



CSA PCP-03

Greenhouse Gas Inventory Quantifier Personnel Certification Guide

OCTOBER 2012

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Purpose of this Handbook

This handbook provides information on the requirements to achieve and renew a Greenhouse Gas Inventory Quantifier (GHG-IQ) personnel certification.

This personnel certification guide is provided for informational purposes only. The most current version of this manual, as published on the CSA Group website, shall prevail in any case a discrepancy occurs between this version and the official released version of this guide.

About CSA Group

CSA Group (an operating name of the Canadian Standards Association (CSA) and its wholly owned subsidiary CSA America, Inc.) is a not-for-profit, membership-based, solutions-oriented organization, serving business, industry, government and consumers in North America and the global marketplace. Our corporate vision is a better, safer, more sustainable world where standards work for people and business. CSA Group achieves this goal by focusing on the development and delivery of standards and codes, application products, training, advisory services and personnel certification programs - all aimed at enhancing public safety, improving quality of life, preserving the environment and facilitating trade.

CSA Group is an independent, not-for-profit membership association serving business, industry, government and consumers. CSA Group provides standards development, application products, training and advisory services; testing and certification services for electrical, mechanical, plumbing, gas and a variety of other products; and consumer product evaluation, inspection and advisory services for retailers and manufacturers.

As technologies continue to grow and evolve, and as the labor force grows more mobile, so has the need for a method to consistently assess, certify and measure individual worker knowledge. In response to this growing need, CSA America, Inc. develops and manages personnel certification programs to the requirements of ANSI/ISO/IEC 17024:2003 *General Requirements for bodies Operating Certification Systems of Persons*. Current operating programs include CNG (Compressed Natural Gas) Fuel System Inspector, Gas Laboratory Technicians, Greenhouse Gas Inventory Quantifier, Greenhouse Gas Verifier, Construction Electrician (NOC 7241) Solar Photovoltaic (PV) Installer and Certified Medical Device Reprocessing Technicians.

CSA America, Inc., a wholly owned subsidiary of CSA Group, is an ANSI Accredited Certifier – Accreditation # 0779 for the CNG Fuel System Inspector personnel certification program.

Certification Contact Information

US

CSA Group
Personnel Certification Coordinator
8501 East Pleasant Valley Road
Cleveland, OH 44131
Phone: (800) 463-6727
Fax: (877) 539-7613
Email: training@csagroup.org
www.csagroup.org

CANADA

CSA Group
Personnel Certification Coordinator
5060 Spectrum Way, Suite 100
Mississauga, Ontario
Canada, L4W 5N6
Phone: (800) 463-6727
Fax: (877) 539-7613
Email: training@csagroup.org

Greenhouse Gas Inventory Quantifier (GHG-IQ) Personnel Certification

About this Certification

The Greenhouse Gas Inventory Quantifier (GHG-IQ) Personnel Certification has been developed by CSA Group and the Canadian Standards Association in conjunction with industry stakeholders to provide assurance that an individual possesses the competencies deemed necessary to perform the job function of a GHG Inventory Quantifier.

This certification has been developed in compliance with the ISO 17024 standard. ISO 17024 is the global benchmark for organizations operating personnel certification programs and outlines the methods and procedures required to ensure the objective and unbiased assessment of a candidate's knowledge, skills and abilities.

Passing the GHG-IQ examination will indicate that the candidate possesses the knowledge, skills and judgment to work in the role of a quantifier in inventory environments.

Certified Greenhouse Gas Inventory Quantifiers will be periodically re-assessed to ensure they remain up-to-date on technical developments and industry changes.

Personnel Certification programs are administered through CSA Group. The CSA Group website will contain a registry of certified Greenhouse Gas Inventory Quantifiers.

Qualifications of a Certified Greenhouse Gas Inventory Quantifier

The Greenhouse Gas Inventory Quantifier certification tests each candidate's knowledge to ensure the candidate possesses the knowledge and skills of the GHG-IQ known as the qualified candidate. CSA's expert committee defines the qualified candidate as follows:

The qualified candidate is able to design and plan a basic inventory process; evaluate and apply quantification methods for the purpose of compiling a Greenhouse Gas inventory; articulate protocol – specifications or recommendations for the management of GHG information; evaluate various sources of information to help identify the organizational, geographic, temporal and operational GHG inventory boundaries of the business; determine an appropriate method to calculate emissions by evaluating the information; identify the requirements of appropriate protocol(s) as selected by the organization; use basic math skills and knowledge of statistics (e.g., error checking and sampling procedures) to perform emissions calculations and quality assurance and quality control checks. Furthermore, the qualified candidate has general knowledge of GHG accounting and reporting fundamentals, climate change science principles, and generally accepted protocols, standards and methodologies (e.g., GHGP, ISO, IPCC).

The qualified candidate can perform greenhouse gas inventory quantification activities including:

1. Understand the principles of direct and indirect emissions sources.
2. Create spreadsheets or use similar organizational-specific tools to create a GHG inventory.
3. Effectively communicate (both verbally and in writing) information requirements and outcomes to organizational staff.
4. Use analytical methods to check data quality for the purposes of producing a verifiable GHG assertion.
5. Synthesize data and populate spreadsheets or other tools for the purpose of managing the data.
6. Prepare GHG inventory reports of various types for review.
7. Identify emission sources and sinks by conducting site visits or analyzing process flow diagrams.
8. Know what items to ask for and know to document missing items
9. Design and plan a basic GHG inventory
10. Differentiate between stationary combustion process and fugitive emissions
11. Define organizational boundaries, based on operational control or equity share methodologies.

Greenhouse Gas Inventory Quantifier (GHG-IQ) Personnel Certification

Certification Prerequisites

There are no prerequisites that must be satisfied to apply to take the GHG-IQ exam for certification. It is recommended that a candidate have one year experience in inventory quantification.

Training Resources

Greenhouse gas inventory quantification and protocol courses are available through a number of organizations throughout the U.S., Canada and internationally. Courses are also available through professional associations and may be available through private colleges or other training providers. CSA Group does not endorse any organization.

Certification Process

Application Process

To become a Certified Greenhouse Gas Inventory Quantifier an applicant must:

1. Submit a signed application form including all required information
2. Sign and adhere to the professional code of ethics
3. Submit all required fees
4. Pass a written exam

All fees are due when submitting the application.

An e-mail address must be included as this will be the primary mode of communication regarding the steps in the certification process.

CSA Group will process applications in the order received. If an application is incomplete, CSA Group will notify the applicant via e-mail of the deficiencies found in the application. Those deficiencies must be corrected before the candidate will be approved to take the certification exam.

All applicants will receive a confirmation e-mail regarding their registration and certification eligibility requirements.

Each new application has a life span of six (6) months from the time it is received. The applicant must fulfill all requirements of the certification process within that time period. If an applicant is unable to complete the certification process within that period of time, the application will expire and the applicant must restart the certification process including payment of any application or examination fees.

The certification application is provided at the end of this document.

Program Fees

	US/CAD
Initial Application Fee (non-refundable)	\$ 95.00
Examination and Certification Fee	\$ 500.00
Re-examination Fee	\$ 95.00
Annual Fee	\$ 50.00
Replacement Certificate Fee	\$ 10.00
Exam Rescheduling Fee	\$ 75.00

Payment and Refund Policy

Payment of the fees must be submitted with the completed and signed application. All fees shall be submitted in US or Canadian funds. CSA Group accepts checks, Visa, MasterCard and American Express as payment.

When the payment has been received, and the application is processed, notification will be sent regarding the next steps:

- Request for additional information
- Application audit (if selected)
- Exam scheduling notification.

Application fees are non-refundable.

Exam fees may be partially refunded if a written request is submitted at least one month prior to a scheduled exam date and at least one month prior to the examination eligibility expiration date. CSA Group will retain the application fee **and** a processing fee of \$95 US or CAD Funds as applicable.

Certification Process

Audit Process

The submission of an application indicates the applicant's agreement to comply with the terms of CSA Groups' audit process. All applications are subject to an audit and a percentage of applications are randomly selected for audit. Please note that while the selection process for an audit is primarily random, CSA Group reserves the right to select any applicant to be audited at any time, including after the credential has been awarded.

The applicant will be notified when the application and fee is received if the submitted application is selected for audit. An audit notification will be sent to the applicant electronically and will provide detailed information on how to comply with the terms of the audit. During an audit, the applicant will be asked to submit supporting documentation required by the certification requested that may include, but is not limited to, the following:

- Copies of diploma or a global equivalent;
- Signatures from supervisor(s) or manager(s) for the skills, experience and/or responsibilities if required and documented in the experience section of the application and on the performance checklist;
- Copies of certificates and/or letters from the training institution(s) for any mandatory course if documented on the application;
- Copies of certificates and/or letters to demonstrate the required amount of professional development; and
- Other items required by the credential applied for.

Once documentation is provided, the audit should take approximately two weeks to complete. The applicant may not continue with the certification process until the applicant has complied with the audit requirements.

Once the applicant has successfully completed the audit, the applicant will be permitted to continue the certification process and will be notified of his/her examination eligibility. If the applicant fails to meet the audit requirements, a refund may be given, dependent upon the stage of the certification process at the time of the audit. If the applicant fails to meet the audit requirements after attaining the credential, the applicant is not entitled to a refund. (Refer to the Payment and Refund Policy section of this handbook for more details).

Examination Administration and Scheduling

The Greenhouse Gas Inventory Quantifier certification is administered through CSA Groups' test vendor, Kryterion, Inc., at test sites located throughout North America and internationally. Once a candidate has submitted all the required information and has been approved to take the certification exam, CSA Group will send the candidate notice within 2 -3 business days, a "Notice to Schedule" (NTS) which includes instructions on scheduling their exam session. Once the candidate receives their NTS, they will be able to register for the exam at the test site/date they choose. Candidates must submit the scheduling request at least 10 business days prior to the requested examination date. Applicants should save all examination scheduling verifications for their records. Testing sites are normally within a short driving distance from most candidates.

CSA Group uses computer-based testing (CBT) to deliver its certification examinations. However, in certain situations, paper-based tests may be offered following specific industry events or following selected training courses when a certified exam proctor is available. Please refer to CSA Groups' website for a listing of dates/locations for paper-based test delivery. CSA Group reserves the right to cancel a scheduled paper-based test in the event that there are fewer than 10 candidates registered.

Examination Eligibility

The examination eligibility period is six (6) months from the time an application is received. Applicants may take the examination a total of three times within the six month period if they did not pass on the first attempt. (As noted below, re-examination fees apply to the second and third attempts to pass the examination.)

Certification Process

Re-examination

Each applicant is granted a six month eligibility period in which to pass the examination. During the eligibility period, an applicant may take the examination up to three times.

Re-examination fees apply to the second and third attempts to pass the examination, and re-examination fees must be paid in full in order to schedule an exam. If the eligibility period expires without achieving a passing score, the applicant must reapply for the certification.

Examination Language

The CSA Group certification examination for Greenhouse Gas Inventory Quantifiers is administered in English.

Examination Special Accommodation

The administration of the exam may be modified to accommodate special needs at the request of the candidate. Please submit supporting documentation with the completed application.

Certificate Issuance

Each Certified Greenhouse Gas Inventory Quantifier will be issued a certificate indicating the valid timeframe of the certification.

Replacement of Certificates

CSA Group may issue a replacement certificate if a Greenhouse Gas Inventory Quantifier certificate has been lost or destroyed, or if the Certified Greenhouse Gas Inventory Quantifier's name has changed, and the original certificate is returned to the director. A replacement fee will be charged.

Certification Period

CSA Group's Certified Greenhouse Gas Inventory Quantifier (GHG-IQ) certification is valid for a period of 3 years. Certified Greenhouse Gas Inventory Quantifiers are required to submit all required fees during the certification period.

Use and Requirements for Use of Certificates and Logos/Marks

Once an individual receives his/her certification letter and certificate the individual may represent themselves as a Certified Greenhouse Gas Inventory Quantifier (GHG-IQ) under CSA Group's Certified Greenhouse Gas Inventory Quantifier Personnel Certification Program.

Certification under this program does not authorize the certified individual any rights to the use of CSA Groups' name or logo (mark). Use of the mark must be requested in writing and must be expressly authorized by CSA Group. As part of the program monitoring, CSA Groups routinely reviews advertisements, catalogs, websites and promotional material to confirm compliance. Unauthorized use of the CSA Group mark constitutes cause to initiate procedures for withdrawal of certification and in severe cases may constitute grounds for legal action.

Professional Code of Ethics

Certified Greenhouse Gas Inventory Quantifiers affirm adherence to a professional code of ethics. Applicants must review and sign the Code of Ethics when applying to CSA Group for certification. A copy of the Code of Ethics is included in this handbook with the certification application.

Non-Discrimination

Participation in CSA Groups' personnel certification programs is open on a non-discriminatory basis to all individuals and does not require membership in any association.

Certification Process

Confidentiality

CSA Group will maintain confidential information received from the individual and will not disclose such information to any third party without prior written approval by the individual; except in response to a subpoena, court order or other compulsory process. CSA Group will provide written notification to the individual at least five (5) business days prior to releasing such information.

Certification Period

Greenhouse Gas Inventory Quantifier certifications expire every three years.

Recertification Requirements

CSA Group will issue a renewal notice and application form 90 days prior to the date when the certification expires. Certified Greenhouse Gas Inventory Quantifiers, who apply for renewal, meet the renewal qualifications, and pay the required fee will receive a new certificate containing the new expiry date. A Greenhouse Gas Inventory Quantifier may renew their certification in one of two ways:

Option 1:

1. Submit a signed application form including all required information
2. Sign and adhere to the professional code of ethics
3. Submit documentation of three (3) GHG inventory assignments including the following:
 - a. Description of each assignment (role and task/responsibility)
 - b. Contact information of supervisor or client who can testify to the GHG Inventory Quantifier's role and participation
4. Submit all required fees

OR

Option 2:

1. Submit a signed application form including all required information
2. Sign and adhere to the professional code of ethics
3. Submit all required fees
4. Pass a written exam

Refusal to Issue or Renew a Certification

CSA Group may refuse to issue or renew a Greenhouse Gas Inventory Quantifier's certificate:

1. For any of the circumstances under which CSA Group can revoke or suspend a certificate; or
2. The certificate to be renewed was revoked or suspended by CSA Group.

Revocation or Suspension of a Certification

CSA Group reserves the right to withdraw the certification of any person violating the policies and procedures of the certification process.

CSA Group may revoke or suspend a Greenhouse Gas Inventory Quantifier's certification for any of the following reasons:

1. The application was fraudulent or contained inaccurate information;
2. The person was discharged from his/her employment for incompetence, unless the person has not yet exhausted the rights of appeal available in his/her organization;
3. The person has previously had a Certified Greenhouse Gas Inventory Quantifier Certification revoked; or
4. The person has failed:
 - a. To exercise the level of care, diligence and skill that a reasonably prudent quantifier would be expected to exercise in a similar situation;
 - b. To act honestly, competently and with integrity; or
 - c. To meet or has contravened any condition that is set out in his or her certificate.

Certification Process

Upon a notice of termination of a GHG-IQ certification, the individual will immediately terminate the use of CSA Group' certification mark, if permission for use of the mark had been granted. Additionally, the individual will cease all use of or reference to the CSA Group certification and the GHG-IQ designation. Individuals have the right to appeal as outlined in the appeals process below.

Voluntary Withdrawal of Certification

Individuals wishing withdrawal of the Greenhouse Gas Inventory Quantifier Certification must submit a request in writing to CSA Group. Once approved, the individual will be removed from the National Registry and must immediately cease any use of or reference to the CSA Group certification.

Individuals wishing to reinstate their certification must apply for certification as outlined in the certification process.

Appeals, Complaints, and Disputes

CSA Group' certification programs are administered and supervised by the U.S. division, CSA America, Inc., in Cleveland Ohio. All challenges to the certification program are governed by CSA Group' Appeals and Complaint Procedures.

Any individual shall have the right to appeal all decisions relating to CSA Group' personnel certification program including, but not limited to: testing, denial or termination of certification. A written notice of intent to appeal shall be sent to CSA Group within five (5) business days of the individual's receipt of the decision, which forms the basis for appeal.

CSA Group shall arrange an appeal meeting with the individual at CSA Group' headquarters or other mutually agreed to location, within ten (10) business days of the receipt of the written request to appeal. The individual and a CSA Group representative, who was not involved in the original decision causing the appeal, will attend and participate in the meeting. At this meeting, the individual may not be represented by counsel unless CSA Group has been notified at least five (5) business days prior to the meeting. CSA Group shall provide its decision within five (5) business days after the meeting has taken place.

If the individual still disputes the decision made by CSA Group after the appeal meeting, the individual has the right to appeal to an independent and impartial Appeals Board as outlined below.

Appeals Board

Upon receipt of a written intent by the individual to appeal to the Appeals Board, CSA Group shall arrange the Appeals Board hearing within ten (10) business days of the receipt of the request and notify the individual and responding parties. The individual may be represented by counsel at this meeting.

No individual or agent thereof, nor any person with any interest, directly or indirectly, in such individual, shall serve on the Appeals Board.

The Appeals Board hearing shall be informal and private. The individual shall be given a full opportunity to present any material or proofs relevant to the issue. Formal rules of evidence shall not be applicable. The Appeals Board shall determine the relevance and materiality of any evidence presented.

When the individual has had a full opportunity to submit their case, the Appeals Board may declare the hearing closed and shall provide the individual and CSA Group with a decision, including a brief description of its reasons, within ten (10) business days. Decisions of the Appeals Board shall be by majority vote.

All costs related to the Appeals Board are the responsibility of the individual and are due within ten (10) business days of the billing, unless the Appeals Board sides with the individual's position, in which case CSA Group will be responsible for the costs.

Examination Preparation and Completion

General Description

The GHG-IQ certification exam consists of approximately 80 multiple-choice questions. Examination questions have only one correct answer. Each exam question is independent and does not rely on the correct answer to any other questions.

CSA Group may include an additional 10 questions in the exam for statistical evaluation of future examination questions. These additional questions are not included as part of the examination score. These questions will not be identified in the exam, so it is important that the candidate answer every question completely. The candidate's grade is based on the number of scored items answered correctly.

The candidate will have four hours (240 minutes) to complete the exam. Exams are closed book. No reference materials may be used during the course of the exam.

Exam Content

The exam is based on categories of tasks and knowledge required by a Greenhouse Gas Inventory Quantifier. The list below outlines the examination content by category for the GHG-IQ Certification.

Categories:

- GHG inventory boundary setting
- Plan a GHG inventory process
- Data collection and organization methods
- Calculate and analyze emissions results
- Compile and organize documentation and prepare reports

Pass-Fail Standard

CSA Group' Greenhouse Gas Inventory Quantifier certification examination passing standard is established utilizing standard psychometric guidelines and is determined using a criterion-reference technique. A criterion-referencing score judges a candidate based on a predetermined standard of knowledge or skill. This predetermined standard is defined as the minimum score that would be expected from candidates who have the level of knowledge and skills needed to competently conduct their work responsibilities.

Exam Delivery

The GHG-IQ certification exam will be delivered electronically at our computer-based testing center locations on demand, or as a written (paper and pencil) exam during scheduled exam sessions.

Examination General Instructions

During the exam, the proctor will be responsible for supervising the exam in such a way as to ensure that exam security is maintained. As such, all candidates are expected to adhere to the following guidelines during the test sessions.

A candidate's participation in any irregularities occurring during the examination, such as giving or obtaining unauthorized information or aid, as evidenced by an observation or subsequent statistical analysis, may be sufficient cause to terminate participation, invalidate the results of the examination, or other appropriate remedy.

Examination Preparation and Completion

To be admitted to the examination the candidate must:

- Submit their **test authorization code** to the proctor.
- Bring **current photo identification with signature** (driver's license, immigration card, passport, etc.). **The candidate will NOT be admitted without proper identification.** If there are any questions concerning the type of picture ID, the candidate should contact CSA Group.
- Report on time.

During the Exam:

- Smoking is NOT permitted in the examination site.
- Food and beverages are NOT allowed in the examination area.
- All personal items including books, notebooks, other papers, all electronic equipment (i.e. cell phones, cameras, etc.), book bags, coats, etc. will NOT be allowed in the exam room and must be left outside of the exam room **AT YOUR OWN RISK.**
- Friends and relatives, including children, will NOT be allowed in the examination building.
- Computer-based testing facilities offer exam services to multiple agencies. There may be other individuals in the testing room with the candidate who are sitting for exams from different organizations. The rules for their exam may be slightly different than the rules for the CSA candidate's exam in terms of exam time, and what is and is not allowed at their station.
- Computer-based tests are delivered via secure Internet connections. Internet connections are subject to the local Internet providers in the area. While it is not the norm, Internet connections can, on occasion, be lost momentarily, requiring the proctor to log the candidate back into the examination. If this occurs, the candidate should inform the proctor that the connection has been lost and the proctor will assist the candidate in logging back into the exam. The exam time remaining will be exactly the same as it was when the Internet connection was lost.

Acceptable Items:

- An online calculator will be available at CSA Group HOST test sites when taking the computer-based exam. However, if preferred, candidates will be permitted to bring their own battery-operated non-programmable calculator.

Prohibited Items:

Candidates are expressly prohibited from bringing the following items into the exam room:

- cameras, cell phones, optical readers, or other electronic devices that include the ability to photograph, photocopy or otherwise copy test materials
- notes, books, dictionaries or language dictionaries
- book bags or luggage
- ipods, mp3 players, headphones, or pagers
- calculators (except as expressly permitted by the test sponsor), computers, PDAs, or other electronic devices with one or more memories
- personal writing utensils (i.e., pencils, pens, and highlighters)
- watches
- food and beverage
- hats, hoods, or other headgear

If the proctor determines that the candidate has brought any such items to the test site, the items may be demanded and held by testing center staff. Test center reserves the right to review the memory of any electronic device to determine whether any test materials have been photographed or otherwise copied. If the review determines that any test materials are in the memory of any such device, the test center reserves the right to delete such materials and/or retain them for subsequent disciplinary action. Upon completion of the review and any applicable deletions, the test center will return the device to the candidate, but will not be responsible for the deletion of any materials that may result from our review, whether or not such materials are test materials. By bringing any such device into the test site in contravention of our policies, the candidate expressly waives any confidentiality or other similar rights with respect to the candidate's device, our review of the memory of the candidate's device and/or the deletion

Examination Preparation and Completion

of any materials. The test vendor, the examination site, and the test administration staff are not liable for lost or damaged items brought to the examination site.

Environment

Examination room temperature can be unpredictable; therefore, we suggest that the candidate bring appropriate clothing (e.g. sweater or sweatshirt without pockets) to help to adapt to a cooler or warmer climate in the examination room. The candidate should bring ear plugs if he/she is sensitive to noise.

Exam Security

All content, specifically questions and answers are the proprietary and confidential property of CSA Group. They may not be copied, reproduced, modified, published, transmitted, or distributed in any manner without the express written authorization of CSA Group. Candidates must take no action to compromise the integrity or confidential nature of the exam and its contents.

Exam Results Notification

Approximately two weeks after completion of the exam, the candidate will receive official notification of the exam score from CSA Group. Candidates passing the exam and fulfilling all program requirements will also receive a certificate with the effective date of certification. In order to protect the candidate's confidentiality, under no circumstances will test scores be given by telephone or e-mail.

Examination Body of Knowledge and Blueprint

Examination Knowledge Reference Documents

The Greenhouse Gas Inventory Quantifier exam is protocol neutral but draws on concepts included in the following standards and materials. They are helpful reference materials to use in preparation for the exam:

International

2006 IPCC Guidelines for National Greenhouse Gas Inventories

<http://www.ipcc-nggip.iges.or.jp/>

The Greenhouse Gas Protocol (GHGP) - A Corporate Accounting and Reporting Standard – WBCSD and WRI. Revised Edition 2004

<http://www.ghgprotocol.org/standards/corporate-standard>

ISO 14064-1- Greenhouse gases -- Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.

ISO 14064-3 - Greenhouse gases -- Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions.

<http://www.csa.ca/> <http://webstore.ansi.org/>

US GHG Programs

The Climate Registry – General Reporting Protocol. Version 1.1. May 2008 (updated April 2009)

<http://www.theclimateregistry.org/resources/protocols/general-reporting-protocol/>

The Climate Registry – General Verification Protocol Version 1.0 May 2008 (updated March 2009)

<http://www.theclimateregistry.org/resources/verification/general-verification-protocol/>

California Climate Action Registry (CCAR) – General Reporting Protocol Version 3.0 April 2008

http://www.climateregistry.org/resources/docs/protocols/grp/GRP_V3_April2008_FINAL.pdf

California Air Resources Board Mandatory Reporting of Greenhouse Gas Emissions Final Regulation Order, October 2008

<http://www.arb.ca.gov/regact/2007/ghg2007/froghg.pdf>

Examination Body of Knowledge and Blueprint

Exam Abbreviations and Acronyms

There are a number of abbreviations and acronyms throughout the certification exam common to the greenhouse gas community. All candidates should familiarize themselves with the following in preparation for the certification exam.

Btu	British thermal unit
CDM	Clean Development Mechanism
CEMS	Continuous Emission Monitoring System
CH₄	Methane
CER	Certified Emission Reduction
CO₂	Carbon Dioxide
CO₂e	Carbon Dioxide Equivalent (also CO ₂ -e)
EHS	Environmental Health & Safety (also EH&S)
EU ETS	European Union Emissions Allowance Trading Scheme
g	Gram
g/L	Grams per liter (litre)
GHG	Greenhouse Gas
GHGP	Greenhouse Gas Protocol
GJ	Gigajoule
GW	Gigawatt
GWh	Gigawatt hour
GWP	Global Warming Potential
HFCs	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
ISO	International Standards Organization
J	Joule
J/s	Joules per second
kg	Kilogram
kJ	Kilojoule
kWh	Kilowatt-hour
lb	Pound
L	Liter (litre)
m³/s	Cubic meter per second
Mg	Megagram
MJ	Megajoule
MMBtu	one million British thermal units
MW	Megawatt
MWh	Megawatt-hour
NO_x	Oxides of nitrogen
N₂O	Nitrous Oxide
PEMS	Predictive Emissions Monitoring System
PFCs	Perfluorocarbons
SCADA	Supervisory Control and Data Acquisition
SI	International System of Units
SF₆	Sulfur Hexafluoride
SO₂	Sulfur dioxide
thm	Therm
T	Tonne or metric ton (1,000 Kg)
Ton	In this context refers to short ton (2,000 lbs)
TJ	Terajoule
UK ETS	United Kingdom Emission Trading Scheme
WBCSD	World Business Council for Sustainable Development
WRI	World Resources Institute

Examination Body of Knowledge and Blueprint

Exam Objectives

The following exam objectives were developed by a group of industry experts. The weighting of each objective was determined through industry survey. The following table outlines the knowledge and skills required for each objective.

1	Understand GHG inventory boundary setting (organizational, geographical, temporal and operational boundaries). 18.5% of exam
1.1	Determine impacts to organizational boundaries.
	Remember • Identify requirements within a standard on organizational boundaries • Identify the actions that cause change on organizational boundaries • Organic growth or decline • Mergers and acquisitions • Divestitures • Leases ◦ Operational ◦ Capital • Subcontracting/outsourcing
	Understand/Apply • Apply the requirements of a specific GHG accounting approach • Interpret the impact of a corporate change on the GHG accounting procedures
	Analyze/Evaluate • Evaluate the impact of the change to the organizational boundaries
1.2	Determine how operational boundaries are impacted.
	Remember • List the six Kyoto gasses • List the three categories of emission sources
	Understand/Apply • Arrange the six Kyoto gasses in order of Global Warming Potential (GWP) • Differentiate between the three categories of emission sources
1.3	Identify emission sources, such as from a process flow diagram or a site visit.
	Remember • Recognize SSRs (Sources, Sinks and Reservoirs) from a flow diagram or during a site visit • Identify potential emission sources
	Understand/Apply • Given a scenario, determine if the activity produces GHG emissions that should be accounted for • Categorize emission sources ◦ Mobile ◦ Stationary ◦ Fugitive ◦ Process ◦ Scopes
	Analyze/Evaluate • Given a scenario, justify a categorization • Given a scenario, justify inclusion or exclusion

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1.4	Given a scenario, evaluate a base year recalculation
	Remember - Identify requirements in quantification protocols relating to base years - Identify needs of intended user
	Understand/Apply - Compare different approaches for determining the base year - Explain potential impacts of mergers, acquisitions and divestitures on the base year - Explain approaches for base year calculation - Explain impact of significance threshold on base years - Explain when recalculation of intermediate years may be necessary
	Analyze/Evaluate - Assess the impact of mergers, acquisitions and divestitures on the base year recalculation - Assess the impact of quantification method changes on the base year recalculation - Assess whether a single year, multi-year average, or rolling base year approach is appropriate.

2	Understand how to plan a GHG inventory process 36.25% of exam
2.1	Identify principles and objectives for managing GHG information to facilitate verifiability.
	Remember - List essential items required by the protocol that ensure verifiability - Identify the structure and processes of other organizational information management systems
	Understand/Apply - Explain best practices in GHG information management - Use guiding principles from appropriate protocol(s) to interpret requirements - Completeness - Transparency - Consistency - Accuracy - Relevance - Give examples of information management systems that provide verifiable information
	Analyze/Evaluate - Differentiate between verifiable and non-verifiable GHG information management systems and practices - Determine if guiding principles have been applied correctly
2.2	Understand the basic concepts related to GHG accounting.
	Remember - Identify the six Kyoto GHGs and differentiate them from non-Kyoto GHGs - Identify the main sources of the GHGs - Identify the GHG source categories
	Understand/Apply - Differentiate GHG inventory accounting issues from project accounting issues (e.g., additionality, baseline setting, boundaries, etc.) - Understand basic carbon accounting rules - Understand the key concepts of basic GHG science - Decide upon the appropriate resource for information regarding emerging GHG accounting issues - Define the terms of basic GHG accounting

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2.3	Develop methods for collecting and managing data, and prepare that data for verification
	Remember - Identify methods for data collection, manipulation, analysis and archiving - Identify the sources of data that are consistent with the reporting protocol
	Understand/Apply - Explain why chosen data collection methods are appropriate - Demonstrate that data are verifiable
	Analyze/Evaluate - Compare and contrast data collection methods - Distinguish between verifiable and unverifiable data
2.4	Identify the appropriate source (e.g., reliance documents, data owner) to obtain required information.
	Remember - Identify key information sources within an organization - Match necessary documentation with the applicable data owner
	Understand/Apply - Explain how to collect the relevant information from the organization's information source - Distinguish the appropriate source of information to ensure accuracy and verifiability
	Analyze/Evaluate Justify the selection of an information resource for a specific application
2.5	Determine scope of emissions.
	Remember List all direct (Scope 1), energy indirect (Scope 2) and other indirect (Scope 3) emissions
	Understand/Apply - Given a scenario, classify emission sources into the appropriate scopes of emission - Explain the concept of de minimis emission sources
	Analyze/Evaluate - Given a consolidation method, justify the categorization of sources - Complex leasing arrangements - Biogenic emission sources - Mobile sources - Determine when the use of de minimis exclusions is appropriate
2.6	Outline an inventory development and management plan.
	Remember - Identify best practices for developing inventory management plans - List key elements of an inventory management plan - Boundary descriptions - Data sources - Roles and responsibilities of team members - Timelines and deliverables - Assumptions and data quantification methods - Data collection archive - Policies and procedures
	Understand/Apply - Gives examples of key elements of an inventory management plan - Distinguish important steps for preparing an information management plan
	Analyze/Evaluate Analyze the content of an inventory management plan to ensure inclusion of key elements

Examination Body of Knowledge and Blueprint

2.7	Explain QA/QC process or internal control procedures.
	Remember - Identify best practices for QA/QC - Identify internal organizational QA/QC
	Understand/Apply - Explain the difference between quality assurance (QA) and quality control (QC) - Given a QA/QC procedure, explain how to execute it - Given a QA/QC procedure, explain when to execute it
	Analyze/Evaluate Given a scenario, justify the QA/QC procedure selection

3	Explain data collection and organization methods. 11.25% of exam
3.1	Identify methods for organizing data (R)
	Remember - Identify methods for organizing data for the protocol - Identify methods for converting data units
	Understand/Apply - Convert data from imperial to metric units and vice versa - Extrapolate an incomplete data set - Consolidate data sets - Source consolidation - Organization consolidation - Scope consolidation
3.2	Choose, develop and apply appropriate quantification methods for individual emission sources.
	Remember - Identify the appropriate quantification methods specified in a protocol - List appropriate quantification methods for common emission categories - Mobile - Stationary - Fugitive - Process - Identify when a site-specific factor is more appropriate than a default factor
	Understand/Apply - Given a scenario, determine if input (e.g., spreadsheet, CRIS) or calculation is required for a given emission source - Given a scenario, develop a site-specified emissions factor
	Analyze/Evaluate - Given a scenario, determine whether default methods or custom methods are appropriate - Given a scenario, determine appropriate conversion factor - Given a scenario, determine appropriate extrapolation to complete a data set - Given a scenario, determine appropriate consolidation method

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4	Use data to calculate and analyze emissions results 21.5% of exam
4.1	Perform emissions calculations.
	Remember - Identify methods and identify tools for performing emissions calculations - Identify key assumptions, variables and constants used in calculation methods
	Understand/Apply Given a method, calculate emission results
4.2	Compile results for analysis purposes.
	Remember - List emission categories - Identify reporting requirements of the protocol or aggregation of results - Identify geographic or organizational/operational boundaries
	Understand/Apply - Given data, calculate and aggregate results - Along organizational lines - Along geographic lines - Along emission source lines - Along gasses and scope lines - Given a scenario or data set, interpret the data analysis request from various stakeholders - Senior management - Shareholders - Verifiers
	Analyze/Evaluate Analyze the data to obtain the result
4.3	Perform QA/QC for the purpose of producing an accurate GHG emissions result and facilitate verifiability.
	Remember Identify QA/QC methods
	Understand/Apply Given a scenario, apply appropriate QA/QC method
	Analyze/Evaluate Given a scenario, evaluate QA/QC results to determine if emission result was accurate
5	Compile and organize documentation and prepare reports. 12.5% of exam
5.1	Determine appropriate documentation to be retained.
	Remember - Identify appropriate documentation to be retained - Identify industry best practices for data archiving and document retention - Identify internal organization practices for data archiving and document retention
	Understand/Apply Given a scenario, determine appropriate methods for data archiving and document retention to ensure verifiability of the GHG inventory
	Analyze/Evaluate Given a scenario, recommend improvements to an organization's data archiving and document retention systems

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5.2	Given a scenario, interpret emission results.
	Remember • Identify the needs of the intended users • Identify reporting requirements of the protocol
	Understand/Apply • Given a scenario, present emission results to meet the needs of intended users • Given a scenario, present emission results to meet reporting requirements of the protocol
	Analyze/Evaluate • Given a request for data interpretation, determine the appropriate data analysis and presentation method
5.3	Explain emission results to meet the needs of the intended user.
	Remember • Identify appropriate presentation approaches • Identify appropriate terminology • Identify reporting requirements of a given protocol
	Understand/Apply • Explain trends • Explain significant changes • Explain performance metrics • Explain the limitations of emission results
	Analyze/Evaluate • Evaluate importance of changes made • Evaluate significance of trends in emissions • Evaluate significance of intensity metrics