2e</sub>.

“Compliance Obligation” means the quantity of verified reported emissions or assigned emissions for which an entity must submit compliance instruments to ARB.

“Compliance Period” means the three-year period for which the compliance obligation is calculated for covered entities except for the first compliance period. The compliance obligation for the first compliance period only considers emissions from data years of 2013 and 2014.

“Covered Entity” means an entity within California that has one or more of the processes or operations and has a compliance obligation as specified in subarticle 7 of this regulation; and that has emitted, produced, imported, manufactured, or delivered in 2009 or any subsequent year more than the applicable threshold level specified in section 95812(a) of this rule.

“Linkage” means the approval of compliance instruments from an external greenhouse gas emission trading system (GHG ETS) to meet compliance obligations under this article, and the reciprocal approval of compliance instruments issued by California to meet compliance obligation in an external GHG ETS.

**§ 95840. Compliance Periods.**

Duration of Compliance Periods is as follows:

## General Verifier C&T References for MRR

- (a) The first compliance period starts on January 1, 2013, and ends on December 31, 2014.
- (b) The second compliance period starts on January 1, 2015, and ends on December 31, 2017.
- (c) The third compliance period starts on January 1, 2018, and ends on December 31, 2020.

### **§ 95852. Emission Categories Used to Calculate Compliance Obligations.**

- (a) Operators of Facilities.
  - (1) An operator of a facility covered under sections 95811(a) and 95812(c)(1) has a compliance obligation for every metric ton of CO<sub>2e</sub> for which a positive or qualified positive emissions data verification statement is issued per section 95131 of MRR, including process emissions, stationary combustion emissions and vented emissions. If ARB has assigned emissions for the sources subject to a compliance obligation pursuant to this section, the facility will have a compliance obligation equal to the value of every metric ton of CO<sub>2e</sub> assigned emissions. The entity's compliance obligation will be assessed at the facility level unless otherwise noted under section 95812(c).
  - (2) Beginning in 2015, combustion emissions resulting from burning RBOB, distillate fuel oils, or liquefied petroleum gas are not included when calculating an operator's compliance obligation.

#### **§ 95852.1. Compliance Obligations for Biomass-Derived Fuels.**

An entity that has emissions from combustion of biomass-derived fuels is required to report and verify its emissions pursuant to MRR and has a compliance obligation for every metric ton of CO<sub>2e</sub> emissions:

- (a) From combustion of fuel types that are not listed under section 95852.2; or

## General Verifier C&T References for MRR

- (b) From combustion of fuels sourced from outside California that do not meet the requirements of section 95852.1.1; or
- (c) That are reported as non-exempt biomass derived CO<sub>2</sub> under MRR.

### **§ 95852.1.1. Eligibility Requirements for Biomass-Derived Fuels.**

- (a) Biomass-derived fuel procured under contracts for biogas and biomethane must meet one of the following criteria. Only the portion of the fuel that meets one of these criteria will be considered a biomass-derived fuel. Emissions from combustion of this fuel will not be subject to a compliance obligation when reported as Biomass CO<sub>2</sub> in an emissions data report that has received a positive or qualified positive emissions data verification statement and determined as exempt pursuant to section 95852.2 and 95131(j) of MRR.
  - (1) The contract for purchasing any biomass-derived fuel must be executed prior to January 1, 2012 and remain in effect or have been renegotiated with the same California operator within one year of contract expiration. The delivery of the fuel under the contract must commence by one of the following dates to be eligible under this provision:
    - (A) 90 days after the execution date of the signed contract; or
    - (B) January 1, 2012; or
    - (C) 10 days after the date on which the CEC provides notice that the operator's electricity generating facility is certified as eligible for California's Renewables Portfolio Standard for the contracted biomass-derived fuel, or cannot be so certified, provided that the application for certification was submitted to the CEC before January 1, 2012.
  - (2) If the biomass-derived fuel does not meet the requirements of 95852.1.1(a)(1) then the biomass-derived fuel must meet one of the following requirements

## General Verifier C&T References for MRR

and the entity claiming the biomass-derived fuel must be the first entity to contract for the biomass-derived fuel:

- (A) An increase in the biomass derived fuel production capacity, at a particular site, where an increase is considered any amount over the average production at that site over the last three years; or
  - (B) Recovery of the fuel at a site where the fuel was previously being vented or destroyed for at least three years or since commencement of fuel recovery operations, whichever is shorter, without producing useful energy transfer.
- (3) If the biogas or biomethane is used at the site of production, and not transferred to another operator, thus not requiring a contract, the operator must demonstrate one of the following:
- (A) The fuel has been combusted in California prior to January 1, 2012; or
  - (B) The fuel was not previously used to produce useful energy transfer for at least three years or since commencement of fuel recovery operations, whichever is shorter.
- (4) The fuel being provided under a contract is for a fuel that was previously eligible under sections 95852.1.1(a)(1), (2) or (3), and the verifier is able to track the fuel to the previously eligible contract.
- (b) An entity may not sell, trade, give away, claim, or otherwise dispose of any of the carbon credits, carbon benefits, carbon emissions reductions, carbon offsets or allowances, howsoever entitled, attributed to the fuel production that would, when combined with the CO<sub>2</sub> emissions from complete combustion of the fuel, result in more CO<sub>2e</sub> emissions than would have occurred in the absence of the fuel production. In the case of biomethane or biogas produced from digesters or landfills, the resulting credit for avoided methane emissions may not exceed the global warming potential as listed in MRR for methane plus 2.75 in metric tons of

## General Verifier C&T References for MRR

CO<sub>2e</sub> per ton of captured methane. This includes any credit received by an entity in the Carbon Intensity calculation under the Low Carbon Fuel Standard Regulation (title 17, California Code of Regulations (CCR), sections 95480-95490) for methane capture. All calculations of CO<sub>2e</sub> emissions are based on the 100-year global warming potentials included in MRR. Generation of Renewable Energy Credits is excluded from this analysis and will not prevent a biomass-derived fuel that meets the requirements in this section from being exempt from a compliance obligation.

### **§ 95852.2. Emissions without a Compliance Obligation.**

Emissions from the following source categories and from the combustion of the following fuel types count toward applicable reporting thresholds, as applicable in MRR, but do not count toward a covered entity's compliance obligation set forth in this article unless those emissions are reported as non-exempt biomass-derived CO<sub>2</sub> under MRR. Emissions without a compliance obligation include:

- (a) CO<sub>2</sub> emissions from combustion of the following biomass-derived fuels:
  - (1) The biogenic fraction of solid waste materials as reported under MRR;
  - (2) Waste pallets, crates, dunnage, manufacturing and construction wood wastes, tree trimmings, mill residues, and range land maintenance residues;
  - (3) All agricultural crops or waste;
  - (4) Wood and wood wastes identified to follow all of the following practices:
    - (A) Harvested pursuant to an approved timber management plan prepared in accordance with the Z'berg-Nejedly Forest Practice Act of 1973 or other locally or nationally approved plan; and
    - (B) Harvested for the purpose of forest fire fuel reduction or forest stand improvement.

## General Verifier C&T References for MRR

- (5) Biodiesel:
  - (A) Agri-biodiesel derived solely from virgin oils, including esters derived from virgin vegetable oils from corn, soybeans, sunflower seeds, cottonseeds, canola, cramble, rapeseeds, safflowers, flaxseeds, rice bran, mustard seeds, and camelina, and from animal fats.
  - (B) Biodiesel is defined as monoalkyl esters of long chain fatty acids derived from the following plant or animal matter that meets the requirements of the American Society of Testing Materials (ASTM) D6751:
    - 1. Waste oils;
    - 2. Tallow; or
    - 3. Virgin oils.
- (6) Fuel ethanol (including denaturant):
  - (A) Cellulosic biofuel produced from lignocellulosic or hemicellulosic material that has a proof of at least 150 without regard to denaturants;
  - (B) Corn starch; or
  - (C) Sugar cane.
- (7) The biogenic fraction of municipal solid waste as reported under MRR, including MSW directly combusted or converted to a cleaner-burning fuel;
- (8) Biomethane and biogas from the following sources:
  - (A) All animal, plant and other organic waste; or
  - (B) Landfills and wastewater treatment plants;
- (9) Renewable diesel.

## General Verifier C&T References for MRR

- (b) The following additional process, vented, and fugitive emissions:
- (1) Emissions from geothermal generating units and geothermal facilities, including geothermal geyser steam or fluids;
  - (2) Vented and fugitive emissions from storage tanks used in petroleum and natural gas production and natural gas transmission;
  - (3) Vented and fugitive emissions reported under sections 95152(e) and (i) of MRR by local distribution companies that report under section 95122 of MRR;
  - (4) Vented and fugitive emissions from natural gas transmission storage tanks used in petroleum and natural gas production and natural gas transmission, and from produced water;
  - (5) Emissions reported by petroleum refineries from asphalt blowing operations, equipment leaks, storage tanks, and loading operations;
  - (6) Emissions from low-bleed pneumatic devices prior to January 1, 2019;
  - (7) Emissions from intermittent-bleed pneumatic devices beginning January 1, 2019;
  - (8) Vented emissions from well-site centrifugal and reciprocating compressors with a rated horsepower less than 250hp;
  - (9) Sources for which fugitive emissions are estimated using leak detection and leaker emission factors, as required by section 95153(o) of MRR, and sources for which vented and fugitive emissions are estimated using a population count and emissions factors, as required by section 95153(p) of MRR;
  - (10) Sources for which emissions originate from offshore petroleum and natural gas production facilities, as provided in section 95153(q) of MRR;



## General Verifier C&T References for MRR

- (11) Carbon dioxide that is exported for purposes other than geologic sequestration or enhanced oil recovery;
  - (12) Carbon dioxide used in the carbonation process during sugar production in facilities with NAICS code 311313;
  - (13) Carbon dioxide from fermentation that occurs during the production of food and beverages; and
  - (14) For fuel cells powered by biomass-derived fuels as defined in section 95852.1.1, process emissions from the oxidation of the biomass-derived fuel are exempt from a compliance obligation.
- (c) Other Exemptions. The operators of facilities with any of the following activities are exempt from compliance with this article:
- (1) NAICS Code 92811.

**Table 9-1: Product-Based Emissions Efficiency Benchmarks**

<b>NAICS Sector Definition</b>	<b>NAICS code</b>	<b>Activity (a)</b>	<b>Benchmark (Ba)</b>	<b>Benchmark Units</b>
Crude Petroleum and Natural Gas Extraction	211111	Thermal EOR Crude Oil Extraction	0.0811	Allowances / Barrel of Oil Eqv. Produced Using Thermal EOR
		Non Thermal Crude Oil Extraction	0.0076	Allowances / Barrel of Non Thermal Crude Oil Eqv.
		Natural Gas Processing $\geq 25$ MMscf/day	0.0220	Allowances / Barrel of Gas Processed Eqv.
Natural Gas Liquid Extraction	211112	Natural Gas Liquid Processing	0.0118	Allowances / Barrel of Natural Gas Liquids Produced
Potash, Soda, and Borate Mineral Mining	212391	Mining and Manufacturing of Soda Ash and Related Products (through vintage 2018 allocation)	0.948	Allowances / Short Ton of Soda Ash Equivalent (Soda Ash, Biocarb, Borax, V-Bor, DECA, PYROBOR, Boric Acid, and Sulfate)
		Mining and Manufacturing of Soda Ash and Related Products (vintage 2019 allocation and beyond)	1.13	Allowances / Short Ton of Soda Ash Equivalent
		Mining and Manufacturing of Borates (vintage 2019 allocation and beyond)	0.595	Allowances / Short Ton of Boric Oxide Equivalent
All Other Nonmetallic Mineral Mining	212399	Freshwater Diatomite Filter Aids Manufacturing	0.418	Allowances / Short Ton of Freshwater Diatomite Filter Aids

<b>NAICS Sector Definition</b>	<b>NAICS code</b>	<b>Activity (a)</b>	<b>Benchmark (Ba)</b>	<b>Benchmark Units</b>
Fruit and vegetable canning	311421	Aseptic Tomato Paste Processing	0.353	Allowances / Short Ton of 31% NTSS Aseptic Tomato Paste
		Aseptic Whole and Diced Tomato Processing	0.179	Allowances / Short Ton of Aseptic Whole and Diced Tomatoes
		Non-Aseptic Tomato Paste and Tomato Puree Processing	0.315	Allowances / Short Ton of 24% NTSS Non-Aseptic Tomato Paste and Tomato Puree
		Non-Aseptic Whole and Diced Tomato Processing	0.135	Allowances / Short Ton of Non-Aseptic Whole and Diced Tomatoes
		Non-Aseptic Tomato Juice Processing	0.163	Allowances / Short Ton of Non-Aseptic Tomato Juice
Poultry Processing	311615	Whole Chicken and Chicken Parts Processing	0.0330	Allowances / Short Ton of Whole Chicken and Chicken Parts
		Poultry Deli Product Processing	0.0353	Allowances / Short Ton of Poultry Deli Product
		Protein Meal and Fat Processing	0.396	Allowances / Short Ton of Protein Meal and Fat

<b>NAICS Sector Definition</b>	<b>NAICS code</b>	<b>Activity (a)</b>	<b>Benchmark (Ba)</b>	<b>Benchmark Units</b>
Dried and Dehydrated Food Manufacturing	311423	Dehydrated Garlic Processing	0.824	Allowances / Short Ton of Dehydrated Garlic
		Dehydrated Onion Processing	1.01	Allowances / Short Ton of Dehydrated Onion
		Dehydrated Chili Pepper Processing	1.29	Allowances / Short Ton of Dehydrated Chili Pepper
		Dehydrated Spinach Processing	5.56	Allowances / Short Ton of Dehydrated Spinach
		Dehydrated Parsley Processing	3.21	Allowances / Short Ton of Dehydrated Parsley
Dairy Product Manufacturing	31151	Milk, Buttermilk, Skim Milk, and Ultrafiltered Milk Processing (through vintage 2018 allocation)	0.0147	Allowances / Short Ton of Milk, Buttermilk, Skim Milk, and Ultrafiltered Milk
		Fluid Milk Product Processing (vintage 2019 allocation and beyond)	0.0149	Allowances / Short Ton of Fluid Milk Product
		Cream Processing (through vintage 2018 allocation)	0.0153	Allowances / Short Ton of Cream
		Butter Processing (through vintage 2018 allocation)	0.0391	Allowances / Short Ton of Butter

NAICS Sector Definition	NAICS code	Activity (a)	Benchmark (Ba)	Benchmark Units
Dairy Product Manufacturing	31151	Butter Processing (vintage 2019 allocation and beyond)	0.0415	Allowances / Short Ton of Butter
		Condensed Milk Processing (through vintage 2018 allocation)	0.0368	Allowances / Short Ton of Condensed Milk
		Condensed Milk Processing (vintage 2019 allocation and beyond)	0.0426	Allowances / Short Ton of Condensed Milk
		Nonfat Dry Milk and Skimmed Milk Powder (Low Heat) Processing (through vintage 2018 allocation)	0.380	Allowances / Short Ton of Nonfat Dry Milk and Skimmed Milk Powder (Low Heat)
		Milk Powder (Low Heat) Processing (vintage 2019 allocation and beyond)	0.376	Allowances / Short Ton of Milk Powder (Low Heat)
		Nonfat Dry Milk and Skimmed Milk Powder (Medium Heat and High Heat) Processing (through vintage 2018 allocation)	0.425	Allowances / Short Ton of Nonfat Dry Milk and Skimmed Milk Powder (Medium Heat and High Heat)
		Milk Powder (Medium Heat and High Heat) Processing (vintage 2019 allocation and beyond)	0.423	Allowances / Short Ton of Milk Powder (Medium Heat and High Heat)

NAICS Sector Definition	NAICS code	Activity (a)	Benchmark (Ba)	Benchmark Units
Dairy Product Manufacturing	31151	Buttermilk Powder Processing (through vintage 2018 allocation)	0.501	Allowances / Short Ton of Buttermilk Powder
		Buttermilk Powder Processing (vintage 2019 allocation and beyond)	0.469	Allowances / Short Ton of Buttermilk Powder
		Dairy Product Solids for Animal Feed Processing (through vintage 2018 allocation)	0.0241	Allowances / Short Ton of Dairy Product Solids for Animal Feed
		Intermediate Dairy Ingredients Processing (through vintage 2018 allocation)	0.0808	Allowances / Short Ton of Intermediate Dairy Ingredients
		Intermediate Dairy Ingredients Processing (vintage 2019 allocation and beyond)	0.076	Allowances / Short Ton of Intermediate Dairy Ingredients
		Cheese Processing	0.114	Allowances / Short Ton of Cheese
		Lactose Processing	0.272	Allowances / Short Ton of Lactose
		Whey Protein Concentrate Processing	1.28	Allowances / Short Ton of Whey Protein Concentrate
		Deproteinized Whey Processing	0.764	Allowances / Short Ton of Deproteinized Whey

<b>NAICS Sector Definition</b>	<b>NAICS code</b>	<b>Activity (a)</b>	<b>Benchmark (Ba)</b>	<b>Benchmark Units</b>
Roasted Nuts and Peanut Butter Manufacturing	311911	Pistachio Processing (through vintage 2018 allocation)	0.221	Allowances / Short Ton of Pistachios
		Almond Processing (through vintage 2018 allocation)	0.0714	Allowances / Short Ton of Almonds
		Almond Blanching (vintage 2019 allocation and beyond)	0.0704	Allowances / Short Ton of Blanched Almonds
		Almond Flavoring (vintage 2019 allocation and beyond)	0.127	Allowances / Short Ton of Flavored Almonds
		Almond Pasteurization (vintage 2019 allocation and beyond)	0.0420	Allowances / Short Ton of Pasteurized Almonds
		Pistachio Flavoring (vintage 2019 allocation and beyond)	0.0710	Allowances / Short Ton of Flavored Pistachios
		Pistachio Hulling and Drying (vintage 2019 allocation and beyond)	0.187	Allowances / Short Ton of Adjusted Hulled and Dried Pistachios
Snack Food Manufacturing	31191	Fried Potato Chips Processing	0.834	Allowances / Short Ton of Fried Potato Chips
		Baked Potato Chips Processing	0.517	Allowances / Short Ton of Baked Potato Chips
		Corn Chips Processing	0.580	Allowances / Short Ton of Corn Chips
		Corn Curls Processing	0.446	Allowances / Short Ton of Corn Curls
		Pretzel Processing	0.633	Allowances / Short Ton of Pretzels

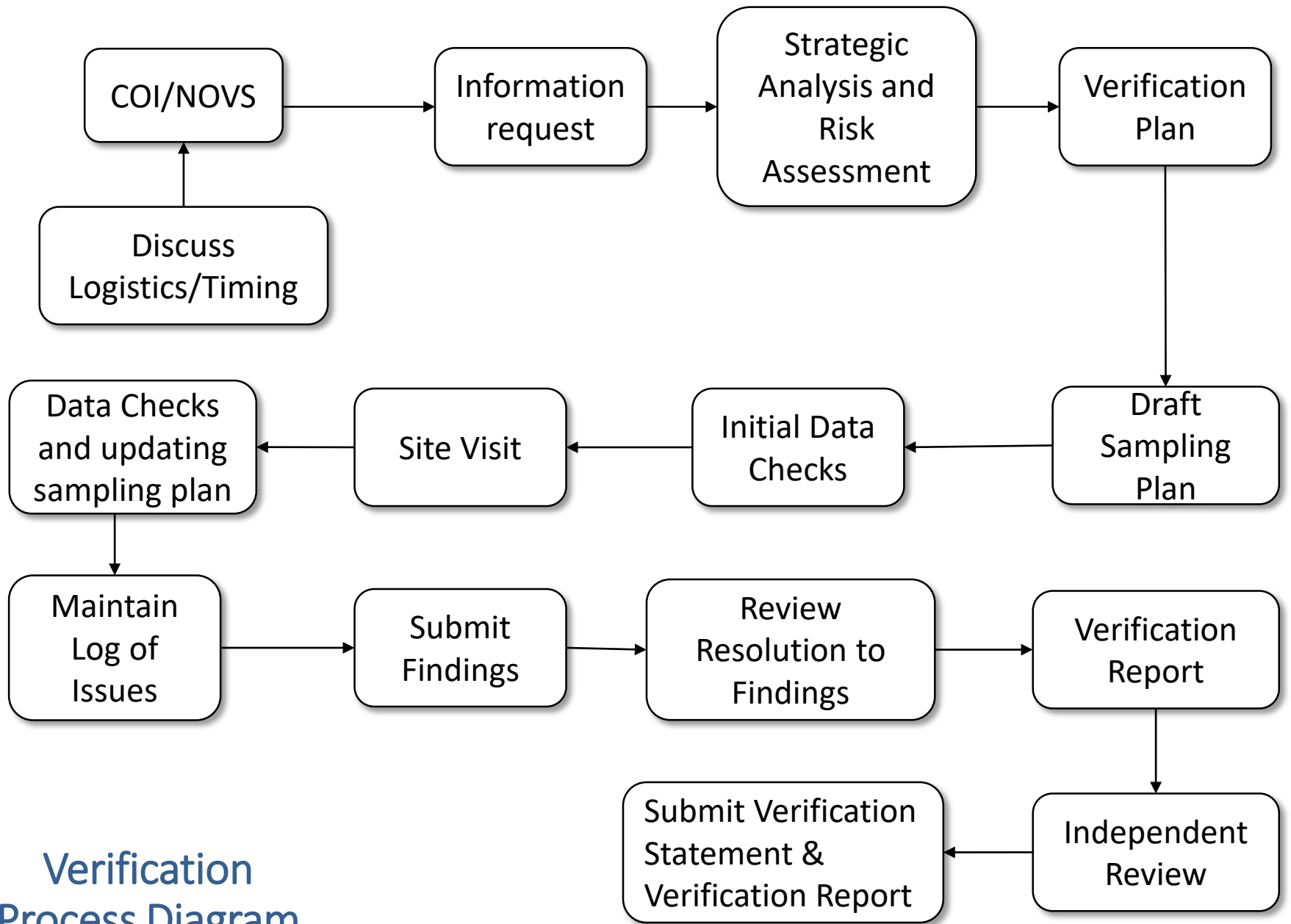
<b>NAICS Sector Definition</b>	<b>NAICS code</b>	<b>Activity (a)</b>	<b>Benchmark (Ba)</b>	<b>Benchmark Units</b>
Beet sugar manufacturing	311313	Beet sugar manufacturing	0.611	Allowances / short ton Granulated-Refined Sugar
Breweries	312120	Lager Beer Manufacturing	0.178	Allowances / Thousand Gallons of Lager Beer
Wineries	312130	Distilled Spirits Production	$1.13 \times 10^{-3}$	Allowances / Proof Gallons of Distilled Spirits
		Dry Color Concentrate Production	12.0	Allowances / Short ton of Dry Color Concentrate
		Grape Juice Concentrate Production	$1.59 \times 10^{-3}$	Allowances / Gallons of Grape Juice Concentrate
		Grape Seed Extract Production	9.48	Allowances / Short ton of Grape Seed Extract
		Liquid Color Concentrate Production	$6.95 \times 10^{-3}$	Allowances / Gallons of Liquid Color Concentrate
Paperboard Mills	322130	Recycled Boxboard Manufacturing	0.516	Allowances / Air Dried Short Ton of Recycled Boxboard
		Recycled Linerboard (Testliner) Manufacturing	0.562	Allowances / Air Dried Short Ton of Recycled Linerboard
		Recycled Medium (Fluting) Manufacturing	0.392	Allowances / Air Dried Short Ton of Recycled Medium
Petroleum Refineries	324110	Petroleum Refining	3.89	Allowances / Complexity Weighted Barrel



<b>NAICS Sector Definition</b>	<b>NAICS code</b>	<b>Activity (a)</b>	<b>Benchmark (Ba)</b>	<b>Benchmark Units</b>
All Other Petroleum and Coal Products Manufacturing	324199	Coke Calcining	0.632	Allowances/ Metric Ton Calcined Coke
Industrial Gas Manufacturing	325120	On-Purpose Hydrogen Gas Production	8.94	Allowances / Metric Ton of On-Purpose Hydrogen Gas
		Liquid Hydrogen Production	11.9	Allowances / Metric Ton of Liquid Hydrogen Sold
All Other Basic Inorganic Chemical Manufacturing	325188	Sulfuric Acid Regeneration (vintage 2019 allocation and beyond)	0.147	Allowances / Short Ton of Sulfuric Acid Produced
Nitrogenous Fertilizer Manufacturing	325311	Nitric Acid Production	0.0957	Allowances / Short ton of nitric acid (HNO <sub>3</sub> 100%)
		Calcium Ammonium Nitrate Solution Production	0.00	Allowances / Short ton of Calcium Ammonium Nitrate Solution
Flat Glass Manufacturing	327211	Flat glass Manufacturing	0.495	Allowances / Short Ton of Flat Glass Pulled
Glass Container Manufacturing	327213	Container Glass Manufacturing	0.270	Allowances / Short Ton of Container Glass Pulled
Mineral Wool Manufacturing	327993	Fiber Glass Manufacturing	0.394	Allowances / Short Ton of Fiberglass Pulled
Cement Manufacturing	327310	Cement Manufacturing	0.742	Allowances / Short ton of adjusted clinker and mineral additives produced

<b>NAICS Sector Definition</b>	<b>NAICS code</b>	<b>Activity (a)</b>	<b>Benchmark (Ba)</b>	<b>Benchmark Units</b>
Lime Manufacturing	327410	Dolime Manufacturing	1.40	Allowances / Short Ton of Dolime Produced
Gypsum Product Manufacturing	327420	Plaster Manufacturing	0.0454	Allowances / Short Ton of Plaster Sold as a Separate Finished Product
		Stucco Manufacturing	0.134	Allowances / Short Ton of Stucco used to produce saleable plasterboard
Iron and Steel Mills	331111	Steel Production Using an Electric Arc Furnace	0.170	Allowances / Short ton of Steel produced using EAF
Secondary smelting and alloying of aluminum	331314	Aluminum and Aluminum Alloy Billet Manufacturing	0.371	Allowances / Short ton of Aluminum and Aluminum alloy Billet
Secondary smelting, refining, and alloying of nonferrous metal (except copper and aluminum)	331492	Lead Acid Battery Recycling	0.511	Allowances / Short Ton of Lead and Lead Alloys
Iron Foundries	331511	Ductile Iron Pipe Manufacturing	0.561	Allowances / Short ton of Ductile Iron Pipes
Nonferrous Forging	332112	Seamless Rolled Ring	3.14	Allowances / Short ton of Seamless Rolled Ring

<b>NAICS Sector Definition</b>	<b>NAICS code</b>	<b>Activity (a)</b>	<b>Benchmark (Ba)</b>	<b>Benchmark Units</b>
Rolled Steel Shape Manufacturing	331221	Hot Rolled Steel Sheet Production	0.0843	Allowances / Short ton of hot rolled steel sheet
		Pickled Steel Sheet Production	0.0123	Allowances / Short ton of pickled steel sheet
		Cold Rolled and Annealed Steel Sheet Production	0.0520	Allowances / Short ton of cold rolled and annealed steel sheet
		Galvanized Steel Sheet Production	0.0504	Allowances / Short ton of galvanized steel sheet
		Tin Steel Plate Production	0.111	Allowances / Short ton of tin plate
Turbine and Turbine Generator Set Units Manufacturing	333611	Testing of Turbines and Turbine Generator Sets	0.00782	Allowances / Horsepower tested



Verification  
Process Diagram  
Handout 1.1.3

Course 1-1: Handout 1.1.4 Issues Log Examples

Issues Log (BAD version)						
Reporting Entity: ACME Combustion (ARB ID# 100999)						
Subparts Reported: C						
Year of Emissions Data: 2019						
Lead Verifier: Mary Smith						
#	Date	Description of Issue/Source	Regulation Citation	Potential Impact upon GHG Data	Action Required by Reporting Entity	Resolution
1	4/23	GHG Monitoring Plan (1)	MRR §95105 (2)	Meter and calibration issues may affect report. (3)	Correct error. (4)	Resolved. (5)
2	5/15	Propane heaters (6)	MRR §95115 (7)	Non-conformance (8)	Report emissions from propane as De Minimis.(9)	Reporter used verifier calculations (10)
3	5/15	The reporting entity calculated emissions from RUZ10 boiler burning non-pipeline quality natural gas using the default high heating value of 1,028 Btu/scf for pipeline quality natural gas.	MRR §95115(c) and 40 CFR §98.33(b)	Non-conformance; correctable error.	Provide the regulation citation that allows for the use of a Tier 1 calculation for non-pipeline quality natural gas. Please determine if §95115(c)(4) applies to your facility and revise your emissions data report by 5/30. Please contact ARB staff if you have questions about which Tier to use to report your emissions data.	<b>Resolved on 5/25 via email.</b> Reporting entity revised their emissions calculation to use Tier 3. Calibrations, MW calcs, flow measurements and corrections are all provided in GT40-GHGdata.xlsx spreadsheet. Calculation is in conformance (EDR certified in Cal e-GGRT 5/24).

Course 1-1: Handout 1.1.4 Issues Log Examples

Issues Log <b>GOOD</b> version)						
Reporting Entity: ACME Combustion (ARB ID# 100999)						
Subparts Reported: C						
Year of Emissions Data: 2019						
Lead Verifier: Mary Smith						
#	Date	Description of Issue/Source	Regulation Citation	Potential Impact upon GHG Data	Action Required by Reporting Entity	Resolution
1	4/23/20	GHG Monitoring Plan incomplete.	MRR §95105(c)	Meter location, description, and calibration records not made available. Non-conformance if not provided.	Please email these documents to me before the site visit on May 15. Failure to demonstrate accuracy may result in possible material misstatement and an adverse verification statement.	<b><u>Resolved on 5/10 via email. Revised Plan emailed on 5/10 and was found to be complete.</u></b>
2	5/15/20	Emissions from propane heaters in Bldg. 54-A not reported.	40 CFR §98.32, and MRR §95115	Non-conformance; correctable error.	Provide invoices from 2018, 2019, and 2020, to include the delivery date and amount of fuel delivered. Report propane emissions in Cal e-GGRT. This error must be fixed, or an adverse emissions data verification statement would be triggered.	Resolved on 5/20 via email. Invoices clearly showed fuel purchases (~usage) for 2019, and were clearly billed starting on the first day of each month. Propane emissions reported as de minimis. Calculation method is reasonable (Tier 1); emissions confirmed to be <3% of total and <20,000 MT CO <sub>2</sub> e.
3	5/15/20	The reporting entity calculated emissions from RUZ10 boiler burning non-pipeline quality natural gas using the default high heating value of 1,028 Btu/scf for pipeline quality natural gas.	MRR §95115(c) and 40 CFR §98.33(b)	Non-conformance; correctable error.	Provide the regulation citation that allows for the use of a Tier 1 calculation for non-pipeline quality natural gas. Please determine if §95115(c)(4) applies to your facility and revise your emissions data report by 5/30/2017. Please contact ARB staff if you have questions about which Tier to use to report your emissions data.	<b><u>Resolved on 5/25 via email. Reporting entity revised their emissions calculation to use Tier 3. Calibrations, MW calcs, flow measurements and corrections are all provided in GT40-GHGdata.xlsx spreadsheet. Calculation is in conformance (EDR certified in Cal e-GGRT 5/24).</u></b>

[Note: For the "Resolution" column, some verifiers ask the client to provide an explanation of what data was revised directly in the issues log, while other verifiers prefer to control their own document and request responses in a separate document.

Text of email that includes the draft issues log as an attachment:  
 To avoid an adverse emissions data verification statement for not fixing a correctable error, please report those emissions and re-certify your emissions data report by August 1.

**Course 1.2, Handout # 1.2.1 Minimal Allowable Methods (Tiers) under §95115**

For facilities that qualify for abbreviated reporting under section 95103(a), they may use any method in 40 CFR 98.33(a) to calculate GHG emissions.

Combustion Unit Size	Additional Requirement(s)	Minimum Allowable Tier [Reference]
<b>MSW</b>		
> 600 tons MSW/day	<ul style="list-style-type: none"> <li>• Unit has operated more than 1,000 hours in any calendar year since 2005; and</li> <li>• Unit has existing CEMS, including gas monitors or stack gas volumetric flow rate monitor (or both) required by Federal or State regulation or the unit's operating permit; and</li> <li>• The CEMS has been certified according to Part 75, part 60, or an applicable state monitoring program; and</li> <li>• Facility has established monitoring infrastructure and meets specific QA/QC requirements according to Part 75, part 60, or an applicable state monitoring program</li> </ul>	4 [§95115(a)]
	Unit does not meet conditions above for Tier 4, and produces steam	2 [§95115(a)]
	Unit does not meet conditions above for Tier 4, and does not produce steam (It is unlikely that MSW units this size do not produce steam, so it is unlikely that this situation will be found)	1
≤ 600 tons MSW/day	<ul style="list-style-type: none"> <li>• Unit has operated more than 1,000 hours in any calendar year since 2005; and</li> <li>• Unit has existing, certified CO<sub>2</sub> concentration monitor and stack gas volumetric flow rate monitor required by Federal or State regulation or the unit's operating permit; and</li> <li>• The CEMS has been certified according to Part 75, part 60, or an applicable state monitoring program; and</li> <li>• Facility has established monitoring infrastructure and meets specific QA/QC requirements according to part 75, part 60, or an applicable state monitoring program</li> </ul>	4
	Unit does not meet conditions above for Tier 4, and produces steam	2 [§95115(a)]
	Unit does not meet conditions above for Tier 4 and does not produce steam. (This situation corresponds to a small batch-fed MSW incinerator; these are not likely to be found in a situation requiring verification, and Tier 1 can only be used if the fuel meet the de minimis provisions §95103(i))	1
<b>Solid Biomass Fuels</b>		
Any size	Unit that produces steam, and is not required to use tier 4	2 [§95115(a)]

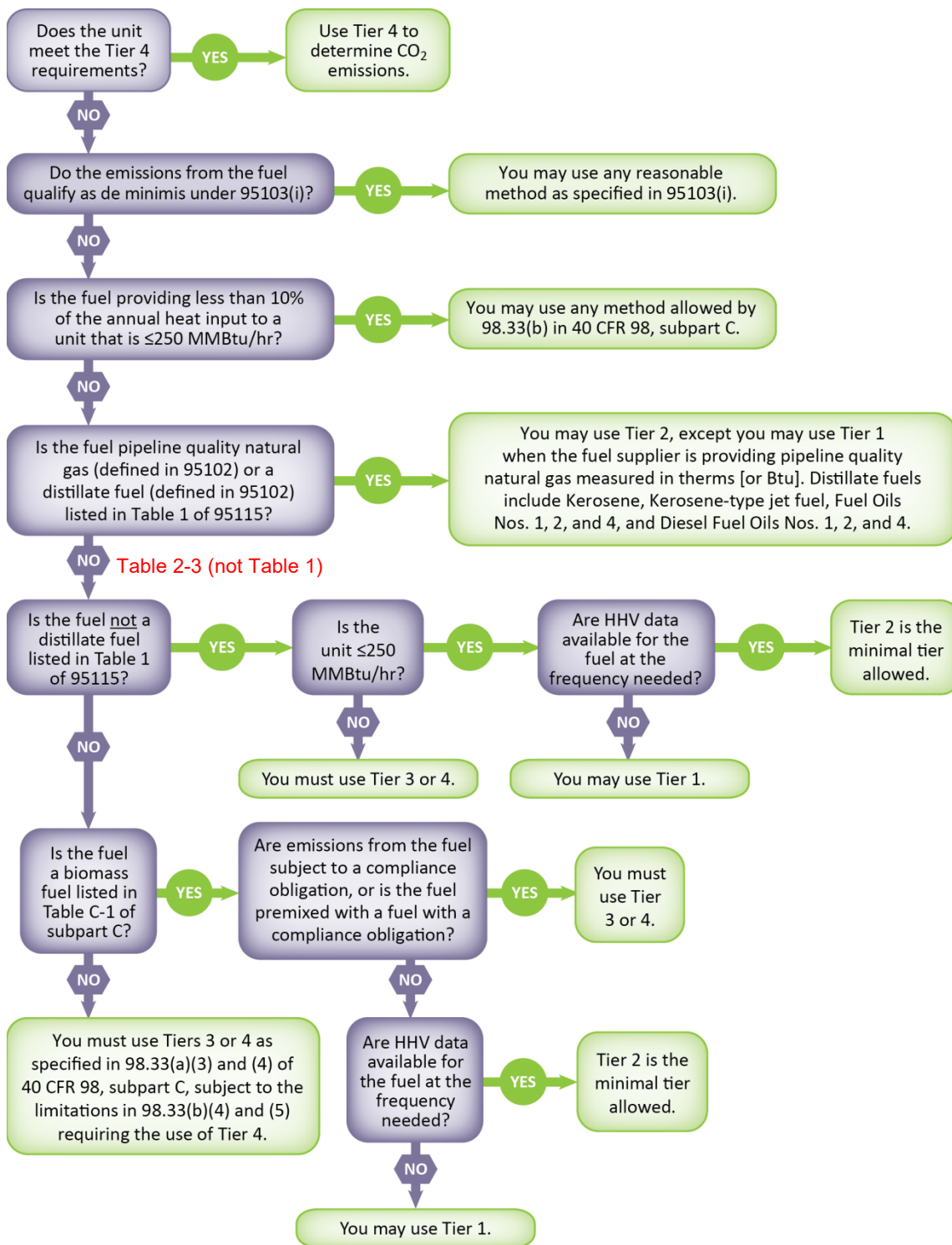
Combustion Unit Size	Additional Requirement(s)	Minimum Allowable Tier [Reference]
	<ul style="list-style-type: none"> <li>Unit that does not produce steam; and</li> <li>Is not required to use tier 4; and</li> <li>Fuel is not subject to a compliance obligation, and is not mixed prior to combustion with a fuel subject to a compliance obligation</li> </ul>	1
<b>Fossil-based Solid Fuels (e.g., Coal)</b>		
> 250 MMBtu.hr	<ul style="list-style-type: none"> <li>Unit has operated more than 1,000 hours in any calendar year since 2005; and</li> <li>Unit has existing CEMS, including gas monitors or stack gas volumetric flow rate monitor (or both) required by Federal or State regulation or the unit's operating permit; and</li> <li>The CEMS has been certified according to Part 75, part 60, or an applicable state monitoring program; and</li> <li>Facility has established monitoring infrastructure and meets specific QA/QC requirements according to Part 75, part 60, or an applicable state monitoring program.</li> </ul>	4 [\$95115(a)]
	<ul style="list-style-type: none"> <li>The unit does not meet conditions above to use Tier 4; and</li> <li>The unit produces steam</li> </ul>	3 [\$95115(a)]
≤ 250 MMBtu/hr	<ul style="list-style-type: none"> <li>Unit has operated more than 1,000 hours in any calendar year since 2005; and</li> <li>Unit has existing, certified CO<sub>2</sub> concentration monitor and stack gas volumetric flow rate monitor required by Federal or State regulation or the unit's operating permit; and</li> <li>The CEMS has been certified according to Part 75, part 60, or an applicable state monitoring program; and</li> <li>Facility has established monitoring infrastructure and meets specific QA/QC requirements according to Part 75, part 60, or an applicable state monitoring program.</li> </ul>	4 [\$95115(a)]
	<ul style="list-style-type: none"> <li>The unit does not meet conditions above for Tier 4;</li> <li>The unit produces steam.</li> </ul>	3 [\$95115(a)]
<b>Non-distillate Fuels listed in Table 2-3 of §95115</b>		
> 250 MMBtu/hr	<i>See the rows for "All other fuels" at the end of this table.</i>	
≤250 MMBtu/hr	<ul style="list-style-type: none"> <li>Routine fuel sampling and analysis for the fuel high heat value (HHV) by reporter or fuel supplier at the minimum or greater frequency specified in 40 CFR 98.34(a)</li> </ul>	2 [\$95115(c)(1)]
	<ul style="list-style-type: none"> <li>You do not meet the conditions above for obtaining HHV data.</li> </ul>	1 [\$95115(c)(1)]
<b>Biomass-derived fuels listed in Table C-1 of 40 CFR part 98 subpart C</b>		
Any size	<ul style="list-style-type: none"> <li>Emissions are not subject to a compliance obligation under the cap and trade regulation; and</li> <li>Not mixed prior to combustion with a fuel that has emissions subject to a compliance obligation under the cap and trade regulation.</li> </ul>	1 or 2 [\$95115(c)(1)]



Combustion Unit Size	Additional Requirement(s)	Minimum Allowable Tier [Reference]
<b>Pipeline Quality Natural Gas</b>		
Any size	The annual consumption is <u>not</u> obtained from billing records in units of therms or MMBtus.	2 [\$95115(c)(2)]
	The annual consumption is obtained from billing records in units of therms or MMBtus.	1 [\$95115(c)(2)]
<b>Distillate Fuels Listed in Table 2-3 (Kerosene, Kerosene-type jet fuel, Diesel Fuels Nos. 1, 2, and 4, and Fuel Oils Nos. 1, 2, and 4.)</b>		
Any size	The unit does not meet the requirements to use Tier 4	2 [\$95115(c)(2)]
<b>Emissions are de minimis under §95103(i)</b> [A portion of GHG emissions representing no more than 3 percent of a facility's total CO <sub>2</sub> equivalent emissions (including emissions from biomass-derived fuels and feedstocks), not to exceed 20,000 metric tons of CO <sub>2</sub> e.]		
Any size	The unit does not meet the requirements to use Tier 4	Any method in 40 CFR 98.33(a) permitted by 98.33(b) [\$95115(c)(3)]
A fuel providing less than 10 percent of the annual heat input to a unit <250 MMBtu/hr		
<250 MMBtu/hr	The unit does not meet the requirements to use Tier 4	Any method in 40 CFR 98.33(a) permitted by 40 CFR 98.33(b) [\$95115(c)(3)]
All other fuels		
Any size	The unit meets the requirements to use Tier 4 in 40 CFR 98.33(b)(4) and (b)(5).	4 [\$95115(c)(4)]
	The unit does not meet the requirements to use Tier 4 in 40 CFR 98.33(b).	3 [\$95115(c)(4)]

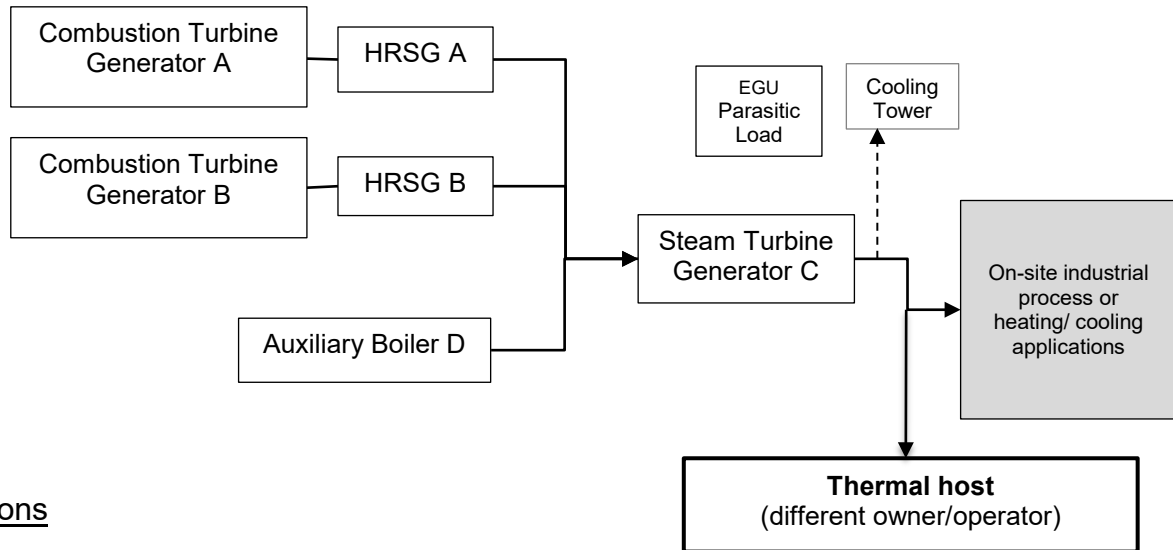
## Selection of Allowable Methods (Tiers) under §95115

Reporting Entities must follow the tier selection shown here. Facilities that qualify for abbreviated reporting under §95103(a) may use any method in 40 CFR 98.33(a) to calculate GHG emissions.



## Course 1.4: Handout 1.4.1 Energy Disposition

This example shows a cogeneration facility that includes two combustion turbine generators with HRSGs and a boiler that produces steam to power a steam turbine generator. Steam is used on-site and sold to a thermal host.



### Questions

1. (a) Draw the energy (fuel, electricity, and steam) flows and the system boundary such that all integrated units associated with energy production are included in the same box. (b) What type of electricity generating facility is this (section 95112(c))?

*Answer: (a) See diagram on next page. (b) This example is an industrial/institutional/commercial facility with electricity generation capacity. It is not 95112(c), it is under 95112(a)(3).*

2. Which electricity pathways represent gross generation?

*Answer: All electricity from the cogeneration system including EGU parasitic load.  $E_A + E_B + E_C$*

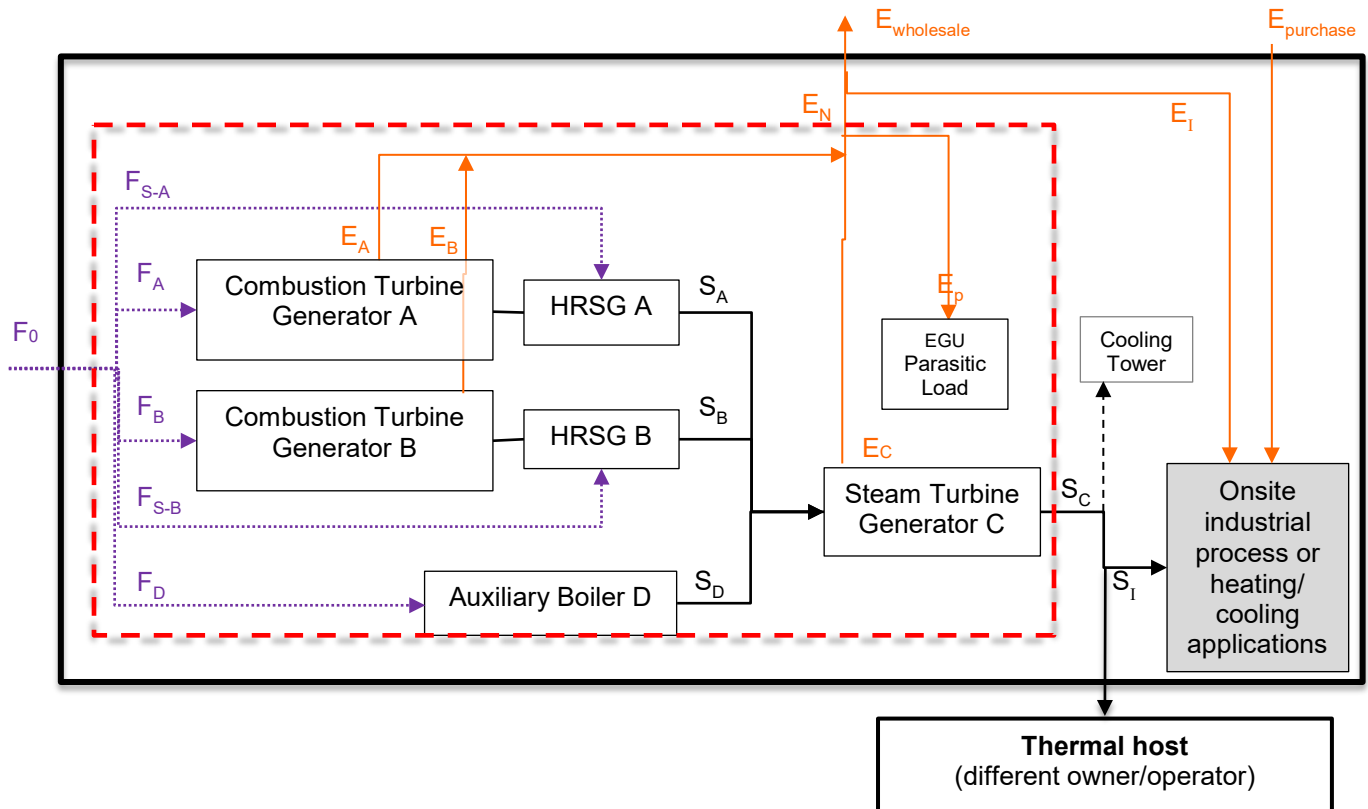
3. Which variables represent total thermal output (not just useful thermal output)?

*Answer: Total thermal output =  $S_C$ . The other variables  $S_A$ ,  $S_B$ , and  $S_D$  are within the system boundary and are used for additional power production in the STG before exiting the system as total thermal output ( $S_C$ ).*

4. Which emissions are reportable by the operator of the cogeneration facility?

*Answer: Cogeneration emissions are reported by the operator regardless of whether the thermal energy is used on-site or sold to a thermal host. If the thermal host is independently owned and operated, additional emission sources (not shown here) would be reported separately from the cogeneration operator's emissions data report.*

Reference: Electricity Generation and Cogeneration: Regulatory requirements and detailed examples for reporting. *Reporting Guidance for Electricity Generating Units*  
<https://ww2.arb.ca.gov/mrr-guidance>



The cooling tower is being shown outside of the red dashed line for the electricity generation boundary, so the thermal energy related to the cooling tower would be reported as thermal energy in support of power production.

The operator instead may have shown the cooling tower inside the electricity generation boundary. In this case, the thermal energy related to the cooling tower would not be separately reported as thermal energy in support of power production because it is inside the boundary. The choice is dependent on the metering at the facility.

[Example of how the math works for each scenario]

Cooling Tower (CT) Outside Boundary

Total thermal output (TTO) = CT + steam sold + steam used on-site  
(ignoring wasted energy)

$$100 = 10 + 40 + 50$$

Cooling Tower Inside Boundary (ignoring wasted energy)

TTO = sold + used

$$(100 - 10) = 40 + 50$$

**Handout 1-4.2**

**Example Cogeneration Facility Emissions Data Report**

**Facility Name:** \_\_\_\_\_

Facility ARB ID: \_\_\_\_\_

Facility Reporting Year: \_\_\_\_\_

**Facility or Entity Total GHG Emissions Summary**

CO2 equivalent emissions, excluding biogenic (subparts C – AA): \_\_\_\_\_ Metric Tons

Exempt biogenic CO2 emissions (subparts C – AA): 0 Metric Tons

Covered CO2 equivalent emissions: \_\_\_\_\_ Metric Tons

De Minimis CO2 equivalent emissions: \_\_\_\_\_ Metric Tons

Maximum allowable De Minimis emissions: \_\_\_\_\_ Metric Tons

**General Facility Reporting Information**

**NAICS Codes**

Primary: 221112 (Fossil Fuel Electric Power Generation)

**Natural Gas Purchases/Acquisitions for Reporting Facilities [95115(k), 95103(a)(1)]**

Natural Gas Supplier Name: \_\_\_\_\_

Supplier's ARB ID: \_\_\_\_\_

Customer Number: \_\_\_\_\_

Purchases/Acquisitions (MMBtu): \_\_\_\_\_

Was this natural gas received directly from an interstate pipeline? Yes

**Electricity Generation**

Facility has the capacity to generate electricity: Yes

Total Facility Nameplate Generating Capacity: \_\_\_\_\_ MW

Facility Type: Industrial/institutional/commercial facility with electricity generation capacity

Facility's Energy Disposition: Does not provide any generated energy outside of the facility boundary

**Disposition of Generated Electricity [95112(a)(4)]**

Generated Electricity for Grid Disposition [95112(a)(4)(A)]

Unit, System Or Group Name \_\_\_\_\_

Retail Provider/Marketer Name \_\_\_\_\_

Electricity Provided or Sold (MWh) \_\_\_\_\_

Generated electricity used for other on-site industrial processes that are not in support of or a part of the power generation system: \_\_\_\_\_

Reported emissions include emissions from a cogeneration/bigeneration unit: \_\_\_\_\_

Parasitic Steam Use: Generated thermal energy used for supporting power production (excluding steam used directly for generating electricity) [95112(a)(5)(B)]:

Generated thermal energy for on-site industrial applications not related to electricity generation [95112(a)(5)(C)]:

**Subpart C: General Stationary Fuel Combustion**

**Gas Information Details**

<b>Gas Name</b>	<b>Gas Quantity (Metric Tons)</b>
Methane	
Exempt Biogenic Carbon dioxide	
Nitrous Oxide	
Carbon Dioxide	
Total CO2e	

**Total Covered CO2e Emissions:** \_\_\_\_\_ (Metric Tons)

Emissions shown above that are claimed as De Minimis (CO2e): \_\_\_\_\_ Metric Tons

## Unit Details

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**Unit Name:** \_\_\_\_\_

Configuration Type: Single Unit Using Tiers 1, 2, or 3

Unit Type: IGCC (Integrated gasification combined cycle)

Unit Description:

### Individual Unit Details

Maximum Rated Heat Input Capacity: \_\_\_\_ mmBtu/hr

### Electricity Generation Unit Information

Does this configuration have the capacity to generate electricity? Yes

Is this configuration a Part 75 unit? No

Nameplate Generating Capacity: \_\_\_\_ MW

Prime Mover Technology: Single Cycle

Type of Thermal Energy Generation: \_\_\_\_\_

95112(b)(2): Gross Generation: \_\_\_\_ MWh

95112(b)(2): Net Generation: \_\_\_\_ MWh

95112(b)(3): Total Thermal Output (for Cogeneration or Bigeneration): \_\_\_\_ MMBtu

95112(b)(8): Other Steam Used for Electricity Generation:

95112(b)(8): Input Steam to the Steam Turbine (for bottoming cycle cogeneration units only)

95112(b)(8): Output of the Heat Recovery Steam Generator (for bottoming cycle cogeneration units only)

95112(e): Geothermal Steam Utilized:

95112(f): Stationary Hydrogen Fuel Cell: Fuel Type and Provider (if not reported elsewhere)

### Emission Details: Configuration-Level Summary (User entered values)

Total exempt annual biogenic CO<sub>2</sub> mass emissions (must equal the sum of calculated annual exempt biogenic CO<sub>2</sub>) (metric

Annual CO<sub>2</sub> emissions from sorbent (metric tons): \_\_\_\_

### Fuel-Specific Emissions Information

**Fuel: Natural Gas - Natural Gas**

Calculation Methodology: Tier 1 (Equation C-1b, natural gas billing in mmBtu)

Methodology Start Date: 2016-01-01

Methodology End Date: 2016-12-31

### Fuel Emission Details

Total CO<sub>2</sub> emissions: \_\_\_\_\_ Metric Tons

Total CH<sub>4</sub> emissions: \_\_\_\_ Metric Tons

Total N<sub>2</sub>O emissions: \_\_\_\_ Metric Tons

Total CH<sub>4</sub> emissions CO<sub>2</sub>e: \_\_\_\_ Metric Tons

Total N<sub>2</sub>O emissions CO<sub>2</sub>e: \_\_\_\_ Metric Tons

### Equation Inputs

Annual Natural Gas Usage: \_\_\_\_\_ MMBtu

Fuel Specific CO<sub>2</sub> Emissions Factor: 53.02 kg CO<sub>2</sub>/MMBtu

Fuel Specific CH<sub>4</sub> Emissions Factor: 0.001 kg CH<sub>4</sub>/MMBtu

Fuel Specific N<sub>2</sub>O Emissions Factor: 0.0001 kg N<sub>2</sub>O/MMBtu

Time And Date Report Generated: \_\_\_\_