

California Environmental Protection Agency
Air Resources Board

California Regulation for the
Mandatory Reporting of Greenhouse Gas Emissions

**2013 GHG Data Reporting
Hydrogen Production and
Petroleum Refineries**

March 20, 2014
Presentation Slides Available Here:
<http://www.arb.ca.gov/cc/reporting/ghg-rep/guidance/guidance-training.htm>

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Outline

- **MRR Updates**
 - What has changed?
 - When do these changes become effective?
- **Hydrogen Production**
 - Additional data reporting requirements
 - Reporting Product Data
- **Petroleum Refineries**
 - Applicability of revisions
 - (CWB discussed in separate training)

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**Updates to the Regulation
for 2013 Data Reporting**

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Regulation Updates

- Revisions went into effect January 1, 2014
- Regulation available here:
<http://www.arb.ca.gov/cc/reporting/ghg-rep/regulation/mrr-regulation.htm>
- Most updates are effective for 2013 data reporting (see section 95103(h))
 - Provisions requiring new data or methods are effective for 2014 data reporting or 2013, using best available methods for data
- See “Applicability of 2013 Revisions” guidance spreadsheet
 - Lists all regulation changes and when they become effective
 - Good reference for identifying areas with revisions

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Applicability of 2013 Revisions

- Excerpt of guidance spreadsheet
- <http://www.arb.ca.gov/cc/reporting/ghg-rep/guidance/guidance-docs.htm>

Guidance for California's Mandatory Greenhouse Gas Emissions Reporting 2/7/2014
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Revisions to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions: Year of Implementation for 2013 Regulatory Amendments

*Note: 2014 = 2013 data reported in 2014, 2015 = 2014 data reported in 2015, and 2014 BAM means Best Available Methods may be used for 2013 data.

| # | Regulation Amendment | Regulation Section | Description of the Regulatory Update | Year Provision is Effective* | Affected Reporting Subpart |
|---|--|-------------------------|--|------------------------------|--|
| 1 | 10k Threshold Clarification | 95101(a)(1)(B) | Clarify CO ₂ , CH ₄ , N ₂ O included for 10k threshold | 2014 | General |
| 2 | Lead Reporting | 95101(a)(1)(B)8., 95124 | Require calculation and reporting of process emissions by lead producers | 2014 BAM | Subpart R - Lead Production |
| 3 | Include Additional Subparts | 95101(a)(1)(G) | Explicitly identify additional subparts for applicability, if they come to California | 2014 | General |
| 4 | Common Control / Ownership | 95101(a)(8) | Specifies requirements for changing responsibility from/to owner to/from operator | 2014 | General |
| 5 | Reporting Threshold and Abbreviated Reporting Limitation | 95101(b)(1)-(2) | Clarify CO ₂ , CH ₄ , N ₂ O included for threshold; disallow abbreviated if total >25k for a 10k facility | 2014 | General |
| 6 | Hydrogen Fuel Cell | 95101(b)(6) | Fuel cell emissions must be included in applicability determination | 2015 | General |
| 7 | Operators of LNG Production Facilities | 95101(c)(10) | Require reporting by operators of LNG facilities that produce LNG from NG from interstate pipelines | 2015 | Subpart NN - Natural Gas, NGL, LPG, CNG, LNG Suppliers |

Requirements and Reporting GHG Data in Cal e-GGRT

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Hydrogen Production Revision Applicability

- 2014 BAM (Best Available Methods for 2013 data reported in 2014)
 - 95114(e)(1) - report C and H content of feedstocks
 - 95114(g) – report CH₄
 - 95114(i) – report and subtract transferred CO₂ and emissions reported elsewhere from your facility totals
 - 95114(j) - report on-purpose and by-product H₂ production
 - 95114(k) – report combustion CH₄ and N₂O emissions
 - 95114(l) – report flaring emissions
- 2014 (full reg requirements for 2013 data reported in 2014)
 - Clarification of source category
 - Report C content & mole wt. for fuels and feedstocks

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Hydrogen Production

- Reporting Carbon and Hydrogen content and average molecular weight for all feedstocks

Equation P-1:
$$CO_2 = \left(\sum_{i=1}^n \frac{44}{12} \cdot F_{dstk_i} \cdot CC_i + \frac{MW}{MWC} \right) \cdot 0.001$$

Facility Name: _____
 Reporter Name: _____
 Unit Name/ID: _____
 Reporting Period: _____
 Comments: _____
 Unit Type: Hydrogen Production Process Unit

Input Data

| Month | [F _{dstk}] = Volume of the gaseous fuel and feedstock used in month n (scf (at standard conditions of 68 °F and atmospheric pressure) of fuel and feedstock) | [CC] = Average carbon content of the gaseous fuel and feedstock, from the results of one or more analyses for month n (kg carbon per kg of fuel and feedstock). | [HC] = Average hydrogen content of the gaseous fuel and feedstock, from the results of one or more analyses for month n (kg hydrogen per kg of fuel and feedstock). | [MW] = Average molecular weight of the gaseous fuel and feedstock from the results of one or more analyses for month n (kg/mole) |
|-----------|--|---|---|--|
| January | | | | |
| February | | | | |
| March | | | | |
| April | | | | |
| May | | | | |
| June | | | | |
| July | | | | |
| August | | | | |
| September | | | | |
| October | | | | |
| November | | | | |
| December | | | | |

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Hydrogen Emissions Avoiding Double Counting

- You must report and subtract transferred CO₂ and emissions reported elsewhere from your facility totals
- You must perform these subtractions to avoid double counting these emissions
- Cal e-GGRT does not do these subtractions

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Hydrogen Production On-Purpose

(covered product data)

- “On-purpose hydrogen” means hydrogen produced as a result of a process dedicated to producing hydrogen (e.g., steam methane reforming). Reporters must NOT include any:
 - Chemicals other than molecular hydrogen (e.g., CH₄ or steam)
 - H₂ later condensed and sold as liquid hydrogen
- Slide updated 5/8/2014 to reflect updated guidance here: <http://www.arb.ca.gov/cc/reporting/ghg-rep/guidance/hydrogen-producers.pdf>

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Hydrogen Production By-Product

- “By-product hydrogen” means hydrogen produced as a result of a process or processes dedicated to producing other products (e.g. catalytic reforming). Reporters must NOT include any:
 - Chemicals other than molecular hydrogen (e.g., CH₄ or steam)
 - H₂ later condensed and sold as liquid hydrogen

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Liquid Hydrogen Sold

(covered product data)

- “Liquid hydrogen sold” means the total amount of molecular hydrogen in liquid form sold to other entities
 - Based on sales records
 - Less any impurities

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Hydrogen Production

- On-purpose and by-product reporting fields added to Cal e-GGRT and are shown below

SUBPART P OTHER INFORMATION
Please complete the required information included below.

Is the hydrogen plant part of an integrated refinery operation? Yes No

Annual mass of on-purpose hydrogen gas produced (covered product data)* (metric tons)

* On-purpose hydrogen means the total amount of molecular hydrogen (H₂) contained in the product stream coming from a process or processes dedicated to producing hydrogen (e.g., steam methane reforming).

Annual mass of molecular hydrogen (H₂) in feedstocks (metric tons)

Annual mass of by-product hydrogen gas produced (metric tons)

Annual mass of liquid hydrogen sold (covered product data) (metric tons)

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Hydrogen Production

- Additional hydrogen data reporting fields

Annual mass of all CO₂ captured, transferred off-site, and reported by the hydrogen production facility as a supplier of CO₂ as described in section 95114(I) (metric tons)

Annual quantity of carbon, other than CO₂, collected and transferred off site in either gas, liquid or solid forms (kg carbon)

Amount of carbon dioxide calculated and reported using other methods in the regulation [95114(g)] (metric tons)

Amount of methane calculated and reported using other methods in the regulation [95114(g)] (metric tons)

Hydrogen Reporting Flaring Emissions

HYDROGEN PRODUCTION UNITS

| Name/ID | CO ₂ (metric tons) | Status ¹ | Delete |
|-----------------------------------|-------------------------------|---------------------|--|
| <input type="checkbox"/> H Unit 2 | | Incomplete | <input type="button" value="OPEN"/> <input type="button" value="✖"/> |
| <input type="checkbox"/> xyz | | Incomplete | <input type="button" value="OPEN"/> <input type="button" value="✖"/> |

HYDROGEN PRODUCTION UNITS (Units monitored by CEMS)

| Name/ID | Status ¹ | Delete |
|--------------------------|---------------------|--------|
| No units have been added | | |

FLARES

| Name/ID | Type | CO ₂ (metric tons) | Status ¹ | Delete |
|------------------------------|-------|-------------------------------|---------------------|--|
| <input type="checkbox"/> Dog | Flare | | Incomplete | <input type="button" value="OPEN"/> <input type="button" value="✖"/> |

¹A status of "Incomplete" means that one or more required data elements are incomplete. For details, refer to the Data Completeness validation messages in your Validation Report by clicking the "View Validation" link above (Note: If there are no validation messages for this subpart you will not see this link).

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Hydrogen Reporting Flaring Emissions

FLARE INFORMATION
Subpart P requires a facility to uniquely identify each flare and provide the information described below for each. Also use this page to enter the method used to calculate carbon dioxide (CO₂) emissions for this flare. For additional information about adding and editing a flare unit, please use the Cal e-GGRT Help link(s) provided. * denotes a required field

UNIT INFORMATION

Name or ID* (40 characters maximum)

Description (optional)

Type Flare

FLARE DETAILS

Type of flare Steam assisted
 Air-assisted
 Unassisted
 Other

Flare service type General facility flare
 Unit flare
 Emergency only flare
 Back-up flare
 Other (specify)

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Hydrogen Reporting Flaring Emissions

Type Flare

FLARE DETAILS

Type of flare

Steam assisted

Air-assisted

Unassisted

Other

Flare service type

General facility flare

Unit flare

Emergency only flare

Back-up flare

Other (specify)

EMISSIONS CALCULATION METHOD

Method used to calculate* the CO₂ emissions. Note that certain methods must be used if certain criteria are met. See the help section for details.

98.253(b)(1)(ii)(A) - Equation Y-1a Gas Composition Monitored

98.253(b)(1)(ii)(A) - Equation Y-1b Gas Composition Monitored

98.253(b)(1)(ii)(B) - Equation Y-2 Heat Content Monitored

ARB 95113(d) - Start-up, Shutdown, Malfunction Equation

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Hydrogen Reporting Flaring Emissions

START-UP, SHUTDOWN, OR MALFUNCTION (SSM) SPREADSHEET UPLOAD

Use the SSM equation Calculation Spreadsheet to calculate the result. Upload the completed XML exported from the spreadsheet.

▶ Use the SSM Equation spreadsheet to calculate

No file selected.

| Uploaded File Name | Attached By | Date | Delete |
|--------------------|-------------|------|--------|
| No files found. | | | |

EQUATION Y-4 & Y-5 SPREADSHEET UPLOAD

Use the equation Y-4 & Y-5 Calculation Spreadsheet to calculate the result. Upload the completed XML exported from the spreadsheet.

▶ Equation Y-4 & Y-5 Calculation Spreadsheet

No file selected.

| Uploaded File Name | Attached By | Date | Delete |
|--------------------|-------------|------|--------|
| No files found. | | | |

START-UP, SHUTDOWN, OR MALFUNCTION (SSM) EQUATION SUMMARY AND RESULT

$$CO_2 = 0.98 \times 0.001 \times \left(\sum_{p=1}^n \left[\frac{44}{12} \times (Flare_{SSM})_p \times \frac{(MW)_p}{MVC} \times (CC)_p \right] \right)$$

Hover over an element in the equation above to reveal a definition of that element.

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- ## Reporting CH₄ and N₂O stationary combustion emissions (95114(k))
- CEMS
 - Report these emissions in Subpart P
 - No CEMS
 - Report CH₄ and N₂O emissions in Subpart C
 - Create a new configuration in Subpart C
 - Name the configuration (e.g. H plant N₂O/CH₄)
 - Add fuel(s) to configuration
 - Select “enter my own” for CO₂, and enter zero
 - Let tool compute or enter your own values for CH₄ and N₂O
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- ## Petroleum Refineries Revision Applicability
- 2014 BAM (Best Available Methods for 2013 data reported in 2014)
 - no longer report CWT
 - for CWB must report annual volume unit throughput
 - 2014 (full reg requirements apply for 2013 data reported in 2014)
 - 95113 – refineries are separate entities for reporting purposes
 - 95113(l)(1) - timing requirements for assessment of primary refinery products for materiality
 - 95113(l)(2) – provide Solomon EII documentation to verifier
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Questions?

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Additional Training Sessions

- ARB sector-specific training (check link for times)
<http://www.arb.ca.gov/cc/reporting/ghg-rep/guidance/guidance-training.htm>
- Contact ARB staff as needed for questions

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Resource Web Sites

- Email reporting questions to: ghgreport@arb.ca.gov
- Reporting Guidance: Applicability, Metering
<http://www.arb.ca.gov/cc/reporting/ghg-rep/guidance/guidance.htm>
- Cal e-GGRT Tool Training: Registration, Subparts
<http://www.arb.ca.gov/cc/reporting/ghg-rep/tool/ghg-tool.htm>
- Cal e-GGRT Main Help Page
<http://www.ccdsupport.com/confluence/display/calhelp/Home>

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Key Reporting Dates

| Date | Activity |
|-------------|--|
| February 1 | Regulatory deadline: Due date for electric power entities to register specified facilities outside California |
| February 13 | Public release of Cal e-GGRT |
| April 10 | Regulatory deadline: Reporting deadline for facilities and suppliers of fuels and carbon dioxide, except when subject to abbreviated reporting |
| June 2 | Regulatory deadline: Reporting deadline for electric power entities and those subject to abbreviated reporting |
| July 15 | Regulatory deadline: Deadline for corrections to RPS Adjustment data required for electric power entity data reports |
| September 2 | Regulatory deadline: Final verification statements due (emissions data and product data) |

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| GHG Reporting Contacts | |
|--|---|
| Subject Matter | Contact |
| GHG Mandatory Reporting (General) | <u>Brienne Aguila</u> , Manager 916.324.0919 |
| Reporting Requirements, Stationary Combustion, Other Sectors (cement, glass, pulp and paper, etc.) | <u>Patrick Gaffney</u> 916.322.7303 |
| Reporting Tool Registration and General Questions | <u>Karen Lutter</u> 916.322.8620 |
| Electricity Generation and Cogeneration Facilities | <u>Patrick Gaffney</u> 916.322.7303 |
| Electricity Retail Providers and Electricity Marketers | <u>Wade McCartney</u> 916.327.0822 |
| Fuel and CO ₂ Suppliers - Transportation Fuels, Natural Gas, LPG, CO ₂ | <u>Syd Partridge</u> 916.445.4292 |
| Petroleum Refineries, Hydrogen Plants, Oil & Gas Production | <u>Byard Mosher</u> 916.323.1185 |
| Product Data – Refineries, and Oil & Gas | <u>Byard Mosher</u> 916.323.1185 |
| Greenhouse Gas Report Verification | <u>Renee Lawver</u> , Manager 916.322.7062 |
| Chief – Climate Change Program Evaluation Branch | <u>Rajinder Sahota</u> , Chief 916.323-8503 |

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END

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