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Verifier's Perspectives - Lessons Learned from California Mandatory Greenhouse Gas Emissions Reporting Program

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Presenters / Authors

Charles C. Lee, Ph.D.

Managing Consultant, California Consulting Operations & GHG Verification
clee@trinityconsultants.com

Vineet Masuraha

Office Manager, California Consulting Operations & GHG Verification
vmasuraha@trinityconsultants.com

Trinity Consultants

1 Technology Drive E
Suite F -215
Irvine, CA 92618
949-296-4100 (phone)

www.trinityconsultants.com/ab32ghgverification/



Agenda

- Introduction
- Verifier's Perspectives regarding various facets of ARB GHG mandatory reporting and verification program
- Challenges and Issues encountered during 2010 GHG verification activities
 - ◆ Regulations and Technical Guidance
 - ◆ Corporate or Facility Protocol Documents
 - ◆ Third-Party Independent Verification Program
- Verification Preparation Tips
- Summary & Concluding Remarks
- Questions and Answers (Q&A)

Evolution of Trinity Consultants



1974

- ◆ One person
- ◆ One office
- ◆ Air quality specialty

2011

- ◆ 280 employees
- ◆ 29 offices nationwide
- ◆ International: China & Middle East
- ◆ Regulatory compliance and strategic environmental management assistance

Trinity Consultants Offices Worldwide





Partnering with Trinity Consultants

- Our AB 32 GHG Verification Services Group consists of environmental professionals with engineering backgrounds, most with advanced degrees and professional certifications.
- Our multi-disciplined staff provides the highest quality verification services that enhance regulatory compliance while maximizing operational flexibility.
- Trinity helps its clients accomplish this by combining regulatory expertise, technical proficiency, and responsiveness.
- Trinity's ISO 9001 certified Quality Management System ensures that clients consistently receive high quality verification services.



Partnering with Trinity Consultants

- Trinity's AB 32 GHG Verification team provides the following unique benefits to our clients:
 - ◆ Firm recognition as a leader in air quality and climate change issues.
 - ◆ Keen understanding of AB 32 regulatory and reporting requirements.
 - ◆ Availability of experienced ARB accredited verifiers (general and all sector specific verifiers) and staff to provide verification opinions quickly and cost effectively
 - ◆ Experience in developing verification and sampling plans, reviewing GHG inventory requirements, conducting site visits, reviewing data and methodologies, and reviewing GHG emission calculations, resulting in effective completion of AB 32 verification services and opinions.
 - ◆ An in-depth understanding of the industry sectors affected by the AB-32 verification requirements — our auditors speak the language of your industry sector and understand the unique challenges of your sector.
 - ◆ Extensive experience with performing compliance and system audits for clients in a professional, beneficial, and efficient manner.

Trinity's Accredited AB32 GHG Lead Verifiers

	ARB Accredited	Lead Verifier	GSC	Electricity Transactions	Refinery	Cement	Industrial / Inventory / Other Experience
Rhonda Grigg	X	X	X	X	X	X	> 26 years
Vineet Masuraha	X	X	X		X	X	> 13 years
Dr. Charles Lee	X	X	X	X	X	X	> 11 years




Trinity's 2010 GHG Verification Services and Activities

Applicable Reg.	Primary Industry Sectors	Percent Overall (%)
§95111	Electricity Generation Facilities	71
§95111	Retail Providers and Marketers	10
§95112	Cogeneration Facilities	5
§95114	Hydrogen Plants	2
§95115	General Combustion Facilities*	12

* Three of five general combustion facilities were also categorized as cogeneration facility under secondary industry sectors.

It is worthy to note that this presentation is limited to the verification activity and experiences related to the Mandatory Reporting of Greenhouse Gas Emissions Regulation (the GHG Regulation) by ARB.



Verifier's Perspectives: Challenges and Issues encountered during 2010 GHG verification activities





Regulation and Guidance Documents

- In 2010, in effort to provide more detailed guidance to reporting and verification entities, ARB has published various guidance documents¹⁻⁵ in addition to the GHG regulation text⁶:
 1. *Mandatory Reporting of Greenhouse Gas Emissions: Instructional Guidance for Operators*; California Air Resources Board (December 2008).
 2. *Step-by-Step Guidance: GHG Emissions Reporting Using the California ARB On-Line Reporting Tool*; California Air Resources Board (March 25, 2009).
 3. *Verification of Greenhouse Gas Emissions Data Reports: Technical Guidance for Verifiers*; California Air Resource Board (July 2010).
 4. *California GHG Emissions Reporting Tool: Supplemental Users Guide for ARB Accredited Verifiers*; California Air Resources Board (March 2010)
 5. *Frequently Asked Questions Regarding the Verification of GHG Emissions Data Reports*; California Air Resources Board (March 2010).
 6. *Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (Title 17, California Code of Regulations, §95100-95133)*; California Air Resources Board, 2009.



Regulation and Guidance Documents

- Having various detail guidance on different elements of the GHG program was challenging for verifiers AND reporters to comprehend.
- The regulation text appeared ambiguous and various technical guidance documents do not exhibit consistency on certain specific topics (e.g., “net power generated”).
- The interpretation of regulation text and/or requirements by ARB has changed over the verification period (April 2010 through December 2010) in 2010 on certain specific topics (e.g., fuel type-natural gas and associated GHG calculation methodologies).
- Such deficiency in establishing consistency in the technical guidance and interpretations by agency has caused confusion among the reporters and verifiers and has ended up taking additional time and effort to resolve related matters and reach a consensus.



Facility Protocol Documents

- GHG inventory protocol document is to provide guidance to GHG data organizer and coordinators, such that the development and management of the GHG inventory across all applicable assets is credible and verifiable.
- Although not required under ARB's regulation, a GHG protocol document is the foundation upon which a corporate entity or facility can develop a reliable and credible GHG inventory.
- In 2010, only about 30% of the reporting facilities that Trinity verified had corporate or facility GHG protocol documents, which incorporated both California and federal GHG regulation elements.
- Benefit:
 - ◆ Helpful for verifiers to understand the GHG inventory, organization structure, estimation methodology, data handling and management system in an efficient manner
 - ◆ Less cost in completing the required verification service
 - ◆ Reduce risk of regulatory violation and future enforcement action by agency



Independent 3rd-Party Verification Program

- The primary objective of GHG inventory verification is to provide an independent view over the accuracy and reliability of reported GHG data.
- The overall verification program implemented to achieve such goal under the ARB regulation consists of the following elements:
 - ◆ Pre-verification Activities:
 - Selection of verification body and contracting verification service by reporting entity
 - Self evaluation for conflict of interest and notification of verification services (COI/NOVS) by verification body
 - COI/NOVS evaluation approval process by ARB
 - ◆ Core Verification Activities:
 - Planning-initial review of systems and process
 - Development of verification plan and sampling plan
 - Planning and conduct of Site-visit
 - Detailed data checks and evaluation
 - Development and submittal of detailed verification report to reporting entity
 - Issuance of verification opinion to ARB



Independent 3rd-Party Verification Program

- In general, the effort and amount of time needed to complete the pre-verification activities varied from project to project, depending on the complexity of contracting requirements insisted upon by the reporting entity and/or verification body.
- Contracting :
 - ◆ Trinity's 2010 experiences ranged from one week to two months, accounting for the time consumed from issuance of request for proposal (RFP) to receipt of proposal approval and/or purchase order (PO).
- COI Self Evaluation:
 - ◆ Took considerable time for those with prior business relationship corporate-wide since ARB requires a thorough evaluation of any prior business/project experiences covering all the way up to parent companies and development of mitigation plan (if applicable)
 - ◆ Trinity's typical experience ranged from a half day to three days for COI self-evaluation.



Independent 3rd-Party Verification Program

- The subsequent COI/NOVS approval process by ARB allowed under the GHG regulation is 45 days.
 - ◆ ARB took around 14 days on average, ranging from three days to 26 days, depending ARB staff's availability, and COI risk and complexity level.
- The overall process of pre-verification steps may take up to approximately three months before verifiers can start the actual data checks and verification activities.
- **Therefore, it is essential for reporters to initiate the selection and contracting of verification body well in advance of the respective verification deadlines.**



Independent 3rd-Party Verification Program

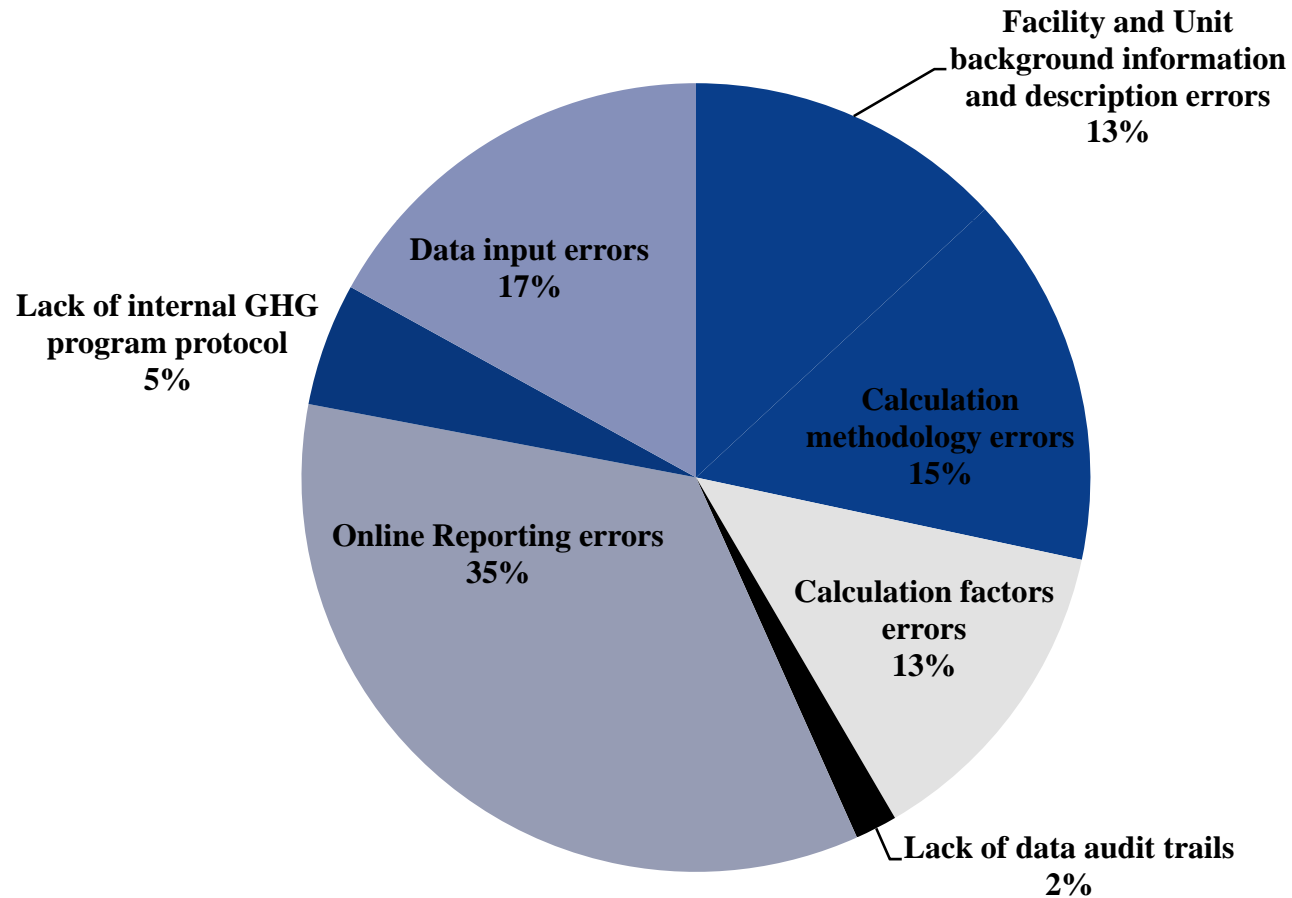
- The deficiencies and deviations identified during the initial facility site-visits and detailed data checks across the all industry sectors in 2010 is summarized by types of error as follows:

Type and Category of Deficiency*	Percent (Out of Total Number of Findings) (%)
Facility and Unit background information and description errors	10 - 20
Calculation methodology errors	15 - 25
Calculation factors errors	10 - 20
Lack of data audit trails	1 - 3
Online Reporting errors	35 - 45
Lack of internal GHG program protocol	5 - 7
Data input errors	15 - 25

* For this presentation purpose, term of deficiency is generally used to represent any deviations from ARB's regulation and technical guidance, including but not limited to, errors causing materiality mis-statement and non-conformance.

Independent 3rd-Party Verification Program

Type and Category of Deficiency*





Independent 3rd-Party Verification Program

- During the initial facility site-visits and first round of detailed data checks, the reporting entities with substantial deviations (i.e., misstatements and non-conformance issues) in the reporter's data were estimated to be in the order of **95-98%** of the total number of verified reporting entities.
- After additional round(s) of correction, re-certification, and re-verification, as necessary, the reporting entities with substantial deviations (i.e., final adverse opinion) reduced to about **5%** of total verified entities at the end of verification process.
- **This result clearly shows the benefit of third-party verification process as a part of ARB's mandatory GHG reporting program.**



Independent 3rd-Party Verification Program

- The amount of verification effort expressed in percent of reporting entities requiring additional rounds of the verification process is summarized as follows:

Number of Round(s) Needed to Complete Verification Process*	Percent of Total Verified Entities (%)
Facility completed after 1 st round of verification	0
Facility completed after 2 nd round of verification	55 - 65
Facility completed in 3 rd round of verification	25 - 35
Facility completed in 4 th round of verification	5 - 15
Facility received final “positive opinion”	95
Facility received final “adverse or negative opinion”	5

* For this presentation purpose, each round of verification process is generally used to represent each cycle of verification process consistent with ARB’s regulation and technical guidance requirements, including but not limited to, data collection, data checks, and identification of errors.



Independent 3rd-Party Verification Program

- In general, examples of the substantial issues identified and lessons learned in the first year of verification activities included:
 - ◆ Internal GHG inventory protocol or monitoring plan were missing or not sufficiently detailed to enable consistent reporting across facility (i.e., various departments)
 - ◆ Lack of internal quality assurance procedures for GHG program
 - ◆ Inadequate or insufficient understanding of GHG regulation and technical guidance by regulatory agency
 - ◆ Weakness in management systems and controls over GHG data
 - ◆ Difficulty and complexity with data entry using the online reporting tool, causing errors
 - ◆ Improper calculation methodology (e.g., use of default factors), inconsistent with specified methodology by the ARB regulation
 - ◆ Insufficient documentation to support and demonstrate data quality and accuracy
 - ◆ Lack of data available from and site access to facilities operated by others (e.g. utility company)
 - ◆ Lack of record keeping or training records demonstrating expertise or competency for those directly involved in GHG inventory and/or reporting
 - ◆ Deficiency in documentation organization, central filing system, and data access

Verification Preparation Tips





Preparation Tips for Efficient Verification Process

- Keep the data organized, documented, and archived in a central location
 - ◆ Documented GHG Inventory Program with information on data collection, estimation methods, responsible personnel, and etc.
 - ◆ Documented internal QA/QC Process with information on internal check methods, responsible reviewer, findings, corrections, and etc.
- Provide as much relevant information as possible prior to Site-Visit as requested
 - ◆ If possible, provide all relevant data and documents electronically (and/or in hard copies) in the beginning stage of verification process (i.e. in pre-verification questionnaire and data collection step)



Preparation Tips for Efficient Verification Process

- Make all relevant documentation accessible to Verifiers as requested during the site-visit.
- The data identified in the sampling plan need to be available for Verifiers on site:
 - ◆ Data Management System data and information
 - ◆ Emission Inventory spreadsheet
 - ◆ Process Diagram of all emission sources and fuel meters
 - ◆ Instrument maintenance and calibration records (fuel meters)
 - ◆ Training documentations and Internal QA/QC Procedures
 - ◆ Change log describing any and all changes to GHG accounting methods
 - ◆ Other relevant and applicable information needs to be accessible to Verifiers



Preparation Tips for Efficient Verification Process

- Prepare and show the documents that address the following key issues:
 - ◆ Operational Control and Geological Boundaries
 - ◆ Data Management System
 - Data acquisition & handling flow
 - Parameters tracked
 - ◆ List of Source Inventories – identified by process and non-process
 - ◆ Level of reporting
 - Emissions at individual unit level (aggregated vs individual)
 - Devices and indirect energy usage at facility wide level
 - ◆ Fuel purchase records – by Fuel Type
 - ◆ Fuel use measurements and methodologies
 - ◆ Heating Value & Carbon Content Measurements
 - ◆ Sampling locations, frequency & representativeness
 - ◆ Onsite lab procedures & records if applicable
 - ◆ Fuel Calculation vs CEMS requirements
 - Units and Conversion Factors



Preparation Tips for Efficient Verification Process

- Coordinate and make sure that appropriate staff who have worked on GHG inventories, reporting, and/or internal QA will be available for Verifiers for interview while conducting site visits
 - ◆ Operators are required to make available to the verifiers all information/documentation as well as personnel who has an access to or has worked to develop the emissions data report
 - ◆ Interview with key staff is also critically helpful to properly verify conformance with the regulatory requirements
 - ◆ Interviewee candidates should be prepared to answer and explain the GHG work that they have performed in an organized manner

Conclusion and Summary



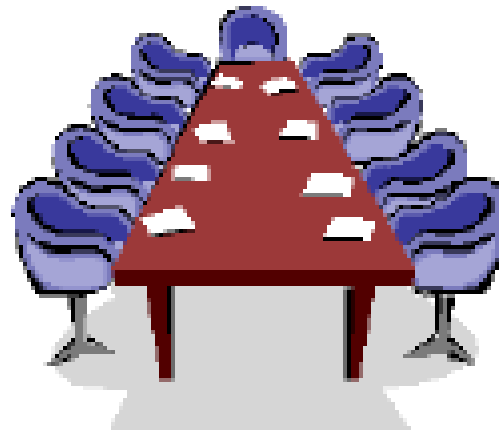


Conclusion and Summary

- The need for more consistent interpretation and clear guidance by ARB is needed to minimize the challenges and confusions encountered by reporting entities and verification bodies.
- It was discovered that all reporters had varying degrees of deficiencies and deviations in their record keeping, documentation, and emissions estimations, causing either or both materiality and conformance issues in their original GHG reports in 2010.
- It is essential for reporting industries to implement a credible and demonstrable GHG inventory program with an updated written GHG inventory protocol or monitoring plan, supported by auditable trails of documentations.
- The overall pre-verification process may take up to three-months before the actual verification activity can take place based on 2010 verification experience.
- Thus, an early initiation of verification body selection and contracting procedure is highly recommended for a best business practice.



Questions?





Thank you for attending