

MRR Definitions that Refer to C&T Definitions (§95102(a) and §95802) and
Compliance Requirements for Covered Entities (§95850-§95852.2)

Article 5: California Cap on Greenhouse Gas Emissions and Market- Based Compliance Mechanisms to Allow for the Use of Compliance Instruments Issued by Linked Jurisdictions.

Sections included here:

Excerpts from § 95802. Definitions

Subarticle 3: Applicability

§ 95811. Covered Entities.

§ 95812. Inclusion Thresholds for Covered Entities.

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Definitions and Section from the Cap-and-Trade Regulation that are Referenced in the MRR:

All referenced definitions are from §95802 of the Cap-and-Trade Regulation:

§95802(a)(69) "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 CO₂e.

(70) "Compliance Obligation" means the quantity of verified reported emissions or assigned emissions for which an entity must submit compliance instruments to ARB.

(72) "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.

(84) "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.

(120) "Electrical Distribution Utility(ies)" means an entity that owns and/or operates an electrical distribution system, including: 1) a public utility as defined in the Public Utilities Code section 216 (referred to as an Investor Owned Utility or IOU); or 2) a local publicly owned electric utility (POU) as defined in Public Utilities Code section 224.3 or 3) an Electrical Cooperative (COOP) as defined in Public Utilities Code section 2776, that provides electricity to retail end users in California.

(123) "Eligible Renewable Energy Resource" has the same meaning as defined in Section 399.12 of the Public Utilities Code:

(e) "Eligible renewable energy resource" means an electrical generating facility that meets the definition of a "renewable electrical generation facility" in Section 25741 of the Public Resources Code, subject to the following:

(1) (A) An existing small hydroelectric generation facility of 30 megawatts or less shall be eligible only if a retail seller or local publicly owned electric utility procured the electricity from the facility as of December 31, 2005. A new hydroelectric facility that commences generation of electricity after December 31, 2005, is not

an eligible renewable energy resource if it will cause an adverse impact on instream beneficial uses or cause a change in the volume or timing of streamflow.

(B) Notwithstanding subparagraph (A), a conduit hydroelectric facility of 30 megawatts or less that commenced operation before January 1, 2006, is an eligible renewable energy resource. A conduit hydroelectric facility of 30 megawatts or less that commences operation after December 31, 2005, is an eligible renewable energy

resource so long as it does not cause an adverse impact on instream beneficial uses or cause a change in the volume or timing of streamflow.

(C) A facility approved by the governing board of a local publicly owned electric utility prior to June 1, 2010, for procurement to satisfy renewable energy procurement obligations adopted pursuant to former Section 387, shall be certified as an eligible renewable energy resource by the Energy Commission pursuant to this article, if the facility is a "renewable electrical generation facility" as defined in Section 25741 of the Public Resources Code.

(D) (i) A small hydroelectric generation unit with a nameplate capacity not exceeding 40 megawatts that is operated as part of a water supply or conveyance system is an eligible renewable energy resource only for the retail seller or local publicly owned electric utility that procured the electricity from the unit as of December

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31, 2005. No unit shall be eligible pursuant to this subparagraph if an application for certification is submitted to the Energy Commission after January 1, 2013. Only one retail seller or local publicly owned electric utility shall be deemed to have procured electricity from a given unit as of December 31, 2005.

(ii) Notwithstanding clause (i), a local publicly owned electric utility that meets the criteria of subdivision (j) of Section 399.30 may sell to another local publicly owned electric utility electricity from small hydroelectric generation units that qualify as eligible renewable energy resources under clause (i), and that electricity may be used by the local publicly owned electric utility that purchased the electricity to meet its renewables portfolio standard procurement requirements. The total of all those sales from the utility shall be no greater than 100,000 megawatt hours of electricity.

(iii) The amendments made to this subdivision by the act adding this subparagraph are intended to clarify existing law and apply from December 10, 2011.

(2) A facility engaged in the combustion of municipal solid waste shall not be considered an eligible renewable energy resource unless it is located in Stanislaus County and was operational prior to September 26, 1996.

(211) “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.

(310) “Qualified Export” means electricity that is exported in the same hour as imported electricity and documented by NERC E-tags. When imports are not documented on NERC E-tags, because a facility or unit located outside the state of California has a first point of interconnection with a California balancing authority area, the reporting entity may demonstrate hourly electricity delivery consistent with the record keeping requirements of the California balancing authority area, including records of revenue quality meter data, invoices, or settlements data. Only electricity exported within the same hour and by the same importer as the imported electricity is a qualified export. It is not necessary for the imported and exported electricity (as defined in the MRR) to enter or leave California at the same intertie. Qualified exports shall not result in a negative compliance obligation for any hour.

§ 95811. Covered Entities.

This article applies to all of the following entities with associated GHG emissions pursuant to section 95812:

- (a) Operators of Facilities. The operator of a facility within California that has one or more of the following processes or operations:
 - (1) Cement production;
 - (2) Cogeneration;
 - (3) Glass production;
 - (4) Hydrogen production;
 - (5) Iron and steel production;
 - (6) Lead Production;
 - (7) Lime manufacturing;
 - (8) Nitric acid production;
 - (9) Petroleum and natural gas systems, as specified in section 95852(h);

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- (10) Petroleum refining;
 - (11) Pulp and paper manufacturing;
 - (12) Self-generation of electricity; or
 - (13) Stationary combustion.
- (b) First Deliverers of Electricity.
- (1) Electricity generating facilities: the operator of an electricity generating facility located in California; or
 - (2) Electricity importers.
- (c) Suppliers of Natural Gas. An entity that distributes or uses natural gas in California as described below:
- (1) A public utility gas corporation operating in California;
 - (2) A publicly owned natural gas utility operating in California; or
 - (3) The operator of an intrastate pipeline not included in section 95811(c)(1) or section 95811(c)(2) that distributes natural gas directly to end users.
- (d) Suppliers of RBOB and Distillate Fuel Oil. A position holder of one or more of the following fuels, or an enterer that imports one or more of the following fuels into California:
- (1) RBOB;
 - (2) Distillate Fuel Oil No. 1; or
 - (3) Distillate Fuel Oil No. 2.
- (e) Suppliers of Liquefied Petroleum Gas.
- (1) The operator of a refinery that produces liquid petroleum gas in California;
 - (2) The operator of a facility that fractionates natural gas liquids to produce liquid petroleum gas; or
 - (3) A consignee of liquefied petroleum gas into California as defined under MRR.
- (f) Sections 95811(c), (d), and (e) apply to suppliers of blended fuels that contain the fuels listed above.
- (g) Suppliers of Liquefied Natural Gas.
- (1) Operators of liquefied natural gas production facilities that produce liquefied natural gas products from natural gas received from interstate pipelines as described in section 95122 of MRR;
 - (2) Importers of liquefied natural gas.
- (h) Carbon dioxide suppliers.

§ 95812. Inclusion Thresholds for Covered Entities.

- (a) The inclusion threshold for each covered entity is based on the subset of greenhouse gas emissions that generate a compliance obligation for that entity as specified in section 95852. The entity must report and verify annual emissions pursuant to sections 95100 through 95157 of MRR.
- (b) If an entity's reported or reported and verified annual emissions in any data year from 2009 through 2012 from the categories specified in section 95852(a) or (b) equal or exceed the thresholds identified below, that entity is classified as a covered entity as of January 1, 2013, and for all future years until any requirement set forth in section 95812(e) is met.
- (c) The requirements apply as follows:
 - (1) Operators of Facilities. The applicability threshold for a facility is 25,000 metric tons or more of CO₂e per data year.
 - (2) First Deliverers of Electricity.
 - (A) Electricity Generating Facilities. The applicability threshold for an electricity generating facility is based on the annual emissions from which the electricity originated. The applicability threshold for an electricity generating facility is 25,000 metric tons or more of CO₂e per data year.
 - (B) Electricity importers. The applicability threshold for an electricity importer is based on the annual emissions from each of the electricity importer's sources of delivered electricity.
 - 1. All emissions reported for imported electricity from specified sources of electricity that emit 25,000 metric tons or more of CO₂e per year are considered to be above the threshold.
 - 2. All emissions reported for imported electricity from unspecified sources are considered to be above the threshold.
 - (3) Carbon Dioxide Suppliers. The applicability threshold for a carbon dioxide supplier is 25,000 metric tons or more of CO₂e per year. For purpose of comparison to this threshold, the supplier must include the sum of the CO₂ that it captures from its production process units for purposes of supplying CO₂ for commercial applications or that it captures from a CO₂ stream to utilize for geologic sequestration, and the CO₂ that it extracts or produces from a CO₂ production well for purposes of supplying for commercial applications or that it extracts or produces to utilize for geologic sequestration.

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- (4) Petroleum and Natural Gas Facilities. The applicability threshold for a petroleum and natural gas facility 25,000 metric tons or more of CO₂e per data year. This threshold is applied for each facility type specified in section 95852(h).
- (d) If an entity's annual, assigned, or reported and verified emissions from any data year between 2011-2014 equal or exceed the thresholds identified below from the categories specified in sections 95851(a), (b), and (d) then that entity is classified as a covered entity as of January 1, 2015, for the year in which the threshold is reached and for all future years until any requirement set forth in section 95812(e) is met.
 - (1) Fuel Suppliers. The threshold for a fuel supplier is 25,000 metric tons or more of CO₂e annually from the emissions of GHG that would result from full combustion or oxidation of the quantities of the fuels, identified in section 95811(c) through (g), which are imported and/or delivered to California.
 - (2) Electricity importers. The threshold for an electricity importer of specified source of electricity is zero metric tons of CO₂e per year and for unspecified sources is zero MWhs per year as of January 1, 2015.
 - (3) Waste-to-Energy-Facilities. If a waste-to-energy facility's annual, assigned, or reported and verified emissions from any data year between 2011-2015 equal or exceed 25,000 metric tons or more of CO₂e annually, then that entity is classified as a covered entity as of January 1, 2016, for the year in which the threshold is reached and for all years until the requirement set forth in section 95812(e) is met.
- (e) Effect of Reduced Emissions on an Entity's Compliance Obligation. A covered entity continues to have a compliance obligation for each data year of a compliance period, until the subsequent compliance period after one of the following conditions occurs:
 - (1) Annual reports demonstrate GHG emissions less than 25,000 metric tons of CO₂e per year during one entire compliance period; or
 - (2) A covered entity has ceased reporting and shuts down all processes, units, and supply operations subject to reporting, and has followed the requirements of section 95101(h) of MRR.
- (f) If a covered entity or opt-in covered entity ceases all operation or "shuts down," the following shall apply:
 - (1) The entity must comply with MRR cessation of reporting provisions per 95101(h).
 - (2) Within 30 days of shut down, the entity must inform ARB in writing that it has shut down. If not part of a consolidated tracking system account, the entity will become a voluntarily associated entity. If part of a consolidated tracking system account, the entity that has shut down will become a voluntarily associated entity within the consolidated tracking system account.

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- (3) For a formerly covered or opt-in covered entity, within 30 days of fulfilling its compliance obligation for its final year of operations, the entity must request (in writing) permission from ARB to:
- (A) remain in the tracking system account as a voluntarily associated entity pursuant to 95814(a)(1), or
 - (B) close its tracking system account (if not part of a consolidated tracking system account), or remove the covered entity or opt-in covered entity from its tracking system account (if part of a consolidated tracking system account).
- (4) Return of future free allocation. If an entity received allocation of a vintage subsequent to the calendar year that the facility ceased operation, the facility shall return to the Executive Officer the number of allowances equal to the directly allocated allowances for the corresponding budget years in which it had no production. The submission of request to return allowances must occur within five days of settlement of the first auction or reserve sale conducted by ARB following the applicable surrender date, whichever is later, and for which the registration deadline has not passed at the time of the final compliance obligation for its final year of operation. The returned allowances will be auctioned pursuant to section 95910.
- (5) Prorated final free allocation. In calendar year following shut down, if a facility receives allocation that includes a true-up pursuant to sections 95852(k), 95870(e), 95870(f), 95891(b), 95891(c), 95891(d), 95891(e), or 95894(c) only the true-up shall be calculated. This value shall include any previous negative balance of allowance allocation pursuant to 95870(i).
- (A) If true-up is positive, the calculated true-up amount shall be directly distributed to the facility in the vintage of the calendar year following shut down.
 - (B) If true-up is negative, the facility shall return to the Executive Officer the number of allowances equal to the negative amount in the vintage of or before the calendar year following shut down. The submission for retirement must occur within five days of settlement of the first auction or reserve sale conducted by ARB following the applicable surrender date, whichever is later, and for which the registration deadline has not passed at the time of the final compliance obligation for its final year of operation. The Executive Officer will auction the returned allowances pursuant to section 95910.
- (6) If the entity requests that ARB close its account in the tracking system and there are compliance instruments remaining in the entity's accounts, ARB will auction the allowances pursuant to 95831(c)(4).

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- (g) Change of Entity Type. At the end of any compliance period, a covered entity may apply to change its entity type in the program, if its annual emission levels for each year in the compliance period remain below the inclusion thresholds set forth in section 95812. This application must be made to the Executive Officer by September 1 of the last calendar year of the compliance period. If an entity does not apply to the Executive Officer, the facility will automatically become an voluntarily associated entity pursuant to 95812(g)(2). A covered entity that applies to change its entity type may choose one of the following:
- (1) Remain in the Cap-and-Trade Program as an opt-in covered entity pursuant to 95813;
 - (2) Remain in the Cap-and-Trade Program as a voluntarily associated entity pursuant to 95814;
 - (A) If the entity has a negative balance of allowance allocation pursuant to 95870(i), the entity shall submit to the Executive Officer for the retirement of the number of allowances equal to the negative amount in the vintage of or before the final calendar year of the compliance period. The submittal for retirement must occur within five days of settlement of the first auction or reserve sale conducted by ARB following the applicable surrender date, whichever is later, and for which the registration deadline has not passed at the time of the final compliance obligation for its final year of operation.
 - (3) Opt out of the Cap-and-Trade Program.
 - (A) An entity choosing to opt out of the program must continue to report pursuant to MRR in the calendar year following the final year of a compliance period and fulfill its compliance obligations as required pursuant to 95856.
 - (B) If the entity has a negative balance of allowance allocation pursuant to 95870(i), the entity shall return to the Executive Officer the number of allowances equal to the negative amount in the vintage of or before the final calendar year of the compliance period. The submittal for retirement must occur within five days of settlement of the first auction or reserve sale conducted by ARB following the applicable surrender date, whichever is later, and for which the registration deadline has not passed at the time of the final compliance obligation for its final year of operation.
 - (C) If the entity closes its account in the tracking system and there are compliance instruments remaining in the entity's accounts, ARB will auction the allowances pursuant to 95831(c)(4).

§ 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 CO₂e 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 CO₂e 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 natural gas liquids are not included when calculating an operator's compliance obligation.
- (b) First Deliverers of Electricity. A first deliverer of electricity covered under sections 95811(b) and 95812(c)(2) has a compliance obligation for every metric ton of CO₂e emissions calculated pursuant to section 95852(b)(1) for which a positive or qualified positive emissions data verification statement is issued pursuant to MRR, or for which there are assigned emissions, when such emissions are from a source in California or in a jurisdiction where a GHG emissions trading system has not been approved for linkage by the Board pursuant to subarticle 12.
- (1) Calculation of emissions for compliance obligation.
- (A) For first deliverers that are operators of an electricity generating facility in California, the calculation for compliance obligation includes all emissions reported and verified or assigned pursuant to MRR, except emissions without a compliance obligation pursuant to section 95852.2.
- (B) For first deliverers that are electricity importers, emissions with a compliance obligation are calculated using the following equation:

Where:

$$CO_2e_{covered} = CO_2e_{unspecified} + (CO_2e_{specified} - CO_2e_{specified-not\ covered}) - CO_2e_{RPS_adjustment} - CO_2e_{QE_adjustment} - CO_2e_{linked}$$

CO₂e_{covered} = Annual metric tons of CO₂e with a compliance obligation. CO₂e_{unspecified} = Annual metric tons of CO₂e from unspecified imported electricity calculated pursuant to MRR 95111(b)(1).

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$\text{CO}_2\text{e}_{\text{specified}}$ = Annual metric tons of CO_2e from imported electricity from specified sources that meet the requirements of MRR section 95111(b)(1).

$\text{CO}_2\text{e}_{\text{specified-not covered}}$ = Annual metric tons of CO_2e without a compliance obligation pursuant to section 95852.2. from specified sources that meet the requirements in MRR section 95111(b)(1).

$\text{CO}_2\text{e}_{\text{RPS_adjustment}}$ = Annual metric tons of CO_2e calculated pursuant to MRR that meets the requirements of section 95852(b)(4).

$\text{CO}_2\text{e}_{\text{QE_adjustment}}$ = Annual metric tons of CO_2e from qualified exports pursuant to MRR section 95111 that meet the requirements of section 95852(b)(5).

$\text{CO}_2\text{e}_{\text{linked}}$ = Annual metric tons of CO_2e from electricity with a first point of receipt located in a jurisdiction where a GHG emissions trading system has been approved for linkage by the Board pursuant to subarticle 12.

- (C) All deliveries of electricity not meeting the requirements for specified sources pursuant to MRR will have emissions calculated using the default emission factor for unspecified electricity pursuant to section MRR 95111(b)(1).
- (2) Resource shuffling is prohibited and is a violation of this article.
 - (A) The following substitutions of electricity deliveries from a lower emission resource for electricity deliveries from a higher emission resource shall not constitute resource shuffling:
 1. Electricity deliveries that are caused by the procurement of electricity eligible to be counted towards and purchased for Renewable Portfolio Standard (RPS) compliance in California.
 2. Electricity deliveries made for the purpose of compliance with state or federal laws and regulations, including the Emission Performance Standard (EPS) rules established by CEC and the CPUC pursuant to public utilities code section 8340 et. seq.
 3. Electricity deliveries made for the purpose of compliance with requirements related to maintaining reliable grid operations, such as North American Electric Reliability Corporation (NERC) Reliability Standards, and Reliability Coordinator directives, including the provision of electricity between balancing authorities or load-serving entities when required to alleviate emergency grid conditions.
 4. Electricity deliveries made for the purpose of compliance with either a judicially approved settlement of litigation or a settlement of a transaction dispute

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pursuant to the dispute resolution terms and conditions of a contract for reasons other than reducing GHG compliance obligations.

5. Electricity deliveries that substitute for power previously supplied by a specified source that has been retired.
6. Electricity deliveries that substitute for deliveries that have been discontinued because of termination of a contract or divestiture of resources for reasons other than reducing a GHG compliance obligation.
7. Electricity deliveries that are necessitated by early termination of a contract for, or full or partial divestiture of, resources subject to the EPS rules.
8. Electricity deliveries that are necessitated by expiration of a contract.
9. Electricity deliveries pursuant to contracts for short-term delivery of electricity with terms of no more than 12 months, for either specified or unspecified power, linked to the selling off of power from, or assigning of a contract for, electricity subject to the EPS rules from a power plant that does not meet the EPS with which a California Electrical Distribution Utility has a contract, or in which a California Electrical Distribution Utility has an ownership share, and based on economic decisions including congestion costs but excluding implicit and explicit GHG costs. In evaluating these short-term deliveries of electricity, ARB will consider the levels of past sales and purchases from similar resources of electricity, among other factors, to judge whether the activity is resource shuffling.
10. Short-term transactions and contracts for delivery of electricity with terms of no more than 12 months, or resulting from an economic bid or self-schedule that clears the CAISO day-ahead or real-time market, for either specified or unspecified power, based on economic decisions including implicit and explicit GHG costs and congestion costs, unless such activity is linked to the selling off of power from, or assigning of a contract for, electricity subject to the EPS rules from a power plant that does not meet the EPS with which a California Electricity Distribution Utility has a contract, or in which a California Electricity Distribution Utility has an ownership share, that is not covered under paragraphs 11., 12., or 13. below.
11. Electricity deliveries that are necessitated by operational emergencies or transmission or distribution constraints, including constraints caused by the inability to obtain or retain transmission rights, transmission curtailments or outages, or emergencies.

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12. Electricity deliveries that are necessitated because a First Deliverer has more than enough electricity to meet demand as a result of the First Deliverer being required to take electricity from specific generating units, including requirements due to electricity contracts with “must-take” or “must-run” provisions.
 13. Deliveries of electricity that are required to make up for transmission losses associated with electricity deliveries in California.
- (B) Prohibited substitutions of electricity deliveries from a higher emission resource with electricity deliveries from a lower emission resource include:
- (1) Substituting relatively lower emission electricity to replace electricity generated at a high emission power plant procured by a First Deliverer under a long-term contract or ownership arrangement, when the power plant does not meet California’s EPS, and the substitution is made to reduce a First Deliverer’s compliance obligation.
 - (2) Assigning a long-term contract for high emission electricity specified in section 95852(b)(2)(B)1. directly above to a third party, for the purpose of reducing a compliance obligation.
- (3) The following criteria must be met for electricity importers to claim a compliance obligation for delivered electricity based on a specified source emission factor or asset controlling supplier emission factor.
- (A) Electricity deliveries must be reported to ARB and emissions must be calculated pursuant to MRR section 95111.
 - (B) The electricity importer must be the facility operator or have right of ownership or a written power contract, as defined in MRR section 95102(a), to the amount of electricity claimed and generated by the facility or unit claimed;
 - (C) The electricity must be directly delivered, as defined in MRR section 95102(a), to the California grid; and
 - (D) If RECs were created for the electricity generated and reported pursuant to MRR, then the REC serial numbers must be reported and verified pursuant to MRR.
- (4) RPS adjustment. Electricity procured from an eligible renewable energy resource reported pursuant to MRR must meet the following conditions to be included in the calculation of the RPS adjustment:
- (A) The electricity importer must have:
 1. Ownership or contract rights to procure the electricity

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- and the associated RECs generated by the eligible renewable energy resource;
or
2. A contract with an entity subject to the California RPS that has ownership or contract rights to the electricity and associated RECs generated by the eligible renewable energy resource, as verified pursuant to MRR.
- (B) The RECs associated with the electricity claimed for the RPS adjustment must be placed in the retirement subaccount of the entity subject to the California RPS, and party to the contract in 95852(b)(4)(A), in the accounting system established by the CEC pursuant to PUC 399.25, and designated as retired for the purpose of compliance with the California RPS program within 45 days of the reporting deadline specified in section 95111(g) of MRR for the year for which the RPS adjustment is claimed.
- (C) The quantity of emissions included in the RPS adjustment is calculated as the product of the default emission factor for unspecified sources, pursuant to MRR, and the reported electricity generated (MWh) that meets the requirements of this section, 95852(b)(4).
- (D) No RPS adjustment may be claimed for an eligible renewable energy resource when its electricity is directly delivered.
- (E) No RPS adjustment may be claimed for electricity generated by an eligible renewable energy resource in a jurisdiction where a GHG emissions trading system has been approved for linkage by the Board pursuant to subarticle 12.
- (F) Only RECs representing electricity generated after 12/31/2012 are eligible to be used towards the RPS adjustment.
- (5) QE adjustment. An adjustment to the compliance obligation pursuant to the calculation in 95852(b)(1) may be made for exported and imported electricity during the same hour by the same PSE. Emissions included in the QE adjustment for qualified exports claimed by a first deliverer must meet the following requirements:
- (A) During any hour in which an electricity importer claims qualified exports and corresponding imports, the maximum amount of QE adjustment for the hour shall not exceed the product of:
 1. The lower of either the quantity of exports or imports (MWh) for the hour; multiplied by
 2. The lowest emission factor of any portion of the qualified exports or corresponding imports for the hour.

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- (B) Emissions and MWhs included in the QE adjustment must be reported and verified or assigned pursuant to MRR, and must be documented by hourly import and export data pursuant to MRR.
- (c) Suppliers of Natural Gas. A supplier of natural gas covered under sections 95811(c) and 95812(d) has a compliance obligation for every metric ton CO₂e of GHG emissions that would result from full combustion or oxidation of all fuel delivered to end users in California contained in an emissions data report that has received a positive or qualified positive emissions data verification statement or for which emissions have been assigned, less the fuel that is delivered to covered entities, as follows:
- (1) Suppliers of natural gas shall report the total metric tons CO₂e of GHG emissions delivered to all end users in California pursuant to section 95122 of MRR;
 - (2) ARB shall calculate the metric tons CO₂e of GHG emissions for natural gas delivered to covered entities which are customers of the supplier. The emissions will be calculated using the reported deliveries (in MMBtu) contained in natural gas supplier emissions data reports that received a positive or qualified positive emissions data verification statement. Natural gas received data (in MMBtu) contained in covered facility emissions data reports that received positive or qualified positive emissions data verification statements will be used to cross check delivery data reported by natural gas suppliers, and will serve as a second source of data in instances of missing supplier data. In the event that a natural gas supplier receives an adverse verification statement, ARB will use the provisions described in section 95131(c)(5) of the MRR to calculate the supplier's assigned emission level;
 - (3) ARB shall provide the supplier of natural gas a listing of all customers and aggregate natural gas (in MMBtu) and emissions calculated from the supplier's natural gas delivered to covered entities; and
 - (4) The Executive Officer shall calculate the metric tons CO₂e for which the supplier will be required to hold a compliance obligation based on the supplier's reported emissions less ARB's calculated emissions from deliveries to covered entities which are customers of the supplier. The Executive Officer shall provide this value to the supplier of natural gas within 30 days of the verification deadline in section 95103 of MRR.
- (d) Suppliers of RBOB and Distillate Fuel Oils. A supplier of petroleum products covered under sections 95811(d) or 95812(d) has a compliance obligation for every metric ton CO₂e of GHG emissions included in an emissions data report that has received a positive or qualified positive emissions data verification

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statement or for which emissions have been assigned that would result from full combustion or oxidation of the quantities of the following fuels that are removed from the rack in California, sold to entities not licensed by the California Board of Equalization as a fuel supplier, or imported into California and not directly delivered to the bulk-transfer/terminal system as defined in section 95102 of MRR, except for products for which a final destination outside California can be demonstrated:

- (1) RBOB;
 - (2) Distillate Fuel Oil No. 1; and
 - (3) Distillate Fuel Oil No. 2.
- (e) Suppliers of Liquefied Petroleum Gas:
- (1) A producer of liquefied petroleum gas covered under sections 95811(e) and 95812(d) has a compliance obligation for every metric ton CO₂e of GHG emissions included in an emissions data report that has received a positive or qualified positive emissions data verification statement or for which emissions have been assigned that would result from full combustion or oxidation of all fuel sold, distributed, or otherwise transferred for consumption in California; and
 - (2) An importer consignee, as defined under MRR, of liquefied petroleum gas covered under section 95811(e) has a compliance obligation for every metric ton CO₂e of GHG emissions included in an emissions data report that has received a positive or qualified positive emissions data verification statement or for which emissions have been assigned that would result from full combustion or oxidation of all fuel imported into California.
- (f) Suppliers of Blended Fuels. An entity that supplies any of the fuels covered under sections 95811(f) and 95812(d) as blended fuels has an aggregated compliance obligation for every metric ton of CO₂e of GHG emissions based on the separate constituents of the blend included in an emissions data report that has received a positive or qualified positive emissions data verification statement or for which emissions have been assigned that would result from full combustion or oxidation of the fuel.
- (g) Carbon Dioxide Suppliers. An entity that supplies carbon dioxide, "Carbon Dioxide Supplier" or CO₂ Supplier", covered under sections 95811(h) and 95812(c)(3) has an aggregated compliance obligation based on the sum of MT CO₂ included in an emissions data report that has received a positive or qualified positive emissions data verification statement or for which emissions have been assigned minus exported CO₂ that is not geologically sequestered, and minus CO₂ verified to be geologically sequestered through use of a Board-approved carbon capture and geologic sequestration quantification methodology that ensures that the emissions reductions are real,

Course 1.1: Handout 1.1.2: Cap-and-Trade Regulation Excerpts

permanent, quantifiable, verifiable, and enforceable. Emissions of CO₂ already covered with a compliance obligation upstream are not included.

- (h) Petroleum and Natural Gas Systems. Operators of the facilities specified in section 95101(e)(2)-(5) of MRR have a compliance obligation for every metric ton of CO₂e from the source types specified in sections 95152(c)-(f) of MRR, except as specified in section 95852.2 of this article, that is contained in an emissions data report that has received a positive or qualified positive emissions data report, or for which emissions have been assigned.
- (i) The compliance obligation for sources specified in sections 95852(a) through (h), and 95852(l) is calculated based on the sum of the following, as applicable:
 - (1) Emissions of CO₂, CH₄, and N₂O which resulted from combustion of fossil fuel;
 - (2) Emissions of CH₄ and N₂O which resulted from combustion of all biomass- derived fuel;
 - (3) Emissions of CO₂ which resulted from combustion of biomass-derived fuels that do not meet the requirements in section 95852.2(a);
 - (4) Emissions of CO₂ which resulted from combustion of biomass-derived fuels pursuant to section 95852.1; and
 - (5) All process and vented emissions of CO₂, CH₄, and N₂O as specified in the MRR except for those listed in section 95852.2(b).
- (j) Limited Exemption of Emissions from the Production of Qualified Thermal Output During the First, Second, and Third Compliance Periods. During the first, second, and third compliance periods, emissions from the production of qualified thermal output from a district heating facility or a facility with a cogeneration unit that meets the requirements of this section and has been approved by the Executive Officer for an emissions exemption shall not have a compliance obligation and shall not count toward the inclusion threshold of section 95812(c)(1). A facility that qualifies for this limited exemption shall not be a covered entity during the first, second, and third compliance periods.
 - (1) A facility with a cogeneration unit may apply for the emissions exemption if it meets the following two conditions for each year from 2008-2013, starting with the first year that a cogeneration unit was operational at the facility, and will remain eligible until the year in which either condition is not met, based on data reported pursuant to MRR:
 - (A) The facility's annual covered emissions as defined in MRR associated with the production of qualified thermal output, calculated using the following equation, are less than 25,000 metric tons of CO₂e:

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$$GHG_{QTO} = Q_{produced} * 0.06244$$

Where:

“GHG_{QTO}” is the annual covered emissions for each calendar year, in metric tons of CO₂e, associated with the production of qualified thermal output;

Q_{produced} is the annual amount of qualified thermal output produced for each calendar year, from fuels that result in covered emissions, measured in MMBtu, at the cogeneration facility. If Q_{produced} is produced from a cogeneration unit that burns both fuels that result in covered emissions and fuels that result in emissions without a compliance commission pursuant to Subarticle 7, then Q_{produced} is calculated as total qualified thermal output multiplied by the ratio of the MMBtus of fuel that produces covered emissions divided by the total MMBtus of all fuels combusted in the unit; and,

- (B) The facility’s remaining covered emissions, calculated pursuant to the following equation, are less than 25,000 metric tons of CO₂e:

$$GHG_R = GHG_{Total} - GHG_{QTO}$$

Where:

“GHG_R” is the annual remaining covered emissions, in metric tons of CO₂e.

“GHG_{Total}” is total annual covered emissions, in metric tons of CO₂e.

- (2) A district heating facility may apply for the qualified thermal output emissions exemption if the annual emissions associated with qualified thermal output distributed to each single facility on its system do not exceed 25,000 MTCO₂e for each year from 2008 to 2013, and will remain eligible until the year in which this condition is not met:
- (A) Emissions associated with a single facility are calculated using the following equation:

$$GHG_{sf} = Q_{sf} * 0.06244$$

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Where:

“GHG_{Sf}” is the emissions associated with a single facility.

“Q_{Sf}” is the amount of Qualified Thermal Output provided to a single facility, measured in MMBtu.

- (3) Data Sources. The Executive Officer may employ all available data reported to ARB under MRR for data years 2008-2013 to determine a facility's initial eligibility for the limited exemption of emissions from the production of qualified thermal output.
- (4) A facility with a cogeneration unit or a district heating facility must apply to the Executive Officer for the emissions exemption by providing the following data by September 2, 2014:
 - (A) Annual qualified thermal output for each year from 2008 to 2013, in MMBtu.
 - (B) A district heating facility must provide the amount of qualified thermal output provided to each single facility it serves.
 - (C) The application must include the following attestation:

“I certify under penalty of perjury of the laws of the State of California that I am duly authorized by [name of entity] to sign this attestation on behalf of [name of entity], and that the information submitted herein is true, accurate, and complete.”
 - (D) Operators of facilities that meet the requirements of this section must register in the tracking system pursuant to section 95830.
 - (E) Operators of facilities that meet the requirements of this section must report and verify emissions pursuant to MRR.
- (k) Limited Exemption of Emissions for Waste-to-Energy Facilities. Emissions reported and verified in the first compliance period and in data year 2015 for the direct combustion of municipal solid waste in a waste-to-energy facility that had started operations before 2009 and that meets the requirements of this section do not have a compliance obligation and shall not count toward the inclusion threshold of section 95812(d)(3). The exempted waste-to-energy facility must meet the following criteria:
 - (1) Operators of Waste-to-Energy Facilities must register in the tracking system pursuant to section 95830;
 - (2) Report and verify emissions pursuant to MRR;
 - (3) Must be operating under a current permit issued by the local Air Pollution Control District or Air Quality Management District; and

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- (4) Fuel must be derived from municipal solid waste, as defined in the section 95802 of this article and MRR.
- (5) The Executive Officer will place the number of true-up allowances equal to the facility's reported, verified, and covered emissions from municipal solid waste for the 2013, 2014, and 2015 data years into their compliance account. These allowances will be used to meet the facility's 2013, 2014, and 2015 compliance obligations. The 2015 vintage true-up allowances will be deposited by October 24, 2014 for the 2013 data year's reported and verified emissions. The 2016 vintage true-up allowances will be deposited by October 24, 2015 for the 2014 year's reported and verified emissions. The 2017 vintage true-up allowances will be deposited by October 24, 2016 for the 2015 data year's reported and verified emissions. The Executive Officer will retire the allowances placed into the account according to the surrender dates in section 95856.
- (l) Suppliers of Liquefied Natural Gas. A supplier of liquefied natural gas covered under sections 95811(g) or 95812(d) has a compliance obligation for every metric ton CO₂e of GHG emissions included in an emissions data report that has received a positive or qualified positive emissions data verification statement or for which emissions have been assigned that would result from full combustion or oxidation of the quantities on liquefied natural gas or compressed natural gas imported into California, except for products for which a final destination outside California can be demonstrated.

§ 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 CO₂e emissions:

- (a) From combustion of fuel types that are not listed under section 95852.2; or
- (b) From combustion of fuels that do not meet the requirements of section 95852.1.1; or
- (c) That are reported as non-exempt biomass derived CO₂ 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 CO₂ 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 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 CO₂ emissions from complete combustion of the fuel, result in more CO₂e 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 CO₂e 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 CO₂e 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 CO₂ under MRR. Emissions without a compliance obligation include:

- (a) CO₂ 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.
 - (5) Biodiesel:
 - (A) Agri-biodiesel derived solely from virgin oils, including esters derived from virgin vegetable oils from corn, soybeans, sunflower seeds,

Course 1: Handout 1.1.2—Referenced Sections of the Cap-and-Trade Regulation

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.

- (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) Emissions from natural gas hydrogen fuel cells;
- (3) Vented and fugitive emissions from storage tanks used in petroleum and natural gas production and natural gas transmission;
- (4) Vented and fugitive emissions reported under sections 95152(e) and (i) of MRR by local distribution companies that report under section 95122 of MRR;
- (5) 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;

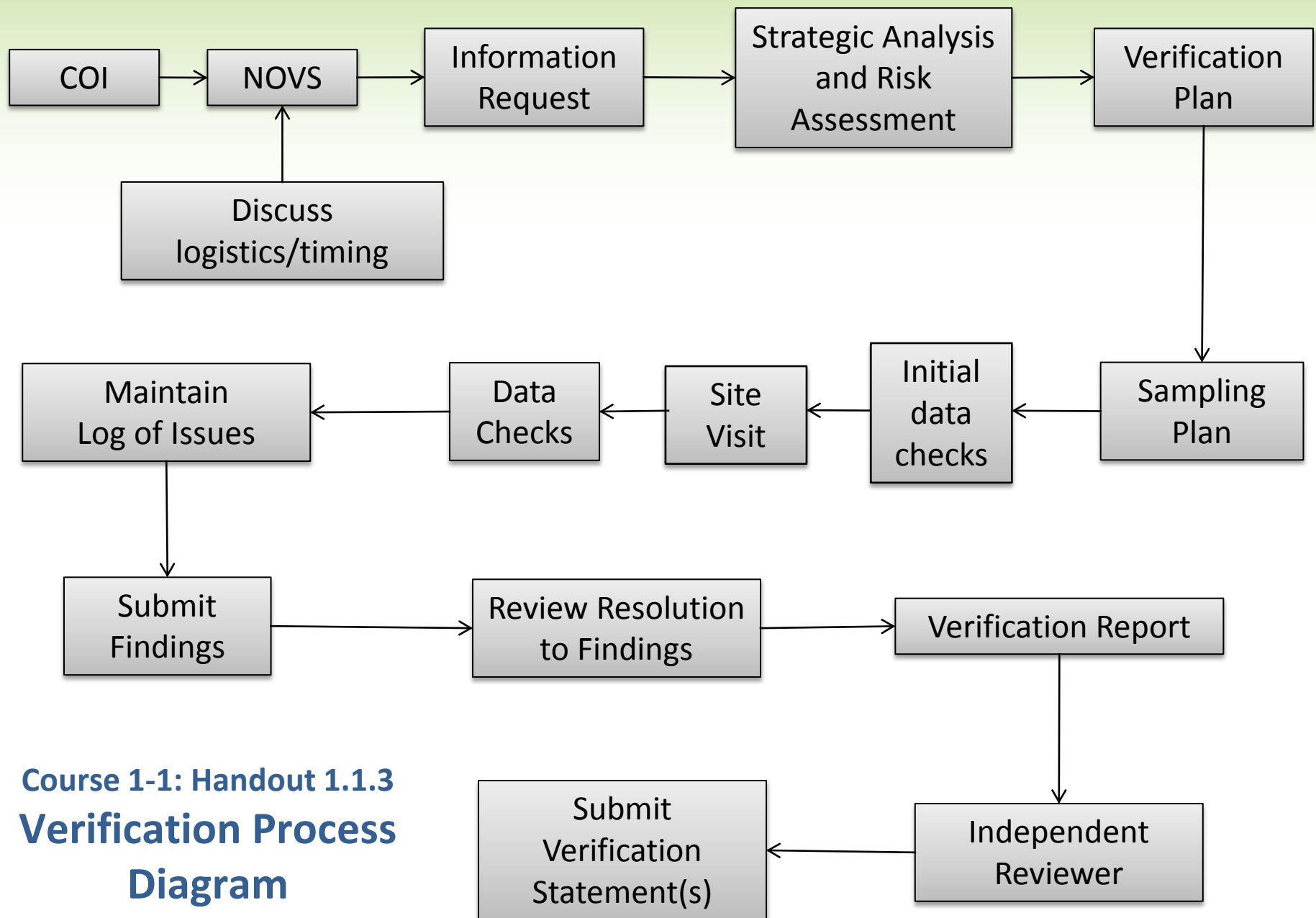
Course 1: Handout 1.1.2—Referenced Sections of the Cap-and-Trade Regulation

- (6) Emissions reported by petroleum refineries from asphalt blowing operations, equipment leaks, storage tanks, and loading operations;
 - (7) Emissions from low bleed pneumatic devices;
 - (8) Emissions from high bleed pneumatic devices reported prior to January 1, 2015;
 - (9) Vented emissions from well-site centrifugal and reciprocating compressors with a rated horsepower less than 250hp;
 - (10) 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;
 - (11) Sources for which emissions originate from offshore petroleum and natural gas production facilities, as provided in section 95153(q) of MRR;
 - (12) Carbon dioxide that is exported for purposes other than geologic sequestration or enhanced oil recovery; and
 - (13) Carbon dioxide used in the carbonation process during sugar production in facilities with NAICS code 311313.
- (c) Other Exemptions. The operators of facilities with any of the following activities are exempt from compliance with this article:
- (1) NAICS Code 92811.

§ 95840. Compliance Periods.

Duration of Compliance Periods is as follows:

- (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.



Course 1-1: Handout 1.1.3
Verification Process
Diagram

Course 1-1: Handout 1.1.4 Issues Log Examples

ABC Verification Company, Inc.						
Two Issues Logs for Verification of ACME Combustion (2014)						
Reporting Entity: ACME Combustion (ARB ID# 100999)						
Subparts Reported: C						
Year of Emissions Data: 2014						
Lead Verifier: Mary Smith						
#	Date	Description of Issue/Source	Regulation Citation	Potential Impact upon GHG Data	Action Required by Reporting Entity	Resolution
1	4/23/2014	GHG Monitoring Plan (1)	MRR §95105 (2)	Meter and calibration issues may affect report. (3)	Correct error. (4)	Resolved. (5)
2	5/15/2014	Propane heaters (6)	MRR §95115 (7)	Non-conformance (8)	Report emissions from propane as De Minimis.(9)	Reporter used verifier calculations (10)
3	5/15/2014	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 5/30/2014. Please contact ARB staff if you have questions about which Tier to use to report your emissions data.	<u>Resolved on 5/25 via email.</u> 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).

Reporting Entity: ACME Combustion (ARB ID# 100999)						
Subparts Reported: C						
Year of Emissions Data: 2014						
Lead Verifier: Mary Smith						
#	Date	Description of Issue/Source	Regulation Citation	Potential Impact upon GHG Data	Action Required by Reporting Entity	Resolution
1	4/23/2015	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, 2015. Failure to demonstrate accuracy may result in possible material misstatement and an adverse verification statement.	<u>Resolved on 5/10 via email. Revised Plan emailed on 5/10 and was found to be complete.</u>
2	5/15/2015	Emissions from propane heaters in Bldg. 54-A not reported.	40 CFR §98.32, and MRR §95115	Non-conformance; correctable error.	Provide invoices from 2013, 2014 and 2015, 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 usage for 2014, 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 CO2e.

3	5/15/2015	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 5/30/2014. Please contact ARB staff if you have questions about which Tier to use to report your emissions data.	<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>
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[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, 2015.

Course 1.2, Handout # 1.2.1 Minimal Allowable Methods (Tiers) under §95115¹

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 ^a [Reference]
MSW		
> 600 tons MSW/day	<ul style="list-style-type: none"> Unit has operated more than 1,000 hours in any calendar year since 2005; 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; The CEMS has been certified according to Part 75, part 60, or an applicable state monitoring program; and Facility has established monitoring infrastructure and meets specific QA/QC requirements according to Part 75, part 60, or an applicable state monitoring program. 	4 [§95115(a)]
	<ul style="list-style-type: none"> Unit does not meet conditions above for Tier 4, and produces steam. 	2 [§95115(a)]
	<ul style="list-style-type: none"> 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"> Unit has operated more than 1,000 hours in any calendar year since 2005; - Unit has existing, certified CO₂ concentration monitor and stack gas volumetric flow rate monitor required by Federal or State regulation or the unit's operating permit; and The CEMS has been certified according to Part 75, part 60, or an applicable state monitoring program; and - Facility has established monitoring infrastructure and meets specific QA/QC requirements according to part 75, part 60, or an applicable state monitoring program. 	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

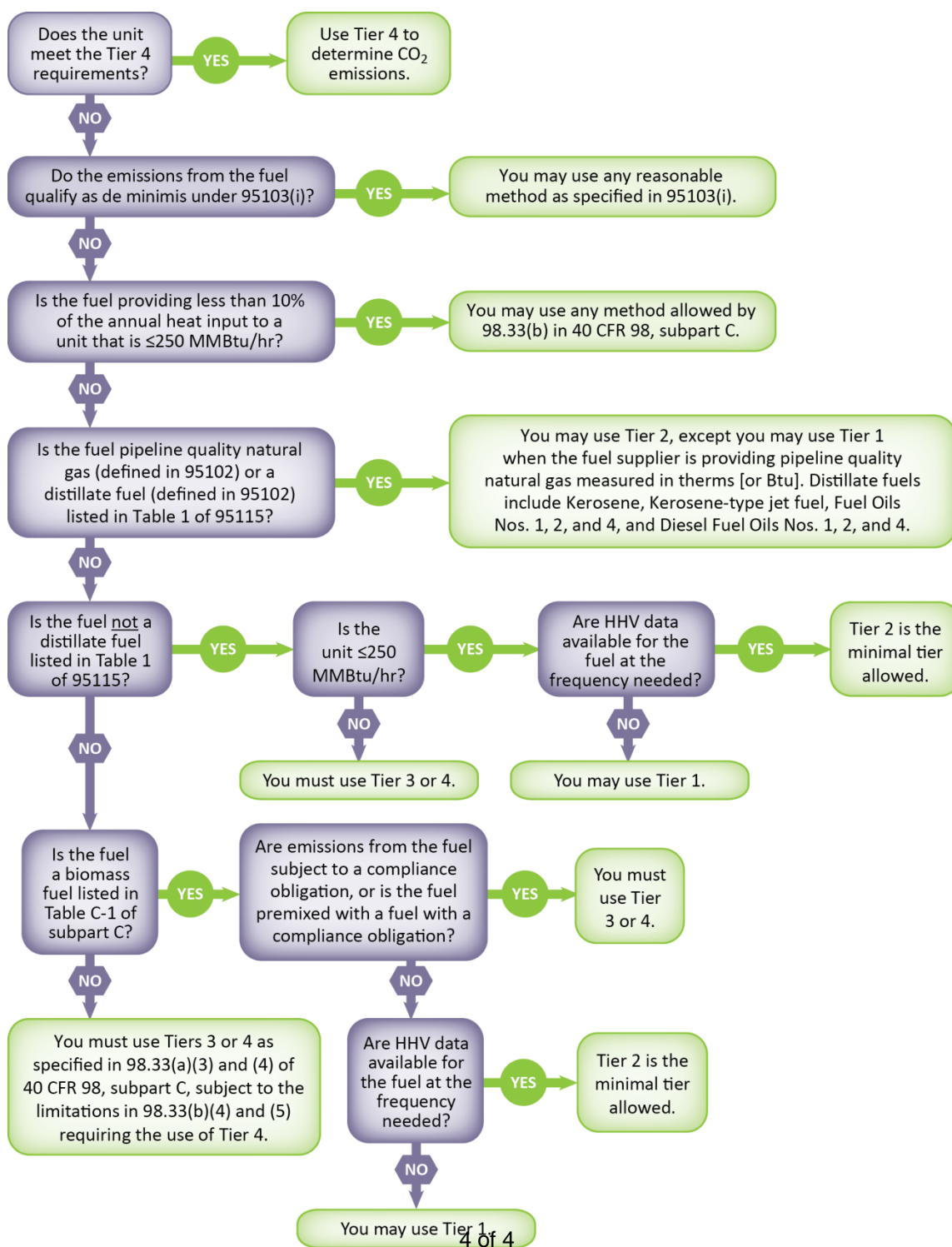
¹ <http://www.arb.ca.gov/cc/reporting/ghg-rep/guidance/tier-tableflowchart.pdf>

Combustion Unit Size	Additional Requirement(s)	Minimum Allowable Tier ^a [Reference]
Solid Biomass Fuels		
Any size	<ul style="list-style-type: none"> Unit that produces steam, and is not required to use Tier 4. 	2 [\$95115(a)]
	<ul style="list-style-type: none"> Unit that does not produce steam, and is not required to use Tier 4, and the fuel is not subject to a compliance obligation, and is not mixed prior to combustion with a fuel subject to a compliance obligation. 	1
Fossil-based Solid Fuels (e.g., Coal)		
> 250 MMBtu.hr	<ul style="list-style-type: none"> Unit has operated more than 1,000 hours in any calendar year since 2005; 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; The CEMS has been certified according to Part 75, part 60, or an applicable state monitoring program; and Facility has established monitoring infrastructure and meets specific QA/QC requirements according to Part 75, part 60, or an applicable state monitoring program. 	4 [\$95115(a)]
	<ul style="list-style-type: none"> The unit does not meet conditions above to use Tier 4; and The unit produces steam. 	3 [\$95115(a)]
≤ 250 mmBtu/hr	<ul style="list-style-type: none"> Unit has operated more than 1,000 hours in any calendar year since 2005; Unit has existing, certified CO₂ concentration monitor and stack gas volumetric flow rate monitor required by Federal or State regulation or the unit's operating permit; and The CEMS has been certified according to Part 75, part 60, or an applicable state monitoring program; and Facility has established monitoring infrastructure and meets specific QA/QC requirements according to Part 75, part 60, or an applicable state monitoring program. 	4 [\$95115(a)]
	<ul style="list-style-type: none"> The unit does not meet conditions above for Tier 4; The unit produces steam. 	3 [\$95115(a)]
Non-distillate Fuels listed in Table 1 of 95115		
> 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"> You routinely perform fuel sampling and analysis for the fuel high heat value (HHV) or routinely receive the results of HHV sampling and analysis from the fuel supplier at the minimum frequency specified in 40 CFR 98.34(a), or at a greater frequency. 	2 [\$95115(c)(1)]

Combustion Unit Size	Additional Requirement(s)	Minimum Allowable Tier ^a [Reference]
	<ul style="list-style-type: none"> You do not meet the conditions above for obtaining HHV data. 	1 [§95115(c)(1)]
Biomass-derived fuels listed in Table C-1 of 40 CFR part 98 subpart C		
Any size	<ul style="list-style-type: none"> Emissions are not subject to a compliance obligation under the cap and trade regulation; and Not mixed prior to combustion with a fuel that has emissions subject to a compliance obligation under the cap and trade regulation. 	1 or 2 [§95115(c)(1)]
Pipeline Quality Natural Gas		
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)]
Distillate Fuels Listed in Table 1 (Kerosene, Kerosene-type jet fuel, Diesel Fuels Nos. 1, 2, and 4, and Fuel Oils Nos. 1, 2, and 4.)		
Any size	The unit does not meet the requirements to use Tier 4	2 [§95115(c)(2)]
Emissions are de minimis under 95103(i) [A portion of GHG emissions representing no more than 3 percent of a facility's total CO ₂ equivalent emissions (including emissions from biomass-derived fuels and feedstocks), not to exceed 20,000 metric tons of CO ₂ 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

Facilities that qualify for abbreviated reporting under §95103(a) may use any method in 40 CFR 98.33(a) to calculate GHG emissions. For 2012 (and later) emissions reported in 2013 (and later), facilities must follow the tier selection shown here. For 2011 emissions data reported in 2012, reporters may use the methods allowed by 40 CFR 98, subpart C (see §95103(h)), and are not required to follow §95115(a) and (c).



Handout 1.3.1 Covered Product Data

C&T § 95891 Table 9-1: Product-Based Emissions Efficiency Benchmarks¹

NAICS Sector Definition	NAICS code	Activity (a)	Benchmark (B _a)	Benchmark Units
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 ≥ 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	0.948	Allowances / Short Ton of Soda Ash Equivalent (Soda Ash, Biocarb, Borax, V-Bor, DECA, PYROBOR, Boric Acid, and Sulfate)
All Other Nonmetallic Mineral Mining	212399	Freshwater Diatomite Filter Aids Manufacturing	0.418	Allowances / Short Ton of Freshwater Diatomite Filter Aids

NAICS Sector Definition	NAICS code	Activity (a)	Benchmark (B _a)	Benchmark Units
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
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

NAICS Sector Definition	NAICS code	Activity (a)	Benchmark (B _a)	Benchmark Units
		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	0.0147	Allowances / Short Ton of Milk, Buttermilk, Skim Milk, and Ultrafiltered Milk
		Cream processing	0.0153	Allowances / Short Ton of Cream
		Butter processing	0.0391	Allowances / Short Ton of Butter
		Condensed Milk Processing	0.0368	Allowances / Short Ton of Condensed Milk
		Nonfat Dry Milk and Skimmed Milk Powder (Low Heat) Processing	0.380	Allowances / Short Ton of Nonfat Dry Milk and Skimmed Milk Powder (Low Heat)
		Nonfat Dry Milk and Skimmed Milk Powder (Medium Heat and High Heat) Processing	0.425	Allowances / Short Ton of Nonfat Dry Milk and Skimmed Milk Powder (Medium Heat and High Heat)
		Buttermilk Powder Processing	0.501	Allowances / Short Ton of Buttermilk Powder
		Dairy Product Solids for Animal Feed Processing	0.0241	Allowances / Short Ton of Dairy Product Solids for Animal Feed
		Intermediate Dairy Ingredients Processing	0.0808	Allowances / Short Ton of Intermediate Dairy Ingredients

NAICS Sector Definition	NAICS code	Activity (a)	Benchmark (B _a)	Benchmark Units
		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
Roasted Nuts and Peanut Butter Manufacturing	311911	Pistachio Processing	0.221	Allowances / Short Ton of Pistachios
		Almond Processing	0.0714	Allowances / Short Ton of Almonds
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
Beet sugar manufacturing	311313	Beet sugar manufacturing	0.611	Allowances / short ton Granulated-Refined Sugar

NAICS Sector Definition	NAICS code	Activity (a)	Benchmark (B _a)	Benchmark Units
Breweries	312120	Lager Beer Manufacturing	0.178	Allowances / Thousand Gallons of Lager Beer
Wineries	312130	Distilled Spirits Production	1.13×10^{-3}	Allowances / Proof Gallons of Distilled Spirits
		Dry Color Concentrate Production	12.0	Allowances / Short ton of Dry Color Concentrate
		Grape Juice Concentrate Production	1.59×10^{-3}	Allowances / Gallons of Grape Juice Concentrate
		Grape Seed Extract Production	9.48	Allowances / Short ton of Grape Seed Extract
		Liquid Color Concentrate Production	6.95×10^{-3}	Allowances / Gallons of Liquid Color Concentrate
Paper (except Newsprint) Mills	322121	Bathroom Tissue Manufacturing	0.108	Allowances / Air Dried Short Ton of Bathroom Tissue produced adjusted by water absorption capacity

NAICS Sector Definition	NAICS code	Activity (a)	Benchmark (B _a)	Benchmark Units
		Facial Tissue Manufacturing	1.32	Allowances / Air Dried Short Ton of Facial Tissue
		Delicate Task Wipers Manufacturing	1.32	Allowances / Air Dried Short Ton of Delicate Task Wipers
		Paper Towel Manufacturing	1.54	Allowances / Air Dried Short Ton of Paper Towel
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
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

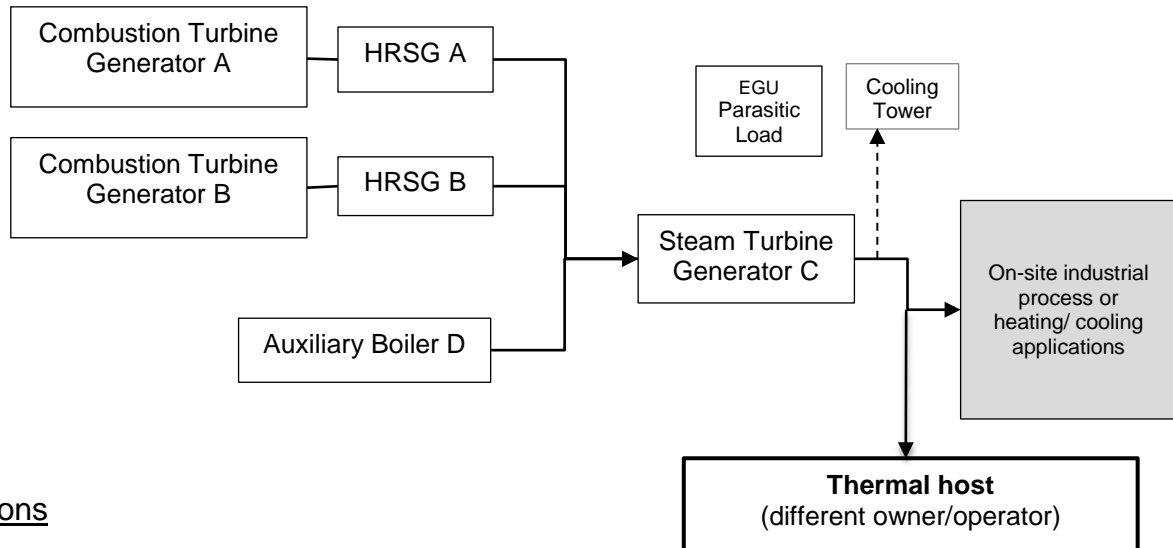
NAICS Sector Definition	NAICS code	Activity (a)	Benchmark (B _a)	Benchmark Units
		Liquid Hydrogen Production	11.9	Allowances / Metric Ton of Liquid Hydrogen Sold
Nitrogenous Fertilizer Manufacturing	325311	Nitric Acid Production	0.349	Allowances / Short ton of nitric acid (HNO ₃ 100%)
		Calcium Ammonium Nitrate Solution Production	0.0902	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
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

NAICS Sector Definition	NAICS code	Activity (a)	Benchmark (B _a)	Benchmark Units
		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	0.403	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
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

NAICS Sector Definition	NAICS code	Activity (a)	Benchmark (B _a)	Benchmark Units
		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

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.

2. Which electricity pathways represent gross generation?

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

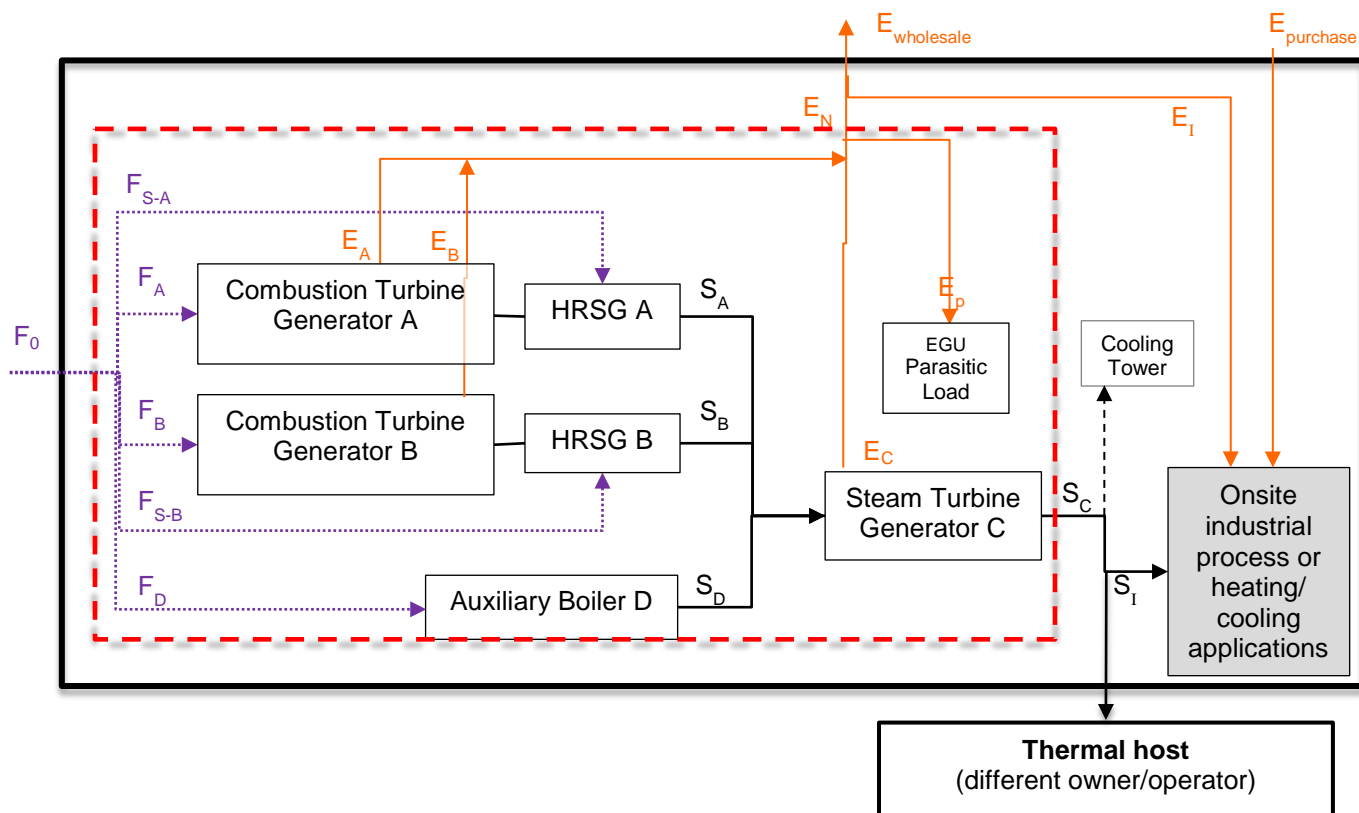
3. Which variables represent total thermal output (not just useful thermal output)?

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. (2013) *Reporting Guidance for Electricity Generating Units*
<http://www.arb.ca.gov/cc/reporting/ghg-rep/guidance/guidance-docs.htm>



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
 $(100 - 10) = 40 + 50$

Facility Name: _____

Facility ARB ID: _____

Facility Reporting Year: 2014

GHG Quantity

CO2 equivalent emissions (excluding biogenic) from subpart C - AA:

CO2 equivalent quantity from supplier categories, including biogenic

Exempt Biogenic CO2 emissions from subpart C - AA: 0 Metric Tons

CO2 equivalent emissions from electric power entities: 0 Metric Tons

Covered CO2 equivalent emissions: _____ Metric Tons

De Minimis CO2 equivalent emissions: 0 Metric Tons

Maximum allowable De Minimis emissions: _____ Metric Tons

General Facility Reporting Information

NAICS Codes

Primary: 221112 (Fossil Fuel Electric Power Generation)

Second Primary:

Additional:

U.S. Parent Companies

Parent Company Name: _____

Address: _____

Percentage of Ownership Interest: 100%

GHG Report Start Date: 2014-01-01

GHG Report End Date: 2014-12-31

Explanation of any calculation methodology changes during the reporting year:

EPA e-GGRT Facility IDs

Full or Abbreviated GHG Report: Full

Company or Entity qualifies for Small Business Status: Yes

Confidential Data and Other Comments:

Electricity Purchases/Acquisitions for Reporting Facilities

Electricity Provider's Name: Pacific Gas and Electric Company (PG&E)

Provider's ARB ID: _____

Purchases/Acquisitions (MWh): _____

Natural Gas Purchases/Acquisitions for Reporting Facilities

Natural Gas Provider Name: Pacific Gas and Electric Company (PG&E) -

Provider's ARB ID: _____

Customer Number: _____

Purchases/Acquisitions (MMBtu): _____

Disposition of Generated Thermal Energy For Other Users

From Non-Cogeneration/Bigeneration Units [95104(d)(4)]

Name Of System Or Units: _____

End-User Name: _____

ARB ID: _____

NAICS: _____

Thermal Energy Provided or Sold (MMBtu): _____

Energy Product Provided: _____

Increases and Decreases in Facility Emissions [95104(f)]:

Have facility emissions increased or decreased more than five percent in relation to the previous data year? Yes

Change in production: Yes

Changes in facility operations in order to comply with:

The cap-and-trade regulation: No

Other air pollution regulations: No

Other regulations, not related to air pollution or greenhouse gases: No

Changes in efficiency due to:

Process or material changes: No

The addition of control equipment: No

Other efficiency measures: No

Other reason(s) for increase or decrease: Yes

Provide a narrative description of how each reason identified in section 95104(f)(2) caused the increase or decrease in emissions. Include in this description any changes in your air permit status: *Facility production decreased in 2014 as compared to 2013 due to*

Note: This section is not subject to the third-party verification

Electricity Generation

Facility has the capacity to generate electricity: Yes

CEC ID (if applicable): _____

EIA ID (if applicable): _____

FERC QFID (if applicable): _____

CAISO ID (if applicable): N/A

Total Facility Nameplate Generating Capacity: _____MW

Facility Type: Independently operated cogeneration facility co-located

Facility's Energy Disposition: Grid-dedicated facility

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 Pacific Gas and Electric Company

Electricity Provided or Sold (MWh) _____

Generated Electricity for Other Users Disposition [95112(a)(4)(B)]

Unit, System Or Group Name _____

End-User Name _____

ARB ID _____

NAICS _____

Electricity Provided or Sold (MWh) _____

Generated electricity used for other on-site industrial processes that are

Reported emissions include emissions from a cogeneration/bigeneration

Disposition of Generated Thermal Energy For Other Users

From Cogeneration/Bigeneration Units [95112(a)(5)(A)]

Parasitic Steam Use: Generated thermal energy used for supporting

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

Portion of Generated Thermal Energy Used to Produce Cooling

Product Produced: ____

Other Product: ____

User Of Product: ____

Description Of Use: ____

Amount Of Thermal Energy (MMBtu): ____

Description of the excluded data and an estimated magnitude of the excluded product(s) using best available methods [95103(l)]:

Subpart C: General Stationary Fuel Combustion

Gas Information Details

Gas Name	Gas Quantity (Metric Tons)
Methane	_____
Nitrous Oxide	_____
Carbon Dioxide	_____
Exempt Biogenic Carbon dioxide	_____

Total Covered CO2e Emissions: ____ (Metric Tons)

Emissions shown above that are claimed as De Minimis (CO2e): 0 Metric Tons

Unit Details

Unit Name: ____

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

Unit Type: ____

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: ____

Type of Thermal Energy Generation: Cogeneration Topping Cycle

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

Additional Comments and Information

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

Total exempt annual biogenic CO2 mass emissions (must equal the sum of calculated annual exempt biogenic CO2) (metric tons): 0

Annual CO2 emissions from sorbent (metric tons): 0

Fuel-Specific Emissions Information

Fuel: Natural Gas (Weighted U.S. Average) - Natural Gas

Calculation Methodology: Tier 1 (Equation C-1a, natural gas billing in therms)

Methodology Start Date: 2014-01-01

Methodology End Date: 2014-12-31

Fuel Emission Details

Total CO2 emissions: _____ Metric Tons

Total CH4 emissions: _____ Metric Tons

Total N2O emissions: _____ Metric Tons

Total CH4 emissions CO2e: _____ Metric Tons

Total N2O emissions CO2e: _____ Metric Tons

Equation Inputs

Annual Natural Gas Usage: _____ therms

Fuel Specific CO2 Emissions Factor: 53.02 kg CO2/MMBtu

Fuel Specific CH4 Emissions Factor: 0.001 kg CH4/MMBtu

Fuel Specific N2O Emissions Factor: 0.0001 kg N2O/MMBtu

Annual Volume of Fuel Combusted: _____ scf

Time And Date Report Generated: 04/08/2015 09:00

Course 1.4: Handout 1.4.3. Comprehensive Case Study/Homework – ARB Training 2015

You are verifying the Moo Cow Dairy, which produces salted and unsalted butter and also produces cheese. Moo Cow operates two natural gas cogeneration units that deliver both steam and electricity to the plant. Natural gas is supplied by PG&E, which provides monthly measured HHV. The two cogeneration units have submeters that separately measure fuel volume and are used to report GHG emissions data to ARB using a Tier 2 calculation. Calibration information is only available for Unit 1. Unsalted butter and cheese were reported as covered products.

Approximately 10 MT CO₂e emissions from natural gas used for comfort heating was not included in the emissions data report. It represents less than 1% of the total emissions.

Complete the following 11 exercises in advance of training session.

Exercise 1: Complete the sampling plan (emissions and *covered* product data only) using the data in Attachment 1 on Page 3.

Moo Cow Sampling Plan

Emission Source	Rank by Magnitude of Emissions			Rank by Risk Uncertainty for Emissions	
	Reported Emissions (MT)	% Contribution to Total Emissions	Rank by Emissions	Rank by Uncertainty	Explanation/Rationale for Uncertainty Ranking
Unit 1	39,737	54	1	<u>Medium</u>	High risk of misstatement using internal submeters to report emissions
Unit 2	34,199	46	2	<u>High</u>	High risk of misstatement using internal submeters to report emissions
Natural gas usage for comfort heating	unknown	unknown	3	<u>Medium</u>	Medium risk. Small emissions source, but source may have been incorrectly omitted from emissions data report.

Covered Product Data	Quantity (short tons)	Rank (quantity)	Rank of Calculation Uncertainty	Explanation/Rationale for Uncertainty Ranking
Butter	40,025	1	High	Lack of experience reporting product data. New reporting requirement. High risk of mis-reporting data.
Cheese	16,381	2	High	Lack of experience reporting product data. New reporting requirement. High risk of mis-reporting data.

Complete qualitative risk narrative

Note: some of the narrative has already been completed by a member of your verification team.

	Description
1. Data acquisition equipment;	Submeter that measures fuel flow may not have been calibrated. High risk of mis-reporting.
2. Data sampling and frequency;	No other fuel sampling requirements. Low risk.
3. Data processing and tracking;	Reasonable accounting system, but low confidence in the staff that are using the system. Medium risk.
4. Emissions calculations;	NG reporting uses simple Tier 2 calculation. Low risk.
5. Product data;	New reporting requirement. Risk of misreporting associated with <i>salted</i> butter not being reported. High risk.
6. Data reporting;	Facility has a complicated energy disposition diagram for their cogeneration facility. Requires a careful conformance check. Medium risk.
7. Management policies or practices in developing emissions data reports.	The new employee reporting data was not trained on how to compile data from the production database; no written policies regarding data integrity and poor communication between accounting and engineering staff. High risk.

EXERCISE 1 - ATTACHMENT 1

2014 Emissions Data Report

Facility Name: Moo Cow

GHG Quantity

CO2 equivalent emissions (excluding biogenic) from subpart C - AA: **73,936** Metric Tons

Covered CO2 equivalent emissions: **73,936** Metric Tons

Dairy product facility [95115(n)(16)]:

Annual quantity of butter (covered product data): **40,025** short tons

Annual quantity of cheese (covered product data): **16,381** short tons

Subpart C: General Stationary Fuel Combustion

Unit Name: Cogen Unit 1

Fuel: Natural Gas

Calculation Methodology: Tier 2 (Equation C-2a)

Fuel Emission Details

Total CO2 emissions: **39,737** Metric Tons

Annual Volume of Fuel Combusted: 735,500,000 scf

Annual Average High Heat Value: 0.001019 MMBtu/scf

Fuel Specific CO2 Emissions Factor: 53.02 kg CO2/MMBtu

Unit Name: Cogen Unit 2

Fuel: Natural Gas

Calculation Methodology: Tier 2 (Equation C-2a)

Fuel Emission Details

Total CO2 emissions: **34,199** Metric Tons

Annual Volume of Fuel Combusted: 633,001,000 scf

Annual Average High Heat Value: 0.001019 MMBtu/scf

Fuel Specific CO2 Emissions Factor: 53.02 kg CO2/MMBtu

Exercise 2: List the data you will need to see before your site visit, what you will observe while visiting the facility, and the staff individuals you want to meet.

Data requested prior to site visit	Rationale/citation
Monthly production quantities for cheese and butter	§95115(n)(16)
Monthly sales data for cheese and butter, and an explanation about on-site inventory storage capacity where product has been produced but not yet sold	Provides confidence that production data is reasonable when compared with sales data
Copy of all 12 monthly natural gas invoices, including Dec. 2013 and Jan. 2015	Supports combustion emissions calculation
Evidence that there is only 1 utility natural gas meter for the facility	Confidence that all natural gas has been accounted for
Calibration data for submeters	Confirm accuracy of meter per §95103(k)
Data/systems to be observed during site visit	Rationale/citation
Meters for cheese and butter	Confirm accuracy of production quantities for covered product data per §95103(k)
Meters for natural gas: observe operation; confirm appropriate placement for accurate measurement; confirm meter model matches calibration and installation information provided	Confirm accuracy of meter per §95103(k)
Data acquisition and handling system for natural gas submeters: ask staff to recreate data reports for one month of last year, and for previous day	Confirm accuracy and completeness of fuel usage report; confirm report matches emissions data report
Accounting system for paying gas bills	Need to connect payment with gas usage for additional evidence of accuracy and to ensure emissions from all gas meters are being reported
Monthly submeter fuel flow data – comparison with revenue meter billing from PG&E	Please compare monthly submeter data with PG&E in a spreadsheet and explain any discrepancies.
Air district permit summary page listing all combustion sources	Confidence that all emissions sources have been reported

Exercise 3: Identify the people you want to meet with during the site visit. Accounting staff in charge of sales receipts and utility payments. Staff that oversees calibration and scale accuracy assessments. Staff that weighs products, purchases (inputs), and tracks product inventory.

Exercise 4: You have completed your data request and sent it to the client. However, despite several requests, the client has not provided you with the requested data. Your site visit is scheduled for a week from today, and you have several other verifications to complete in the near future, and postponing the site visit is difficult. What should you do? Keep careful track of your evidence and issues log, as well as your communications and request for information in case your client is unable to correct errors before the verification deadline and you have to explain the cause of the adverse verification statement. Consider sending an issues log which indicates that lack of evidence or demonstration of accuracy of the reported data will result in an adverse verification statement.

Exercise 5: What is the purpose of the opening meeting? Establish a good working relationship with the reporting entity. Provide an agenda for the site visit. Establish reporting responsibilities of data reporting staff. Identify who is in charge of the data management system.

Exercise 6: How would you verify the natural gas consumption in each of the cogeneration units? Compare calibration frequency used by operator with the frequency specified by the original equipment manufacturer (OEM). Compare total fuel usage from submeters with PG&E data.

Exercise 7: How would you verify the covered product data? How would you confirm that they are covered products?

To verify a covered product, the verifier must evaluate the measurement system that provides the amount of production reported for each product. The measurement system could include truck tickets, purchase and sales records, production logs and scale weights saved to a production database. This includes drilling down to monthly, daily, or hourly production rates to understand how the data are derived and tracked at the facility. After performing direct data checks on production data, verifiers should request records used for reporting to other agencies that could corroborate the accuracy of the data reported to ARB.

To confirm a product is covered, the verifier should compare the operator's written description of each product with each product listed in Table 9-1 of the cap-and-trade regulation, as well as the definitions in §95102(b) for each product. Verifiers must also review handouts from verifier training and other published guidance provided by ARB staff. Verifiers are encouraged to contact ARB staff with questions when it is unclear if a product is covered under the MRR.

Exercise 8: Based on your observations during the site visit, the information provided at the beginning of the case study, and their emissions data report, document issues and concerns in the issues log.

- A. The individual responsible for preparing the emissions data report has been with the parent company for several years, working in accounting in Illinois, but this is that person's first year working at the California plant and first year being responsible for reporting emissions.
- B. While visiting the plant, the plant engineer passes along some information about the production line, suggesting that in August there were several incidences where the scales used to measure cheese output weren't working correctly. When that happened, the company made a best-estimate of the volume of cheese produced during that time.
- C. Although natural gas combustion is reported for the two cogeneration units separately, your visual inspection of the fuel flow meter and company records for Unit 2 indicates that the meter may not have been properly calibrated in 2014.
- D. The GHG Monitoring Plan was written in 2010 and has not been updated. It does not indicate responsible staff, there are no records of meter calibrations or location of submeters, and it refers to an outdated version of the MRR.
- E. Air district permit shows waste oil is allowed to be combusted when natural gas is not available.
- F. Comfort heating is provided by a natural gas heater, which is billed under a different PG&E account than the cogeneration system.

Issues Log for Moo Cow

#	Description of Issue/Source	Regulation Citation	Impact on GHG Data	Action Required by Reporting Entity	Resolution
1	A: Data checks. Staff responsible for reporting GHG data is new to the job.	95131(b)(8)	Clarification needed	Please provide a more detailed description of the source of each data set and how that data was tracked and used in calculations.	
2	B: Quantity of cheese produced included in the emissions data report may have been estimated using "sales" data.	95115(n)	Clarification needed	Please provide written documentation of the data processing steps and describe the process via webinar next week. Section 95131(b)(14)(A) does not allow use of missing data substitution for covered product data.	
3	C: No evidence has been provided regarding measurement accuracy for submeter for Unit 2.	95103(k)(2)	Non-conformance	Provide calibration records for 2013, 2014, and 2015 . *	
4	D: GHG Monitoring Plan does not address training and meter calibration dates.	95105(c)	Non-conformance	Please update the GHG Monitoring Plan and email a copy to me.	
5	E: Air district permit includes ability to combust waste oil if supply of natural gas is interrupted.	95115 and 98.32-33(a)	Non-conformance and material misstatement if waste oil was actually combusted in 2014	Provide evidence whether waste oil was or was not combusted in 2014.	
8	F: Natural gas used for comfort heating was not reported in the emissions data report.	95115 and 98.32-33(a)	Non-conformance	Provide evidence that emissions from all natural gas combustion is reported. See 95115(h) for aggregation of units by unit type categories.	
6	From page #1 of the case study Quantity of <i>butter</i> produced included in the emissions data report does not include salted butter.	95102(b) 95115(n)(16) 95103(l)	Non-conformance	Follow up with ARB staff to confirm which products are required to be reported. Is <i>salted</i> butter included in definition of <i>butter</i> ? Entity may exclude any covered product data except for cement products-must estimate those data and report.	
7	From Attachment 10-4: An explanation or comparison of cheese production vs. sales data has not been provided.	95131(b)(8)(E)	Clarification needed	Please ask accounting to send me the inventory tracking sheet Moo Cow uses for its corporate reporting and loss prevention accounting. Also, please explain how production data compares with sales data (is there a large inventory storage of products?).	

* The challenge as a verifier is how to communicate with independence. You know Moo Cow should have reported emissions using the PG&E meter that is assumed to be accurate, but you may NOT tell them this. The relationship (ratio) between the submeter data can be used to allocate the gas from the revenue meter to each unit. As long as the total emissions are accurate, a "reasonable" allocation between units is acceptable.

Exercise 9: You prepare to close out your site visit. First you **complete your issues log** where applicable while on site, completing as much as possible. What issues would you share with the client at the end of the day?

Let them know you will be asking about measurement accuracy for the submeters (§95103(k)), why the operator chose to report data using submeters, and whether additional natural gas was not reported from comfort heating. Clarify that the GHG Monitoring Plan specified in §95105(c) must be updated and emailed to the VB within 10 days. Remind them you will be asking the head engineer about the scales (§95103(k)) used to measure cheese when he returns from vacation. Provide a date that the issues log will be sent via email to the reporting entity. Clarify that if errors are not corrected and issues are not resolved, an adverse verification statement must be submitted.

Exercise 10: During the site visit, you are given copies of PG&E natural gas invoices. You review the data in the Tier 2 Calculation Sheet from Cal e-GGRT (Attachment 10-1) and compare it to the data from PG&E (Attachment 10-2 and 3). You are also given background documentation on production numbers (Attachment 10-4). What additional issues (if any) would you add to the issues log?

**Attachment 10-1:
Tier 2 Calculation Sheet from Cal e-GGRT (Equation C-2a)**

Month	Unit 1 [Fuel] Volume (scf)	Unit 2 [Fuel] Volume (scf)	Units 1 and 2 [HHV] (MMBtu/ scf)
January	63,803,700	47,842,700	0.001021
February	62,365,000	48,399,000	0.001018
March	63,200,000	51,260,000	0.001019
April	64,050,000	53,060,000	0.001017
May	61,243,150	60,273,150	0.001023
June	62,450,000	60,550,000	0.001016
July	63,321,000	57,341,000	0.001019
August	65,498,000	60,506,000	0.001019
September	64,376,660	53,376,660	0.001013
October	65,587,690	55,587,690	0.001019
November	59,800,000	54,000,000	0.001019
December	39,804,800	30,804,800	0.001023
	735,500,000	633,001,000	0.001019

$$CO_2 = 1 \times 10^{-3} * Fuel * HHV * EF \quad (Eq. C-2a)$$

0.001 MT/kg x scf x MMBtu/scf x 53.02 kg/MMBtu

Unit 1 CO2 = 0.001 x 735,500,000 x 0.001019 x 53.02 = 39,737

Unit 2 CO2 = 0.001 x 633,001,000 x 0.001019 x 53.02 = 34,199

Total CO2 = 39,737 + 34,199 = 73,936 MT CO2

Attachment 10-2:
PG&E Gas Usage (Verified as accurate)

	PG&E Invoice (Therms)
January	1,139,871
February	1,132,307
March	1,172,016
April	1,200,099
May	1,253,318
June	1,267,911
July	1,240,629
August	1,296,523
September	1,206,730
October	1,242,820
November	1,169,951
December	621,746
	13,943,920

$$CO_2 = 1 \times 10^{-3} [0.1 * Gas * EF] \quad (Eq. C-1a)$$

CO2 emissions estimate based on PG&E billing meter in therms =
 MT CO2 = 0.001 MT/kg x 0.1MMBtu/therm x therms x 53.02 kgCO2/MMBtu
 0.001 x 0.1 x 13,943,920 x 53.02 = 73,931 MT CO2

Attachment 10-3
 Cross-check conducted by the verification team
 of the Moo Cow submeter and PG&E data

Moo Cow submeter data (MT CO2)	PG&E data (MT CO2)	Difference
73,936	73,931	-5 (0.007%)

Attachment 10-4
Monthly Butter and Cheese Production and Sales Data (in short tons)

	Butter Production	Butter Sales	Cheese Production	Cheese Sales
January	3,249	3,538	1,366	1,001
February	3,227	3,506	1,476	0
March	3,340	3,495	1,298	0
April	3,420	3,541	1,300	2,089
May	3,572	3,718	1,287	5,421
July	3,536	3,215	1,552	2,237
August	3,695	3,495	1,484	1,876
September	3,439	3,198	1,567	1,023
October	3,542	3,498	1,209	456
November	3,334	2,774	1,378	0
December	2,057	2,832	1,365	0
	40,025	39,999	16,381	16,424

Note to verifier: Carefully review the data in this table.

The sum of each product for all 12 months in the bottom row is accurately summed in the Table. Data for the month of June is missing.

Using sales data to corroborate production data is a reasonable cross-check if the verifier understands how inventory is managed at the facility. Explain to the operator that providing sales data to the verification team provides additional confidence in the reported production data. This is considered good practice for reviewing covered product data.

Exercise 11: You submitted your log of issues to the Moo Cow operator on July 1st. Several issues involve correctable errors. It is now the first week of August and you have not been provided with information on submeters as part of the GHG Monitoring Plan. There have been no other responses to your Issues Log. What do you do?

Even if it is likely that the reporting entity will fix the errors, notify the reporting entity and ARB via email of the potential adverse (emissions data) verification statement at least 10 working days before the verification deadline.

[June data: 3,614; 3,189; 1,099; 2,321]



California Air Resources Board Greenhouse Gas Verification

Verifier Training Examination, Grading, and Disqualification Policy

- **Exam**

- Verifier exam required to maintain accreditation
 - Accreditation as a sector specialist is required for at least one team member for verification of transactions, oil and gas systems, and process emissions pursuant to §95131(a)(2)
 - Picture identification (driver's license) required to be admitted to exam
 - Time allowed for each exam: 90 minutes
 - Minimum passing score: greater than 70% overall
- Allowed materials: Pens and pencils, scratch paper, and a simple calculator (with no text feature). Hard copy of ARB 2013 Mandatory Reporting Regulation (MRR) and EPA 40 CFR Part 98 reporting regulations. Highlighting, underlining, tabs, and annotations in margins are permitted.
- A copy of the training materials (slides and handouts), including notes on the slides, is allowed for all exams.
 - Applicant allowed one exam retake if they fail the first time
 - Upon receiving a second failing score, the applicant is required to retake the relevant course(s) before retaking the respective exam

- **Grading**

- Two ARB staff independently review exam
- Exams within 10% of passing are graded by third ARB staff person
- Any questions in grading are resolved by Verification Section Manager
- ARB will schedule time for reviewing the failed exam(s) on the phone or in person. When you review your exam, you may not take notes, and your total review time will be limited to 15 minutes for the general exam, and an additional 5 minutes for each sector exam. You may not review an exam that you passed. During your opportunity to discuss the exam you did not pass on the phone, ARB staff will give you a general indication of the type of question and then tell you what answer you gave on the exam. We will not give the correct answer to you on the phone or in person.

- **Notification**

- Applicants passing the exam and accredited are added to list of accredited verifiers and sector accreditations on ARB web site
- Verifier accreditation Executive Order mailed at later date
- Applicant failing exam is privately notified of results and retest conditions by e-mail – no mention on webpage, name simply removed until accredited

- **Disqualification from exam**

- Conditions for disqualification
 - Bringing disallowed materials to the exam (as identified by training staff at beginning of training and examination)
 - Sharing information between applicants during or after the exam
 - False identification provided on exam and to the training staff
- Applicants that have completed an exam will be disqualified for sharing information about the exam with other applicants
- If disallowed materials are found either during or after the exam, the applicant is disqualified from the exam.
- If disallowed materials are found after the completion of the exam:
 - Applicant receives written notification from ARB of failure to pass the exam with explanation of disallowed materials being present during the exam

*For additional information regarding ARB's Verifier Training Examination, Grading and Disqualification Policy please contact ghgverify@arb.ca.gov.