ประกาศกระทรวงอุตสาหกรรม

ฉบับที่ ๓๙๘๘ (พ.ศ. ๒๕๕๒)

ออกตามความในพระราชบัญญัติมาตรฐานผลิตภัณฑ์อุตสาหกรรม

พ.ศ. ๒๕๑๑

เรื่อง กำหนดมาตรฐานผลิตภัณฑ์อุตสาหกรรม

ก๊าซเรือนกระจก :

เล่ม 2 ข้อกำหนดและข้อแนะนำระดับโครงการสำหรับการวัดปริมาณ การติดตามตรวจสอบ และการรายงานผลการปลดปล่อย หรือการลดปริมาณก๊าซเรือนกระจก

อาศัยอำนาจตามความในมาตรา ๑๕ แห่งพระราชบัญญัติมาตรฐานผลิตภัณฑ์อุตสาหกรรม พ.ศ. ๒๕๑๑ รัฐมนตรีว่าการกระทรวงอุตสาหกรรมออกประกาศกำหนดมาตรฐานผลิตภัณฑ์อุตสาหกรรม ก๊าซเรือนกระจก : เล่ม 2 ข้อกำหนดและข้อแนะนำระดับโครงการสำหรับการวัดปริมาณ การติดตามตรวจสอบ และการรายงานผลการปลดปล่อย หรือการลดปริมาณก๊าซเรือนกระจก มาตรฐานเลขที่ มอก. 14064 เล่ม 2 - 2552 ไว้ ดังมีรายการละเอียดต่อท้ายประกาศนี้

ประกาศ ณ วันที่ ๗ พฤษภาคม พ.ศ. ๒๕๕๒

ชาญชัย ชัยรุ่งเรือง

รัฐมนตรีว่าการกระทรวงอุตสาหกรรม

มาตรฐานผลิตภัณฑ์อุตสาหกรรม

ก๊าซเรือนกระจก :

เล่ม 2 ข้อกำหนดและข้อแนะนำระดับโครงการสำหรับการวัดปริมาณ การติดตามตรวจสอบ และการรายงานผลการปลดปล่อย หรือการลดปริมาณก๊าซเรือนกระจก

บทนำ

การเปลี่ยนแปลงสภาพอากาศ เป็นปรากฏการณ์ท้าทายที่ทุกชนชาติต้องเผชิญกับการเปลี่ยนแปลงครั้งสำคัญในการควบคุมปริมาณก๊าซเรือนกระจกที่ปลดปล่อยออกไปสู่บรรยากาศของโลก ซึ่งการจัดทำโครงการเกี่ยวกับการลดปริมาณการปลดปล่อยก๊าซเรือนกระจกเป็นส่วนหนึ่งของการควบคุมดังกล่าว โดยมาตรฐานในส่วนนี้เน้นเกี่ยวกับโครงการเกี่ยวกับการลดปริมาณการปลดปล่อยก๊าซเรือนกระจก หรือกิจกรรมที่เกี่ยวข้อง ซึ่งถูกออกแบบมาเพื่อลดการปลดปล่อย ก๊าซเรือนกระจกหรือเพิ่มการลดปริมาณก๊าซเรือนกระจก โดยรวมถึงหลักการ และข้อกำหนดสำหรับการพิจารณาสภาวะอ้างอิงที่คาดว่าจะเกิดขึ้นในกรณีที่ไม่มีโครงการ และสำหรับการติดตามตรวจสอบ การวัดปริมาณและการรายงานผลการดำเนินโครงการ

ขอบข่าย

มาตรฐานผลิตภัณฑ์อุตสาหกรรมนี้ระบุหลักการ และข้อกำหนด และให้คำแนะนำระดับโครงการสำหรับการวัดปริมาณก๊าซเรือนกระจก การติดตามตรวจสอบ และการรายงานกิจกรรมซึ่งมีวัตถุประสงค์ในการลดการปลดปล่อยหรือเพิ่มการลดปริมาณก๊าซเรือนกระจก โดยรวมถึงข้อกำหนดสำหรับการวางแผนโครงการ การระบุและเลือกแหล่งกำเนิด แหล่งดูดซับและแหล่งกักเก็บที่เหมาะสมกับโครงการและสภาวะอ้างอิงที่คาดว่าจะเกิดขึ้นในกรณีที่ไม่มีโครงการ การติดตามตรวจสอบ การวัดปริมาณ การจัดทำเอกสาร การรายงานผลการดำเนินโครงการ และการจัดการข้อมูลคุณภาพ

เอกสารอ้างอิง

ไม่มีเอกสารอ้างอิง

บทนิยาม

ความหมายของคำที่ใช้ในมาตรฐานผลิตภัณฑ์อุตสาหกรรมนี้ ให้เป็นไปตามมาตรฐาน ISO 14064-2:2006 ข้อ 2

หลักการ

หลักการเป็นพื้นฐานสำคัญที่จะทำให้มั่นใจว่าข้อมูลเกี่ยวกับก๊าซเรือนกระจกมีความถูกต้องและมีเหตุผล และเป็นแนวทางในการประยุกต์ใช้ข้อกำหนด

รายละเอียดให้เป็นไปตามมาตรฐาน ISO 14064-2:2006 ข้อ 3.1 ถึง 3.7

ข้อกำหนด

ข้อกำหนดสำหรับโครงการเกี่ยวกับการลดปริมาณการปลดปล่อยก๊าซเรือนกระจกระบุไว้ 13 เรื่อง ได้แก่ ข้อกำหนดทั่วไป การอธิบายโครงการ การระบุแหล่งกำเนิด แหล่งดูดซับและแหล่งกักเก็บก๊าซเรือนกระจกของโครงการ การพิจารณาสภาวะอ้างอิงที่คาดว่าจะเกิดขึ้นในกรณีที่ไม่มีโครงการ การระบุแหล่งกำเนิด แหล่งดูดซับและแหล่งกักเก็บก๊าซเรือนกระจกสำหรับสภาวะอ้างอิงที่คาดว่าจะเกิดขึ้นในกรณีที่ไม่มีโครงการ การเลือกแหล่งกำเนิด แหล่งดูดซับ แหล่งกักเก็บก๊าซเรือนกระจกสำหรับการติดตามตรวจสอบ หรือการประมาณค่าการปลดปล่อยและการลดปริมาณก๊าซเรือนกระจก ปริมาณการปลดปล่อยและ/หรือปริมาณการลดปริมาณก๊าซเรือนกระจก ปริมาณก๊าซเรือนกระจกที่ปลดปล่อยลดลงหรือปริมาณก๊าซเรือนกระจกที่ลดปริมาณได้เพิ่มขึ้น การจัดการคุณภาพข้อมูล การติดตามตรวจสอบโครงการ การจัดทำเอกสารโครงการเกี่ยวกับการลดปริมาณก๊าซเรือนกระจก การตรวจสอบความใช้ได้และ/หรือการทวนสอบโครงการ การรายงานผลโครงการ

รายละเอียดให้เป็นไปตามมาตรฐาน ISO 14064-2:2006 ข้อ 5.1 ถึง 5.13

ภาคผนวก

ข้อแนะนำสำหรับการประยุกต์ใช้มาตรฐาน ISO 14064-2
รายละเอียดให้เป็นไปตามมาตรฐาน ISO 14064-2:2006 Annex A
ศักยภาพการทำให้โลกร้อนของก๊าซเรือนกระจกชนิดต่าง ๆ
รายละเอียดให้เป็นไปตามมาตรฐาน ISO 14064-2:2006 Annex B

ISO copyright office

Case postale 56 • CH-1211 Geneva 20

Tel.+ 41 22 749 01 11

Fax+ 41 22 749 09 47

E-mail : copyright@iso.org

Web : www.iso.org

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 14064-2 was prepared by Technical Committee ISO/TC 207, *Environmental management*.

ISO 14064 consists of the following parts, under the general title *Greenhouse gases*:

— *Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals*

— *Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements*

— *Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions*

Introduction

0.1 Climate change has been identified as one of the greatest challenges facing nations, governments, business and citizens over future decades. Climate change has implications for both human and natural systems and could lead to significant changes in resource use, production and economic activity. In response, international, regional, national, and local initiatives are being developed and implemented to limit greenhouse gas (GHG) concentrations in the Earth's atmosphere. Such GHG initiatives rely on the quantification, monitoring, reporting and verification of GHG emissions and/or removals.

ISO 14064-1 details principles and requirements for designing, developing, managing and reporting organization or company-level GHG inventories. It includes requirements for determining GHG emission boundaries, quantifying an organization's GHG emissions and removals and identifying specific company actions or activities aimed at improving GHG management. It also includes requirements and guidance on inventory quality management, reporting, internal auditing and the organization's responsibilities in verification activities.

This part of ISO 14064 focuses on GHG projects or project-based activities specifically designed to reduce GHG emissions or increase GHG removals. It includes principles and requirements for determining project baseline scenarios and for monitoring, quantifying and reporting project performance relative to the baseline scenario. It provides the basis for GHG projects to be validated and verified.

ISO 14064-3 details principles and requirements for verifying GHG inventories and validating or verifying GHG projects. ISO 14064-3 describes the process for GHG-related validation or verification and specifies components such as validation or verification planning, assessment procedures and the evaluation of organization or project GHG assertions. ISO 14064-3 can be used by organizations or independent parties to validate or verify GHG assertions.

Figure 1 displays relationships among the three parts of ISO 14064.

0.2 ISO 14064 is expected to benefit organizations, governments, project proponents and stakeholders worldwide by providing clarity and consistency for quantifying, monitoring, reporting and validating or verifying GHG inventories or projects. Specifically, use of ISO 14064 could

— enhance the environmental integrity of GHG quantification,

— enhance the credibility, consistency, and transparency of GHG quantification, monitoring and reporting, including GHG project emission reductions and removal enhancements,

— facilitate the development and implementation of organization GHG management strategies and plans,

— facilitate the development and implementation of GHG projects,

— facilitate the ability to track performance and progress in the reduction of GHG emissions and/or increase in GHG removals, and

— facilitate the crediting and trade of GHG emission reductions or removal enhancements.

Users of ISO 14064 could find benefit from some of the following applications:

a) corporate risk management: for example, the identification and management of risks and opportunities;

b) voluntary initiatives: for example, participation in voluntary GHG registry or reporting initiatives;

c) GHG markets: for example, the buying and selling of GHG allowances or credits;

d) regulatory/government reporting: for example, credit for early action, negotiated agreements or national reporting programmes.

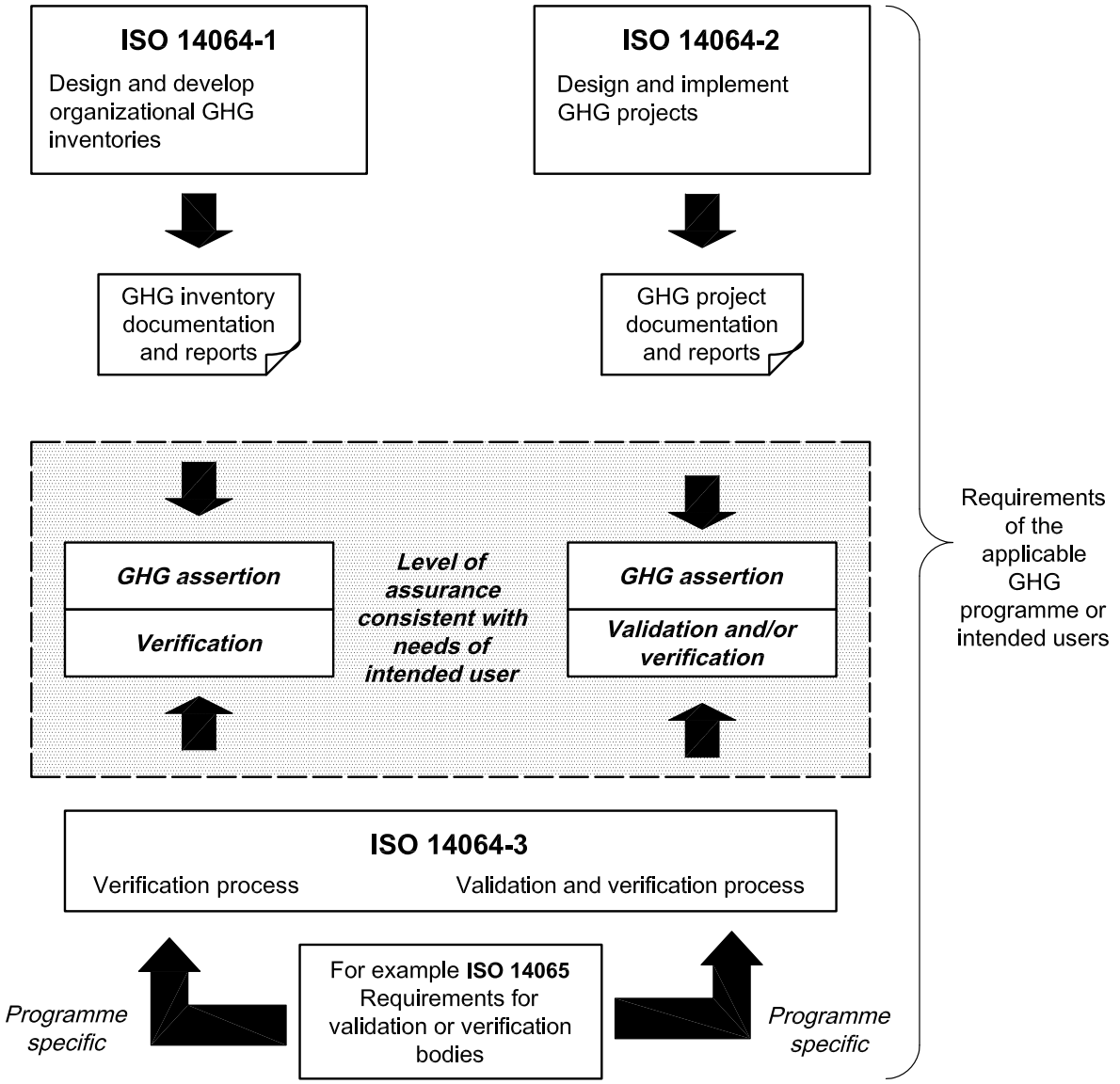


Figure 1 — Relationship between the parts of ISO 14064

0.3 A standardized approach for quantification, monitoring and reporting is required for GHG projects and any resulting GHG emission reductions and/or removal enhancements, in order that they are comparable among intended users and GHG programmes. Accordingly, this part of ISO 14064 specifies a general, GHG programme-neutral framework and uses terms and concepts designed to be compatible with other requirements and guidance from relevant GHG policies and programmes, good practice, legislation and standards. Reference [13] provides an example of good practice guidance.

This part of ISO 14064 deals with the concept of additionality by requiring that the GHG project has resulted in GHG emission reductions or removal enhancements in addition to what would have happened in the absence of that project. It does not use the term “additionality”, prescribe baseline procedures or specify additionality criteria. This part of ISO 14064 requires the project proponent to identify and select GHG sources, sinks and reservoirs relevant for the GHG project and for the baseline scenario. In order to be compatible with the broadest range of GHG programmes, it does not use the term “boundaries” to describe which GHG sources, sinks and/or reservoirs are considered for quantification, monitoring and reporting, but instead uses the concept

of relevant GHG sources, sinks and/or reservoirs. Thus the project proponent may apply additionality criteria and procedures, or define and use boundaries consistent with relevant legislation, policy, GHG programmes and good practice.

Quantification and monitoring of project-level GHG emissions, removals, emission reductions and removal enhancements is challenging because actual project performance is assessed against a hypothetical baseline scenario that represents what would have happened in the absence of the GHG project. Consequently, it is difficult to verify GHG emissions, removals and/or stocks of the baseline scenario. It is therefore important to demonstrate that the baseline scenario is consistent with the principles of this part of ISO 14064, including conservativeness and accuracy, in order to increase the level of confidence that GHG emission reductions and/or removal enhancements are credible and not over-estimated. Generally, the baseline scenario is determined on the basis of an assessment of alternative scenarios. For both the project and the baseline scenario, the quantification, monitoring and reporting of GHG emissions, removals and/or stocks by GHG sources, sinks and reservoirs is based on procedures developed by the project proponent or adopted from recognized authorities.

0.4 This part of ISO 14064 does not specify requirements for validation/verification bodies or validators/verifiers in providing assurance against GHG assertions or claims by GHG projects. Such requirements may be specified by the authority of the applicable GHG programme or can be found in ISO 14064-3. The process to recognize certified GHG emission reductions or removal enhancements as GHG units, credits or offsets is an extension of the GHG project cycle. The certification and crediting process, which may be under the authority of a GHG programme and may vary among GHG programmes, is also not included in the specifications of this part of ISO 14064.

Annex A contains additional information in cases where the project proponent wishes to conform to the United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol's Clean Development Mechanism (CDM) or Joint Implementation (JI) Mechanism.

0.5 Some clauses require users of this part of ISO 14064 to explain the use of certain approaches or decisions taken. Explanation will generally include documentation of the following:

— How approaches were used or decisions taken.

— Why approaches were chosen or decisions made.

Some clauses require users of this part of ISO 14064 to justify the use of certain approaches or decisions taken. Justification will generally include documentation of the following:

— How approaches were used or decisions taken.

— Why approaches were chosen or decisions made.

— Why alternative approaches were not chosen.

Greenhouse gases —

Part 2:
Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements

1 Scope

This part of ISO 14064 specifies principles and requirements and provides guidance at the project level for quantification, monitoring and reporting of activities intended to cause greenhouse gas (GHG) emission reductions or removal enhancements. It includes requirements for planning a GHG project, identifying and selecting GHG sources, sinks and reservoirs relevant to the project and baseline scenario, monitoring, quantifying, documenting and reporting GHG project performance and managing data quality.

ISO 14064 is GHG programme neutral. If a GHG programme is applicable, requirements of that GHG programme are additional to the requirements of ISO 14064.

NOTE If a requirement of ISO 14064 prohibits an organization or GHG project proponent from complying with a requirement of the GHG programme, the requirement of the GHG programme takes precedence.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
greenhouse gas
GHG
gaseous constituent of the atmosphere, both natural and anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds

NOTE GHGs include carbon dioxide (CO_2), methane (CH4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6).

2.2
greenhouse gas source
physical unit or process that releases a GHG into the atmosphere

2.3
greenhouse gas sink
physical unit or process that removes a GHG from the atmosphere

2.4
greenhouse gas reservoir
physical unit or component of the biosphere, geosphere or hydrosphere with the capability to store or accumulate a GHG removed from the atmosphere by a **greenhouse gas sink** (2.3) or a GHG captured from a **greenhouse gas source** (2.2)

NOTE 1 The total mass of carbon contained in a GHG reservoir at a specified point in time could be referred to as the carbon stock of the reservoir.

NOTE 2 A GHG reservoir can transfer greenhouse gases to another GHG reservoir.

NOTE 3 The collection of a GHG from a GHG source before it enters the atmosphere and storage of the collected GHG in a GHG reservoir could be referred to as GHG capture and storage.

2.5
greenhouse gas emission
total mass of a GHG released to the atmosphere over a specified period of time

2.6
greenhouse gas removal
total mass of a GHG removed from the atmosphere over a specified period of time

2.7
greenhouse gas emission reduction
calculated decrease of GHG emissions between a **baseline scenario** (2.19) and the project

2.8
greenhouse gas removal enhancement
calculated increase in GHG removals between a **baseline scenario** (2.19) and the project

2.9
greenhouse gas emission or removal factor
factor relating activity data to GHG emissions or removals

NOTE A greenhouse gas emission or removal factor could include an oxidation component.

2.10
greenhouse gas assertion
declaration or factual and objective statement made by the responsible party

NOTE 1 The GHG assertion may be presented at a point in time or may cover a period of time.

NOTE 2 The GHG assertion provided by the responsible party should be clearly identifiable, capable of consistent evaluation or measurement against suitable criteria by a **validator** (2.27) or **verifier** (2.29).

NOTE 3 The GHG assertion could be provided in the form of a **greenhouse gas report** (2.15) or GHG project plan.

2.11
greenhouse gas information system
policies, processes and procedures to establish, manage and maintain GHG information

2.12
greenhouse gas project
activity or activities that alter the conditions identified in the **baseline scenario** (2.19) which cause **greenhouse gas emission reductions** (2.7) or **greenhouse gas removal enhancements** (2.8)

2.13
greenhouse gas project proponent
individual or organization that has overall control and responsibility for a **greenhouse gas project** (2.12)

2.14
greenhouse gas programme
voluntary or mandatory international, national or sub-national system or scheme that registers, accounts or manages GHG emissions, removals, **greenhouse gas emission reductions** (2.7) or **greenhouse gas removal enhancements** (2.8) outside the organization or **greenhouse gas project** (2.12)

2.15
greenhouse gas report
stand-alone document intended to communicate an organization's or project's GHG-related information to its **intended users** (2.22)

NOTE A GHG report can include a **greenhouse gas assertion** (2.10).

2.16

affected greenhouse gas source, sink or reservoir

GHG source, sink or reservoir influenced by a project activity, through changes in market demand or supply for associated products or services, or through physical displacement

NOTE 1 While related GHG sources, sinks or reservoirs are physically linked to a GHG project, affected GHG sources, sinks or reservoirs are only linked to a GHG project by changes due to market demand and supply.

NOTE 2 An affected GHG source, sink or reservoir is generally off the project site.

NOTE 3 GHG emission reductions or removal enhancements offset by affected GHG sources, sinks or reservoirs are often referred to as leakage.

2.17

controlled greenhouse gas source, sink or reservoir

GHG source, sink or reservoir whose operation is under the direction and influence of the **greenhouse gas project proponent** (2.13) through financial, policy, management or other instruments

NOTE A controlled GHG source, sink or reservoir is generally on the project site.

2.18

related greenhouse gas source, sink or reservoir

GHG source, sink or reservoir that has material or energy flows into, out of, or within the project

NOTE 1 A related GHG source, sink or reservoir is generally upstream or downstream from the project, and can be either on or off the project site.

NOTE 2 A related GHG source, sink or reservoir also may include activities related to design, construction and decommissioning of a project.

2.19

baseline scenario

hypothetical reference case that best represents the conditions most likely to occur in the absence of a proposed **greenhouse gas project** (2.12)

NOTE The baseline scenario concurs with the GHG project timeline.

2.20

global warming potential

GWP

factor describing the radiative forcing impact of one mass-based unit of a given GHG relative to an equivalent unit of carbon dioxide over a given period of time

NOTE Annex B contains global warming potentials produced by the Intergovernmental Panel on Climate Change.

2.21

carbon dioxide equivalent

CO_2e

unit for comparing the radiative forcing of a GHG to carbon dioxide

NOTE 1 The carbon dioxide equivalent is calculated using the mass of a given GHG multiplied by its **global warming potential** (2.20).

NOTE 2 Annex B contains global warming potentials produced by the Intergovernmental Panel on Climate Change.

2.22
intended user
individual or organization identified by those reporting GHG-related information as being the one who relies on that information to make decisions

NOTE The intended user can be the client, the responsible party, GHG programme administrators, regulators, the financial community or other affected **stakeholders** (2.23), such as local communities, government departments or non-governmental organizations.

2.23
stakeholder
individual or organization that is affected by the development or implementation of a **greenhouse gas project** (2.12)

2.24
level of assurance
degree of assurance the **intended user** (2.22) requires in a **validation** (2.26) or **verification** (2.28)

NOTE 1 The level of assurance is used to determine the depth of detail that a validator or verifier designs into their validation or verification plan to determine if there are any material errors, omissions or misrepresentations.

NOTE 2 There are two levels of assurance (reasonable or limited) that result in differently worded validation or verification statements. Refer to ISO 14064-3:2006, A.2.3.2, for examples of validation and verification statements.

2.25
monitoring
continuous or periodic assessment of GHG emissions and removals or other GHG-related data

2.26
validation
systematic, independent and documented process for the evaluation of a **greenhouse gas assertion** (2.10) in a GHG project plan against agreed validation criteria

NOTE 1 In some cases, such as in first-party validations, independence can be demonstrated by the freedom from responsibility for the development of GHG data and information.

NOTE 2 The content of a GHG project plan is described in 5.2.

2.27
validator
competent and independent person or persons with responsibility for performing and reporting on the results of a validation

NOTE This term can be used to refer to a validation body.

2.28
verification
systematic, independent and documented process for the evaluation of a **greenhouse gas assertion** (2.10) against agreed verification criteria

NOTE In some cases, such as in first-party verifications, independence can be demonstrated by the freedom from responsibility for the development of GHG data and information.

2.29
verifier
competent and independent person, or persons, with responsibility for performing and reporting on the verification process

NOTE This term can be used to refer to a verification body.

2.30
uncertainty
parameter associated with the result of quantification which characterizes the dispersion of the values that could be reasonably attributed to the quantified amount

NOTE Uncertainty information typically specifies quantitative estimates of the likely dispersion of values and a qualitative description of the likely causes of the dispersion.

3 Principles

3.1 General

The application of principles is fundamental to ensure that GHG-related information is a true and fair account. The principles are the basis for, and will guide the application of, requirements in this part of ISO 14064.

3.2 Relevance

Select the GHG sources, GHG sinks, GHG reservoirs, data and methodologies appropriate to the needs of the intended user.

3.3 Completeness

Include all relevant GHG emissions and removals. Include all relevant information to support criteria and procedures.

3.4 Consistency

Enable meaningful comparisons in GHG-related information.

3.5 Accuracy

Reduce bias and uncertainties as far as is practical.

3.6 Transparency

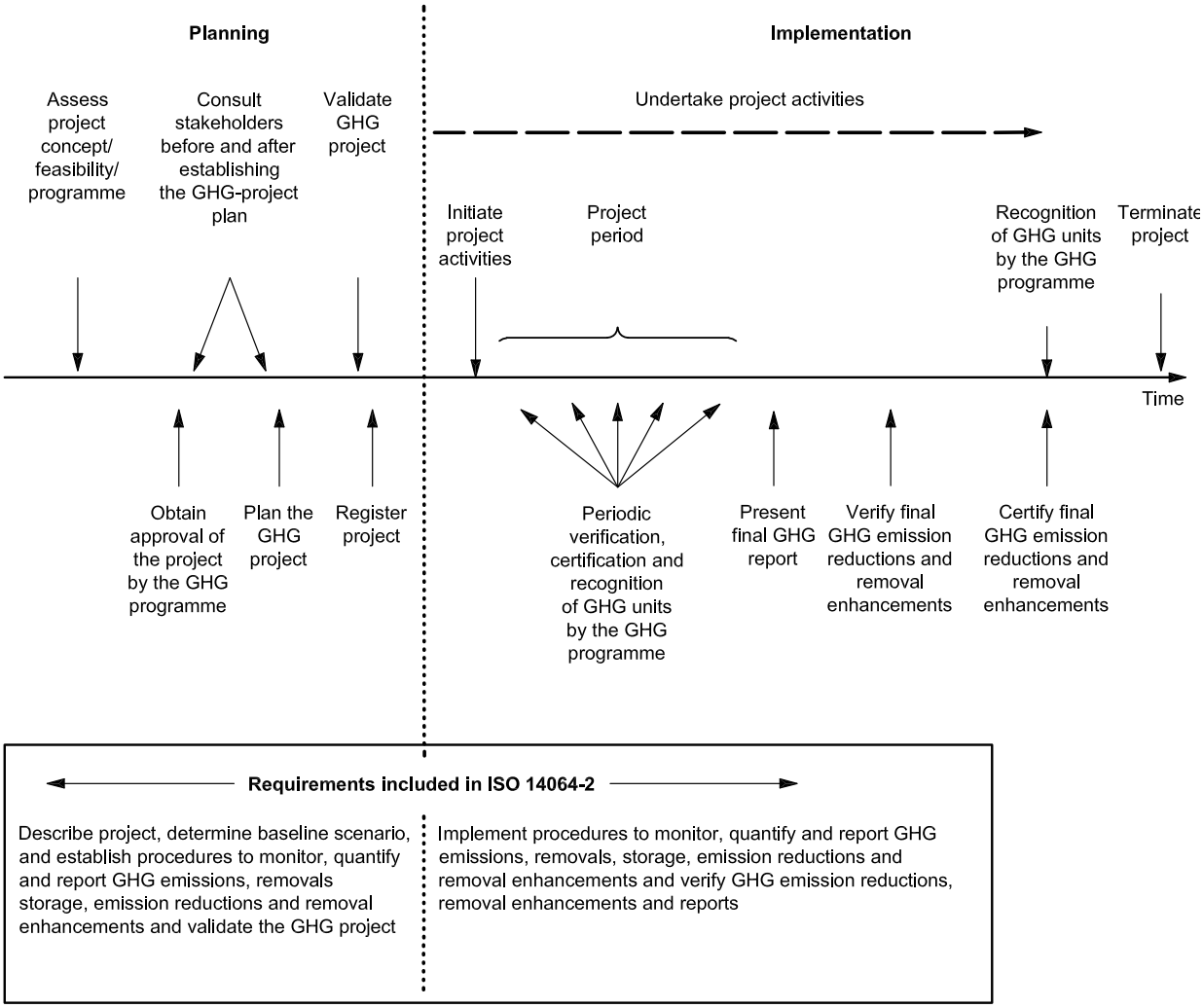
Disclose sufficient and appropriate GHG-related information to allow intended users to make decisions with reasonable confidence.

3.7 Conservativeness

Use conservative assumptions, values and procedures to ensure that GHG emission reductions or removal enhancements are not over-estimated.

4 Introduction to GHG projects

The GHG project cycle is generally characterized by two main phases — a planning phase and an implementation phase. GHG project cycle steps vary depending upon the project's scale and specific circumstances, including applicable legislation, GHG programmes or standards. Whereas this part of ISO 14064 specifies requirements for GHG project quantification, monitoring and reporting, a typical GHG project cycle may include additional elements as shown in Figure 2.



NOTE 1 Not all GHG programmes will require all the elements included in this figure.

NOTE 2 A GHG unit is a unit used for GHG accounting. Common GHG units for GHG projects are certified emission reduction units (CER), emission reduction units (ERU), credits and offsets. GHG units are usually expressed in tonnes of CO_2e.

Figure 2 — A typical GHG project cycle

The GHG project proponent might initially identify the project concept, design the project and evaluate its feasibility, consult stakeholders and assess GHG programme eligibility requirements. As appropriate, the project proponent might seek written approval of project acceptance by the applicable GHG programme or responsible government institution.

For the planning phase, this part of ISO 14064 specifies requirements for establishing and documenting a GHG project. In planning the GHG project, the project proponent

— describes the project,

— identifies and selects GHG sources, sinks and reservoirs relevant for the project,

— determines the baseline scenario, and

— develops procedures to quantify, monitor and report GHG emissions, removals, emission reductions and removal enhancements.

GHG programmes may require official registration, validation and public distribution of a GHG project plan before project implementation.

For the implementation phase, this part of ISO 14064 specifies requirements for the selection and application of criteria and procedures for regular data quality management, monitoring, quantification and reporting of GHG emissions, removals, emission reductions and removal enhancements. Implementation of a GHG project may be initiated by a specific activity (e.g. an action to install, implement, engage or otherwise begin operations) and may end with a specific termination activity (e.g. an action to complete, close, decommission or otherwise formally end the project). The reporting period and frequency may vary based on the specific requirements of the GHG project and/or GHG programme. Based on actual data and information monitored and collected during project implementation, quantified GHG emissions, removals, emission reductions and removal enhancements may be verified. The project proponent might submit verified GHG emission reductions or removal enhancements to a GHG programme in order to generate recognized GHG units within that GHG programme. Certification and recognition of GHG units (e.g. credits) are beyond the scope of this part of ISO 14064.

In order to have broad and flexible application to different GHG project types and sizes, this part of ISO 14064 establishes principles and specifies process requirements rather than prescribing specific criteria and procedures. Therefore, as shown in Figure 3, additional requirements, criteria and guidance from relevant legislation, GHG programmes, good practice and standards are of vital importance for the credible application of this part of ISO 14064.

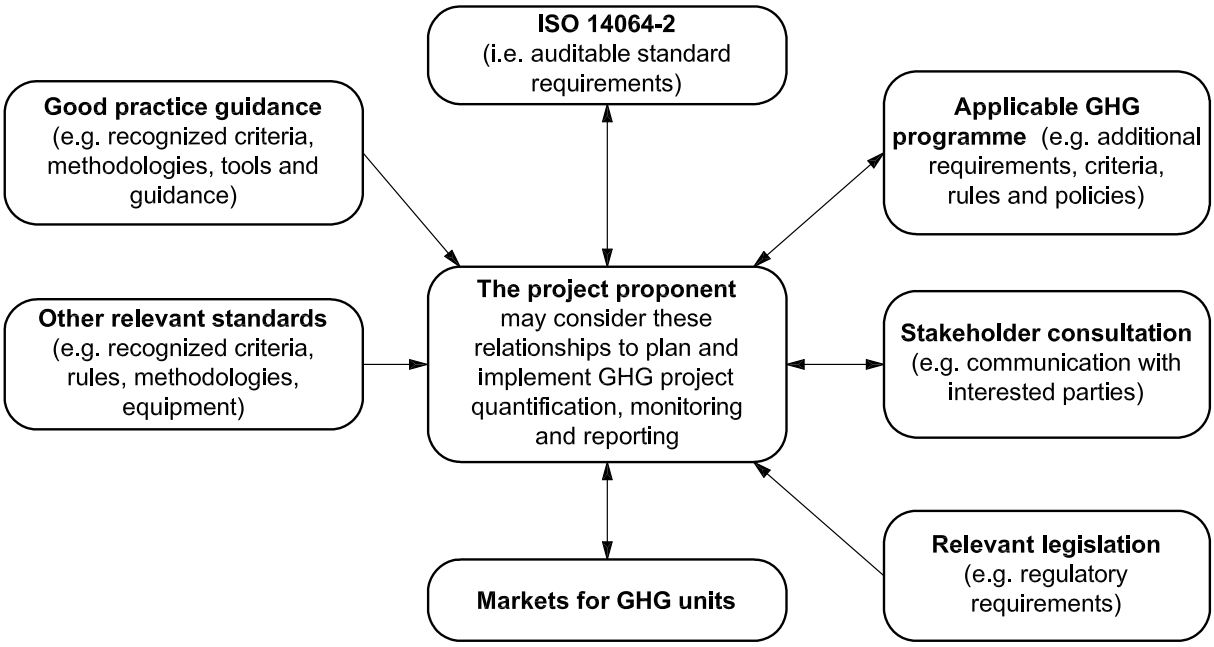


Figure 3 — Framework for the use of ISO 14064-2

Figure 4 illustrates the linkage between planning and implementation phases of a project to the requirements of this part of ISO 14064. In the application of this part of ISO 14064, the user is encouraged to consider all requirements holistically and iteratively rather than a linear stepwise approach.

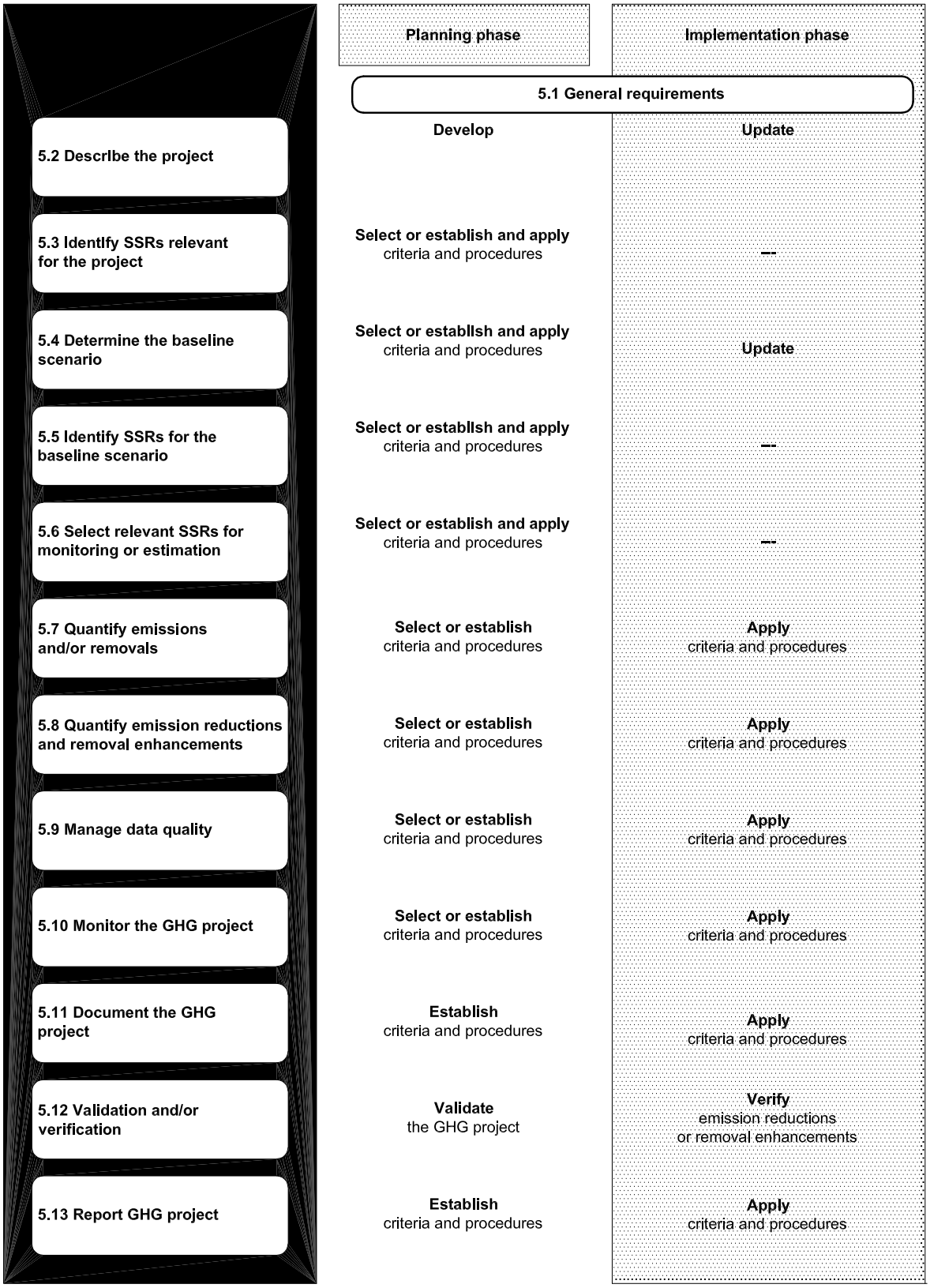


Figure 4 — Linkages between planning and implementation requirements

5 Requirements for GHG projects

5.1 General requirements

The project proponent shall ensure the GHG project conforms to relevant requirements of the GHG programme to which it subscribes (if any), including eligibility or approval criteria, relevant legislation or other requirements.

In fulfilling the detailed requirements of this clause, the project proponent shall identify, consider and use relevant current good practice guidance. The project proponent shall select and apply established criteria and procedures from a recognized origin, if available, as relevant current good practice guidance.

In cases where the project proponent uses criteria and procedures from relevant current good practice guidance that derive from a recognized origin, the project proponent shall justify any departure from those criteria and procedures.

In cases where good practice guidance from more than one recognized origin exists, the project proponent shall justify the reason for using the selected recognized origin.

Where there is no relevant current good practice guidance from a recognized origin, the project proponent shall establish, justify and apply criteria and procedures to fulfil the requirements in this part of ISO 14064.

5.2 Describing the project

The project proponent shall describe the project and its context in a GHG project plan that includes the following:

a) project title, purpose(s) and objective(s);

b) type of GHG project;

c) project location, including geographic and physical information allowing the unique identification and delineation of the specific extent of the project;

d) conditions prior to project initiation;

e) a description of how the project will achieve GHG emission reductions and/or removal enhancements;

f) project technologies, products, services and the expected level of activity;

g) aggregate GHG emission reductions and removal enhancements, stated in tonnes of CO_2e, likely to occur from the GHG project;

h) identification of risks that may substantially affect the project's GHG emission reductions or removal enhancements;

i) roles and responsibilities, including contact information of the project proponent, other project participants, relevant regulator(s) and/or administrators of any GHG programme(s) to which the GHG project subscribes;

j) any information relevant for the eligibility of a GHG project under a GHG programme and quantification of emission reductions or removal enhancements, including legislative, technical, economic, sectoral, social, environmental, geographic, site-specific and temporal information;

k) a summary environmental impact assessment when such an assessment is required by applicable legislation or regulation;

l) relevant outcomes from stakeholder consultations and mechanisms for on-going communication;

m) chronological plan for the date of initiating project activities, date of terminating the project, frequency of monitoring and reporting and the project period, including relevant project activities in each step of the GHG project cycle.

5.3 Identifying GHG sources, sinks and reservoirs relevant to the project

The project proponent shall select or establish criteria and procedures for identifying and assessing GHG sources, sinks and reservoirs controlled, related to, or affected by the project.

Based on selected or established criteria and procedures, the project proponent shall identify GHG sources, sinks and reservoirs as being

a) controlled by the project proponent,

b) related to the GHG project, or

c) affected by the GHG project.

5.4 Determining the baseline scenario

The project proponent shall select or establish criteria and procedures for identifying and assessing potential baseline scenarios considering the following:

a) the project description, including identified GHG sources, sinks and reservoirs (see 5.3);

b) existing and alternative project types, activities and technologies providing equivalent type and level of activity of products or services to the project;

c) data availability, reliability and limitations;

d) other relevant information concerning present or future conditions, such as legislative, technical, economic, sociocultural, environmental, geographic, site-specific and temporal assumptions or projections.

The project proponent shall demonstrate equivalence in type and level of activity of products or services provided between the project and the baseline scenario and shall explain, as appropriate, any significant differences between the project and the baseline scenario.

The project proponent shall select or establish, explain and apply criteria and procedures for identifying and justifying the baseline scenario.

NOTE A baseline scenario determined using a project-specific approach represents what would occur in the absence of the project, whereas a GHG programme can prescribe another approach to determine the baseline scenario, such as a performance standard (e.g. benchmark or multi-project) baseline scenario.

In developing the baseline scenario, the project proponent shall select the assumptions, values and procedures that help ensure that GHG emissions reductions or removal enhancements are not over-estimated.

The project proponent shall select or establish, justify and apply criteria and procedures for demonstrating that the project results in GHG emissions reductions or removal enhancements that are additional to what would occur in the baseline scenario.

5.5 Identifying GHG sources, sinks and reservoirs for the baseline scenario

In identifying GHG sources, sinks and reservoirs relevant to the baseline scenario, the project proponent

a) shall consider criteria and procedures used for identifying the GHG sources, sinks and reservoirs relevant for the project,

b) if necessary, shall explain and apply additional criteria for identifying relevant baseline GHG sources, sinks and reservoirs, and

c) shall compare the project's identified GHG sources, sinks and reservoirs with those identified in the baseline scenario.

5.6 Selecting relevant GHG sources, sinks and reservoirs for monitoring or estimating GHG emissions and removals

The project proponent shall select or establish criteria and procedures for selecting relevant GHG sources, sinks and reservoirs for either regular monitoring or estimation.

The project proponent shall justify not selecting any relevant GHG source, sink and reservoir for regular monitoring.

NOTE Figure A.2 shows a possible framework for identifying and selecting GHG sources, sinks and reservoirs for regular monitoring or estimating GHG emissions or removals.

5.7 Quantifying GHG emissions and/or removals

The project proponent shall select or establish criteria, procedures and/or methodologies for quantifying GHG emissions and/or removals for selected GHG sources, sinks and/or reservoirs (see 5.6).

Based on selected or established criteria and procedures, the project proponent shall quantify GHG emissions and/or removals separately for

a) each relevant GHG for each GHG source, sink and/or reservoir relevant for the project, and

b) each GHG source, sink and/or reservoir relevant for the baseline scenario.

When highly uncertain data and information are relied upon, the project proponent shall select assumptions and values that ensure that the quantification does not lead to over-estimation of GHG emissions reductions or removal enhancements.

The project proponent shall estimate GHG emissions and/or removals by GHG sources, sinks and reservoirs relevant for the project and relevant for the baseline scenario, but not selected for regular monitoring.

The project proponent shall establish and apply criteria, procedures and/or methodologies to assess the risk of a reversal of a GHG emission reduction or removal enhancement (i.e. permanence of GHG emission reduction or removal enhancement).

If applicable, the project proponent shall select or develop GHG emissions or removal factors that

— are derived from a recognized origin,

— are appropriate for the GHG source or sink concerned,

— are current at the time of quantification,

— take account of the quantification uncertainty and are calculated in a manner intended to yield accurate and reproducible results, and

— are consistent with the intended use of the GHG report.

5.8 Quantifying GHG emission reductions and removal enhancements

The project proponent shall select or establish criteria, procedures and/or methodologies for quantifying GHG emission reductions and removal enhancements during project implementation.

The project proponent shall apply the criteria and methodologies selected or established to quantify GHG emission reductions and removal enhancements for the GHG project. GHG emission reductions or removal enhancements shall be quantified as the difference between the GHG emissions and/or removals from GHG sources, sinks and reservoirs relevant for the project and those relevant for the baseline scenario.

The project proponent shall quantify, as appropriate, GHG emission reductions and removal enhancements separately for each relevant GHG and its corresponding GHG sources, sinks and/or reservoirs for the project and the baseline scenario.

The project proponent shall use tonnes as the unit of measure and shall convert the quantity of each type of GHG to tonnes of CO_2e using appropriate GWPs.

NOTE Annex B contains GWPs produced by the Intergovernmental Panel on Climate Change.

5.9 Managing data quality

The project proponent shall establish and apply quality management procedures to manage data and information, including the assessment of uncertainty, relevant to the project and baseline scenario.

The project proponent should reduce, as far as is practical, uncertainties related to the quantification of GHG emission reductions or removal enhancements.

5.10 Monitoring the GHG project

The project proponent shall establish and maintain criteria and procedures for obtaining, recording, compiling and analysing data and information important for quantifying and reporting GHG emissions and/or removals relevant for the project and baseline scenario (i.e. GHG information system). Monitoring procedures should include the following:

a) purpose of monitoring;

b) types of data and information to be reported, including units of measurement;

c) origin of the data;

d) monitoring methodologies, including estimation, modelling, measurement or calculation approaches;

e) monitoring times and periods, considering the needs of intended users;

f) monitoring roles and responsibilities;

g) GHG information management systems, including the location and retention of stored data.

Where measurement and monitoring equipment is used, the project proponent shall ensure the equipment is calibrated according to current good practice.

The project proponent shall apply GHG monitoring criteria and procedures on a regular basis during project implementation.

5.11 Documenting the GHG project

The project proponent shall have documentation that demonstrates conformance of the GHG project with the requirements of this part of ISO 14064. This documentation shall be consistent with validation and verification needs (see 5.12).

5.12 Validation and/or verification of the GHG project

The project proponent should have the GHG project validated and/or verified.

If the project proponent requests validation and/or verification of the GHG project, a GHG assertion shall be presented by the project proponent to the validator or verifier.

The project proponent should ensure that the validation or verification conforms to the principles and requirements of ISO 14064-3.

5.13 Reporting the GHG project

The project proponent shall prepare and make available to intended users a GHG report. The GHG report

— shall identify the intended use and intended user of the GHG report, and

— shall use a format and include content consistent with the needs of the intended user.

If the project proponent makes a GHG assertion to the public claiming conformance to this part of ISO 14064, the project proponent shall make the following available to the public:

a) an independent third-party validation or verification statement, prepared in accordance with ISO 14064-3, or

b) a GHG report that includes as a minimum:

   1) the name of the project proponent;

   2) the GHG programme(s) to which the GHG project subscribes;

   3) a list of GHG assertions, including a statement of GHG emission reductions and removal enhancements stated in tonnes of CO_2e;

   4) a statement describing whether the GHG assertion has been validated or verified, including the type of validation or verification and level of assurance achieved;

   5) a brief description of the GHG project, including size, location, duration and types of activities;

   6) a statement of the aggregate GHG emissions and/or removals by GHG sources, sinks and reservoirs for the GHG project that are controlled by the project proponent, stated in tonnes of CO_2e, for the relevant time period (e.g. annual, cumulative to date, total);

   7) a statement of the aggregate GHG emissions and/or removals by GHG sources, sinks and reservoirs for the baseline scenario, stated in tonnes of CO_2e for the relevant time period;

   8) a description of the baseline scenario and demonstration that the GHG emission reductions or removal enhancements are additional to what would have happened in the absence of the project;

   9) as applicable, an assessment of permanence;

   10) a general description of the criteria, procedures or good practice guidance used as a basis for the calculation of project GHG emission reductions and removal enhancements;

   11) the date of the report and time period covered.

Annex A
(informative)

Guidance on the use of this part of ISO 14064

A.1 Background

This annex provides guidance on the use of this part of ISO 14064. It does not describe in detail “how” to implement standard requirements because of rapid development in this area. Guidance is provided explaining how concepts contained in this part of ISO 14064 relate to project-based mechanisms under the United Nations Framework Convention on Climate Change's (UNFCCC) Kyoto Protocol.

This part of ISO 14064 is intended for use by project proponents undertaking GHG projects, by validators and verifiers in their assessment of GHG projects, and the managers of voluntary or mandatory GHG programmes. It may be applied to projects in planning or implementation phases.

This part of ISO 14064 outlines principles and specifies process requirements rather than prescribing specific criteria and procedures. Additional requirements, criteria and guidance from relevant GHG programmes, good practice, legislation and standards are important for the credible application of this part of ISO 14064. Additional guidance, programme requirements and good practice will come from many sources, and are continually evolving.

This part of ISO 14064 is GHG programme neutral but is designed for use with internal or external voluntary or mandatory GHG programmes. Many international and national GHG programmes are currently under development. It is expected that some GHG programmes will have additional requirements, particularly where crediting is concerned.

This part of ISO 14064 does not require the validation or verification of GHG projects directly, nor does it address crediting from GHG projects. As a result, project proponents should consider additional guidance from GHG programme requirements. When used in conjunction with specific GHG programmes, project proponents, validators and verifiers should comply with any additional requirements.

Figure A.1 illustrates the use in ISO 14064 of several definitions related to key carbon cycles, such as

— GHG source,

— GHG sink,

— GHG reservoir,

— GHG emission, and

— GHG removal.

A.2 Principles

A.2.1 General

The principles in this part of ISO 14064 are intended to ensure a fair representation and a credible and balanced account of GHG emission reductions and removal enhancements from projects. Principles are used to assist in the general interpretation of requirements. In particular, the principles are intended to apply when judgement and discretion are called for in fulfilling requirements. The principles form the basis for justifications and explanations required in this part of ISO 14064, and users should make reference to the relevant principles and how they have been applied. The application of each principle will vary according to the nature of the judgement involved. The principles should be applied holistically, with each principle considered within the context of the overall intent of particular clauses. This part of ISO 14064 includes principles common to ISO 14064-1 and unique to this part of ISO 14064.

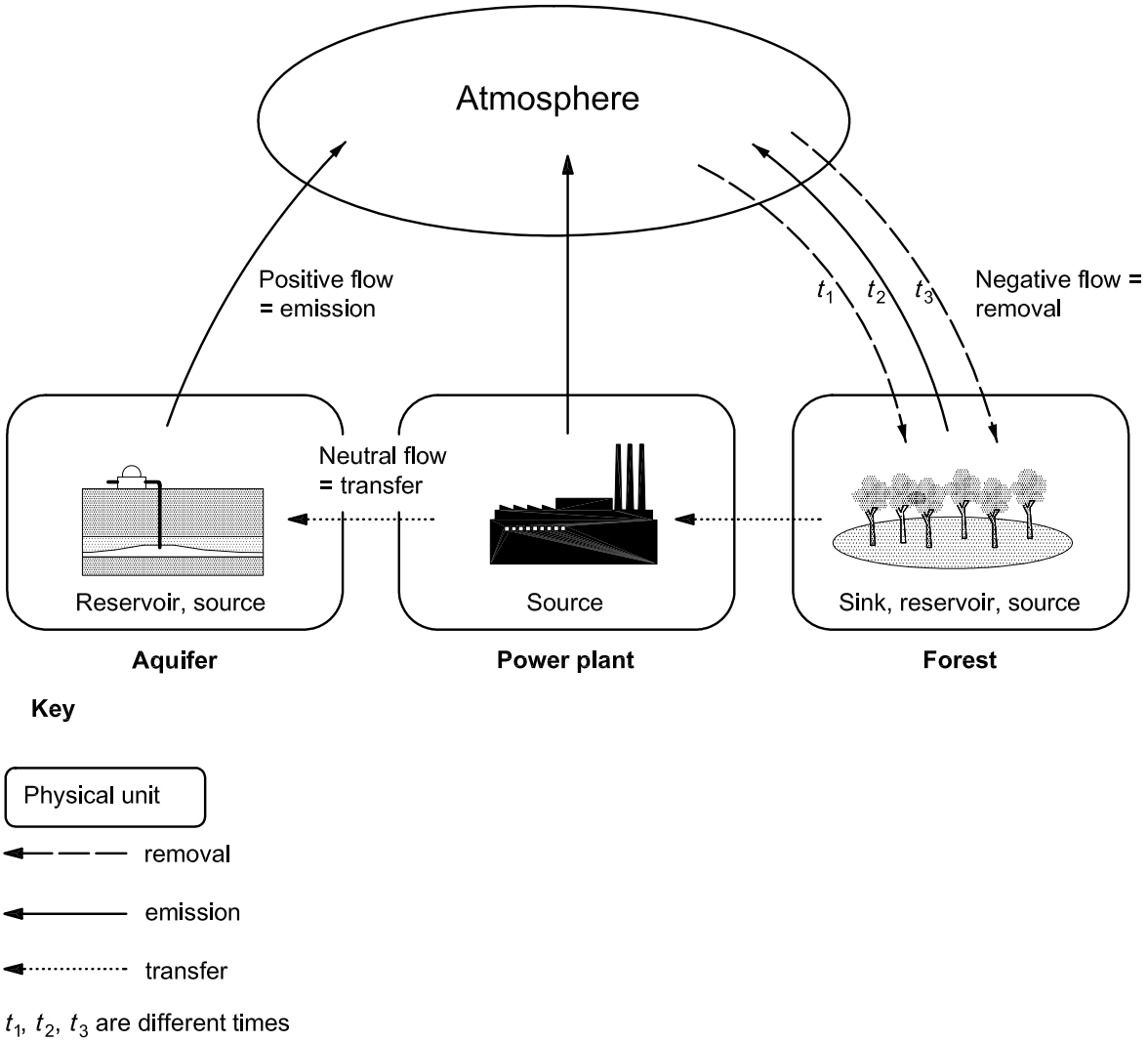


Figure A.1 — Interaction and application of several definitions

A.2.2 Relevance

Relevance is important in the context of selection of

— GHG sources, sinks and reservoirs of the GHG project and the baseline scenario,

— procedures to quantify, monitor or estimate GHG sources, sinks and reservoirs, and

— potential baseline scenarios.

Relevance is assessed against the influence on the decisions or conclusions of intended users of the information and may be implemented by defining and justifying qualitative and/or quantitative criteria. For example, minimum thresholds might be used to justify the aggregation of minor GHG sources or in the choice of quantification methodologies or the number of data points monitored. Implementing the principle of relevance can help reduce the cost of GHG projects. However, users of the information still require the ability to make decisions with reasonable assurance as to the integrity of quantification and reporting.

A.2.3 Completeness

Completeness is usually satisfied by

— identifying all GHG sources, sinks and reservoirs controlled, related to, or affected by the GHG project and corresponding baseline scenario,

— estimating GHG sources, sinks and reservoirs not regularly monitored,

— ensuring that all information relevant to intended users appears in reported GHG data or information in a manner consistent with established project and baseline scenarios, time period and objectives of reporting, or

— considering representative baseline scenarios within the relevant geographic areas and time periods.

Where comparable individual GHG sinks, sources and reservoirs cannot be identified in the baseline scenario, appropriate default values and assumptions are used to define baseline GHG emissions and removals. In the absence of such direct evidence, expert judgement is often required to provide information and guidance in establishing and justifying elements of the GHG project plan and GHG reports. This might include the appropriate use of models and conversion factors, as well as an estimation of uncertainty. The same will also often apply to the project estimations for GHG removal projects.

A.2.4 Consistency

Consistency is usually satisfied by

— using uniform procedures among projects,

— using uniform procedures between the project and the baseline scenario,

— using functionally equivalent units (i.e. the same level of service is provided by the project and the baseline scenario),

— applying tests and assumptions equally across potential baseline scenarios, or

— ensuring the equivalent application of expert judgement, internally and externally, over time and among projects.

The principle of consistency is not intended to prevent the use of more accurate procedures or methodologies as they become available. However, any change in procedures and methodologies should be transparently documented and justified.

A.2.5 Accuracy

Accuracy is usually satisfied by avoiding or eliminating bias from sources within estimations, and through describing and improving precision and uncertainties as far as is practical.

Project proponents should pursue accuracy insofar as possible, but the hypothetical nature of baselines, the high cost of monitoring of some types of GHG emissions and removals, and other limitations make accuracy unattainable in many cases. In these cases, conservativeness serves as a moderator to accuracy in order to maintain the credibility of project GHG quantification.

Accuracy and conservativeness are interrelated principles. Once a project proponent has reduced uncertainty to the extent practicable, the value chosen within that range should result in a conservative estimate of the GHG emission or removal.

A.2.6 Transparency

Transparency relates to the degree to which information is seen as being reported in an open, clear, factual, neutral and coherent manner based on documentation (e.g. an audit trail). Information is recorded, compiled

and analysed in such a way that will enable internal reviewers and external intended users to attest to its credibility. Transparency usually requires the following:

— clearly and explicitly stating and documenting all assumptions;

— clearly referencing background material;

— stating all calculations and methodologies;

— clearly identifying all changes in documentation;

— compiling and documenting information in a manner that enables independent validation and verification;

— documenting the application of principles (e.g. in selecting the baseline scenario);

— documenting the explanation and/or justification (e.g. choice of procedures, methodologies, parameters, data sources, key factors);

— documenting the justification of selected criteria (e.g. for the determination of additionality);

— documenting assumptions, references and methodologies such that another party can reproduce reported data;

— documenting any external factors to the project that may affect the decisions of intended users.

A.2.7 Conservativeness

Conservativeness is usually satisfied by

— the appropriate choice of the path of technological development and the rate of implementation in the relevant geographic area and time periods in the absence of the project,

— taking into account the impact of the project on the path of development and rate of implementation in the relevant geographic area and time periods,

— the appropriate choice of parameters affecting the project's GHG emissions, removals, sources, sinks and reservoirs, or

— providing reliable results maintained over a range of probable assumptions.

The principle of conservativeness is applied when highly uncertain parameters or data sources are relied upon for the determination of the baseline scenario and the quantification of baseline and project GHG emissions and removals. In particular, the conservativeness of the baseline is established with reference to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors so that baseline emissions and removals are more likely to be under-estimated rather than over-estimated, and that reliable results are maintained over a range of probable assumptions. However, using the conservativeness principle does not always imply the use of the “most” conservative choice of assumptions or methodologies. Explanations of how assumptions and choices are conservative should be provided in project documentation. The implementation of the conservativeness principle is frequently a matter of balance (e.g. between accuracy, relevance and cost-effectiveness). When less accurate methods are chosen, more conservative assumptions and methodologies should be applied.

A.3 Requirements for GHG projects

A.3.1 General requirements

Projects may have to comply with relevant standards and legislation as well as good practice. Prior approval of authorities and compliance with standards and legislation may determine the eligibility of the project. The project proponent may have to complete an environmental and social impact assessment, demonstrate a contribution to sustainable development, and plan the project to be consistent with national environment and development priorities and strategies.

This part of ISO 14064 does not differentiate between types and scales of projects. It may be applied to all projects because it provides flexibility in the implementation of the requirements by referring to good practice

guidance. Some GHG programmes (e.g. Kyoto regime) have differentiated between small-scale and other projects and have defined simplified rules that might be used as guidance. Kyoto mechanisms might apply to some types of projects. Relevant Kyoto mechanism requirements are included in A.3.2 as guidance for applicable projects.

A.3.2 Kyoto mechanisms

A.3.2.1 Joint Implementation and Clean Development Mechanism

A.3.2.1.1 Under the Kyoto regime, two project-based mechanisms have been created, as follows:

— the Clean Development Mechanisms (CDM) (see Reference [4], Article 12);

— Joint Implementation (JI) (see Reference [4], Article 6).

References to Kyoto Protocol decisions in this subclause are based on COP or COP/MOP decisions current as of December 2005. Users are encouraged to refer to the most recent COP or COP/MOP decisions.

A.3.2.1.2 The adopted modalities and procedures for the CDM can be found in Reference [2], and for reforestation and afforestation projects in Reference [7]. The CDM Executive Board was established as a supervisory body to the implementation of the CDM, playing a role, for example, in the approval of baseline methodologies and in the registration of projects.[1)] The Executive Board has developed a glossary of approved terminology[8]. A designated operational entity (DOE) has to be accredited by the CDM Executive Board and is an independent entity that is engaged by the project participants to validate the CDM project or to verify and certify its certified emission reductions (CER). Once projects are validated, the DOE requests their registration. Registration is referred to as the formal acceptance of a validated project as a CDM project activity. Registration is the prerequisite for the verification, certification and issuance of CERs related to the project activity. Certification under the Kyoto Protocol is the written assurance that, during a specified time period, it has been verified that a project achieved the GHG emission reductions and removal enhancements. Only after the successful certification of the GHG emission reduction will the Executive Board issue the achieved credits [called CERs or, for reforestation and afforestation projects, temporary CERs (tCER) or long-term CERs (lCER)] to the project participants and subtract the share of proceeds. The share of proceeds (which consists of 2 % of the CERs) is to assist developing country parties that are particularly vulnerable to the effects of climate change. Projects in least developed countries are exempted from this share of proceeds. Furthermore, a registration fee has to be paid to cover administrative costs at the following rate [10]:

— USD 0,10 per CER issued for the first 15 000 tonnes of CO_2 equivalent for which issuance is requested in a given calendar year;

— USD 0,20 per CER issued for any amount in excess of 15 000 tonnes of CO_2 equivalent for which issuance is requested in a given calendar year.

A.3.2.1.3 Credits may only be achieved during the crediting period, which is the time period that includes GHG emission reductions and removal enhancements that are verified and certified. In the case of the CDM, the project participants select a period from the following alternative approaches:

— for emission reduction projects, see Reference [6], Annex p. 37, paragraph 49;

— for reforestation and afforestation projects, see Reference [7], Annex p. 21, paragraph 23.

A.3.2.1.4 In order to reduce CDM transactions costs, simplified modalities and procedures may be applied for small-scale projects:

— for emission reduction projects, see Reference [6], Decision p. 21, paragraph 6;

— for reforestation and afforestation projects, see Reference [7], Annex p. 16, paragraph 1i).

A.3.2.1.5 The adopted modalities and procedures for JI can be found in the annex of Reference [6]. JI project development, and host country approval, can vary depending on the country in which projects are implemented.

1) Clean Development Mechanism Executive Board information and decisions can be found at http://cdm.unfccc.int/EB.

To supervise JI, it was decided to establish a Supervisory Committee at the first Conference of Parties serving as Meeting of Parties.

A.3.2.2 Eligibility criteria

Specific eligibility requirements that have to be fulfilled by the project, the host party and investor party under the Kyoto regime are shown in Table A.1.

Table A.1 — Kyoto mechanism eligibility criteria

<table>
<tr><th rowspan="2">Aspect</th><th rowspan="2">JI</th><th colspan="3">CDM</th></tr>
<tr><th>Regular CDM</th><th>Small-scale CDM</th><th>Sinks project</th></tr>
<tr><td rowspan="10">Project</td><td></td><td></td><td>Meet small-scale definition.

(Reference [6], Decision p. 21, paragraph 6)</td><td>Only afforestation and reforestation project activities are eligible. Special treatment for small-scale CDM (Reference [7], Annex p. 4, paragraph 1i)</td></tr>
<tr><td colspan="4">Only emissions of greenhouse gases listed in Annex A of the Kyoto Protocol (Article 3 KP).</td></tr>
<tr><td>Written approval by the parties involved (Reference [5], Annex p. 14, paragraph 31b)</td><td colspan="3">Written approval of voluntary participation of project participants, including confirmation by the host party that the project activity assists it in achieving sustainable development (Reference [6], Annex p. 35, paragraph 40a)</td></tr>
<tr><td></td><td colspan="3">Public funding is not to result in the diversion of official development assistance (Reference [6], Decision p. 20)</td></tr>
<tr><td>Additionality</td><td>Additionality (Reference [6], Annex p. 34, paragraph 37d)</td><td>Additionality: Barriers or quantitative evidence</td><td>Additionality (Reference [7], Annex p. 18, paragraph 12d)</td></tr>
<tr><td colspan="2">Refrain from credits generated from nuclear facilities (JI: Reference [5], Decision p. 5/CDM: Reference [6], Decision p. 20)</td><td colspan="2">A systematic coincidence of verification and peaks in carbon stocks is avoided (Reference [7], Annex p. 18, paragraph 12e)</td></tr>
<tr><td>Projects starting as of the year 2000 may be eligible for crediting from 2008. (Reference [8], Draft Decision p. 6, paragraph 5)</td><td colspan="3">Projects starting in the period between 1 January 2000 and 18 November 2004 which have not yet requested registration but have either submitted a new methodology or have requested validation by a designated operational entity by 31 December 2005, can request retroactive credits if they are registered by the Executive Board by 31 December 2006 at the latest (Reference [10], paragraph 4).</td></tr>
<tr><td></td><td>Analyse environmental impacts. Undertake environmental impact assessment if required by the host party or project participants. (Reference [6], Annex p. 34, paragraph 37c)</td><td>Analyse environmental impacts if required by the host party</td><td>Analyse the socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems, and impacts outside the project boundary (Reference [7], Annex p. 18, paragraph 12c)</td></tr>
<tr><td></td><td colspan="3">Stakeholder comments and a report to the designated operational entity on how due account was taken of any comments received (JI: Reference [5], Annex p. 14, paragraph 32/CDM: Reference [6], p. 34, paragraph 37b)</td></tr>
</table>

Table A.1 — Kyoto mechanism eligibility criteria (*continued*)

Aspect	JI	CDM		
		Regular CDM	Small-scale CDM	Sinks project
Host party	See investor party requirements, whereas the party has as a minimum to fulfil the criteria a) - d) (second track). If it meets all criteria a) - g) it can use the so-called first track and can set up own rules for verification etc. (Reference [5], Annex p. 13, paragraph 24)	Has designated a national authority (Reference [5], Annex p. 11, paragraph 20a/CDM)		Select and report to the Executive Board which definition of "forest" was chosen: a single minimum tree crown cover; a single minimum land area value; or a single minimum tree height value (Reference [7], Annex p. 17, paragraph 8)
	Has ratified the Kyoto Protocol (JI: Reference [5], Annex p. 12, paragraph 21a/CDM: Reference [6], Annex p. 32, paragraph 31a)			
Investor party	Has designated a focal point (Reference [5], Annex p. 11, paragraph 20a)	Has designated a national authority (Reference [6], Annex p. 32, paragraph 30)		
	Has ratified the Kyoto Protocol (JI: Reference [5], Annex p. 12, paragraph 21a/CDM: Reference [6], Annex p. 32, paragraph 31a)			
	Has calculated its assigned amount pursuant to the rules (JI: Reference [5], Annex p. 12, paragraph 21b/CDM: Reference [6], Annex p. 32, paragraph 31b)			
	Has in place a national registry in accordance with the rules (JI: Reference [5], Annex p. 12, paragraph 21d/CDM: Reference [6], Annex p. 32, paragraph 31d)			
	Has in place a national system for estimation of emissions in accordance with the rules. (JI: Reference [5], Annex p. 12, paragraph 21c/CDM: Reference [6], Annex p. 32, paragraph 31c])			
	Has submitted annually the most recent required inventory in accordance with the rules. (JI: Reference [5], Annex p. 12, paragraph 21e/CDM: Reference [6], Annex p. 32, paragraph 31e)			
	Has submitted supplementary information on assigned amount in accordance with the rules. (JI:Reference [5], Annex p. 12, paragraph 21f/CDM: Reference [6], Annex p. 32, paragraph 31f)			
				There is a quantitative limit: For the first commitment period $\leqslant$ 5 times 1 % of the host country's base year emissions (Reference [6], Decision p. 22, paragraph 7b)

A.3.2.3 Clean Development Mechanism (CDM) project design document

The requirements of the GHG project plan in this part of ISO 14064 are similar to the contents of the project design document (PDD) as specified under the Kyoto Protocol's CDM. The requirements of the PDD can be found in Appendix B of Reference [6] and in Reference [9]. In addition to the elements of the GHG project plan, the PDD requires the following:

— an explanation as to how technology will be transferred, if any;

— information on public funding of the project activity, if any;

— information on the choice of the crediting period.

A.3.2.4 Product-related GHG projects

GHG projects may also be performed as a result of product development, where the GHG emission reductions or the GHG removal enhancements mainly occur in the use stage of the product life cycle (e.g. development of an air-conditioning system with lower energy requirements for a given cooling function than the baseline product). For product-related GHG projects, life cycle assessment (LCA) may be used to calculate GHG emission reductions or GHG removal enhancements[9].

A.3.3 Identifying GHG sources, sinks and reservoirs for the project

A.3.3.1 General

The project proponent is required to identify all relevant GHG sources and sinks controlled by the project proponent, as well as those related to or affected by the project. However, the quantification of GHG emissions and removals generally does not involve all of the potentially large number of GHG sources and sinks. Therefore, criteria to identify and select GHG sources and sinks relevant to, but not controlled by, the project proponent are necessary.

To ensure an appropriate comparison of the project and baseline (to calculate GHG emission reductions and removal enhancements), the services, products or function generally include a quantitative measure, and demonstrate functional equivalence.

The project proponent is also accountable for changes in GHG emissions and removals by GHG sources and sinks affected by the project through activity shifting or market transformation, often referred to as leakage. For example, a project that increases energy efficiency can also reduce energy prices and result in an increase in energy demand (i.e. “rebound effect”). Negative leakage refers to emission increases or removal decreases by GHG sources and sinks affected by the project, whereas positive leakage refers to GHG emission reductions or removal enhancements by GHG sources and sinks affected by the project.

Figure A.2 illustrates an example of a decision tree that provides a procedure to assist project proponents to consider GHG sources, sinks and reservoirs to fulfil, and document conformance with, some of the requirements of this part of ISO 14064. This framework might be used to identify and select GHG sources, sinks and reservoirs for estimation or for regular monitoring and quantification of GHG emissions and removals. The criteria used in the procedure by the project proponent should be consistent with the GHG project principles, good practice guidance, policies and rules of applicable GHG programmes, as well as other relevant sources. The project proponent should justify the choice of criteria used in the procedure, as well as the procedure being used (whether this example is used or another approach). For example, the criteria may consider a balance between practicality and cost-effectiveness with the GHG project principles. The project proponent should also consider good practice guidance for how to answer some of the decision criteria (e.g. when considering if a GHG source, sink or reservoir is related by flows into or out of the project or baseline scenario). In such cases, the project proponent might consider good practice guidance that provides established approaches related to the level of aggregation to represent sources, sinks and reservoirs (e.g. each boiler or the entire heating plant as the level of detail), the criteria used (e.g. mass fraction or material input, such as a co-solvent or catalyst represents more than 5 % of inputs on a mass basis) or percentage of costs (e.g. a product/output represents 10 % of project value and therefore should be considered). Ultimately, the decision whether or not to monitor or estimate a source, sink or reservoir directly might be based on the monitoring costs versus the market price of GHGs.

Exclusion of GHG sources from regular monitoring and quantification may also be justified when comparisons of the project and baseline sources show no change from the baseline to the project. In the case of GHG removal enhancement projects, a GHG source and/or sink may be excluded from regular monitoring and quantification requirements if the project proponent can demonstrate that the GHG source and/or sink is not a net source of GHG emissions over the project period.

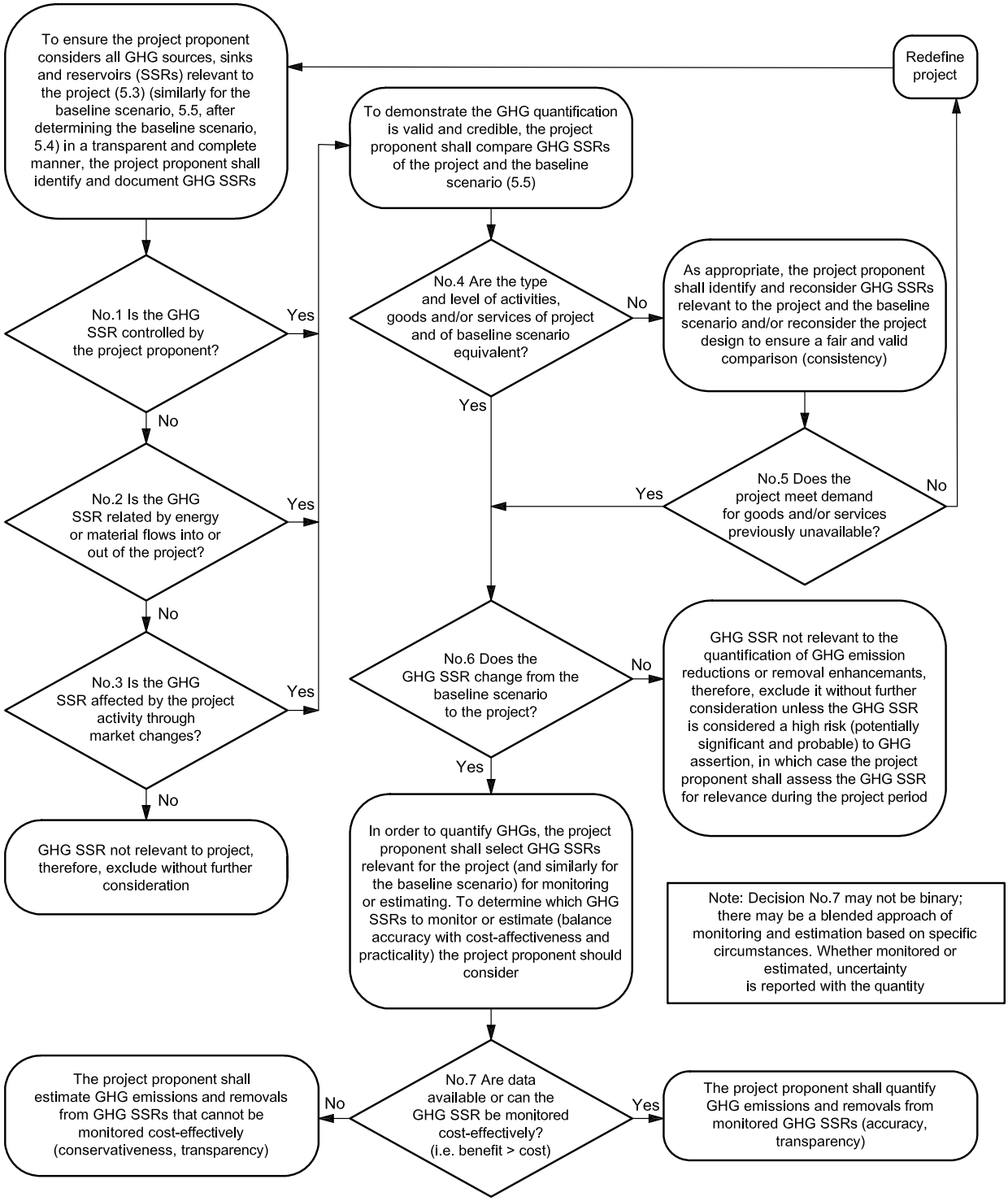


Figure A.2 — Identifying and selecting GHG sources, sinks and reservoirs

A.3.3.2 Kyoto mechanisms: Project boundaries

Unlike the Kyoto mechanisms and other programmes, this part of ISO 14064 does not use the terms “project boundary” or “leakage”. Instead, it refers to sources, sinks and reservoirs that are “relevant” to the project. Relevant sources, sinks and reservoirs include those that are “controlled” by the project proponent, those “related” to the project by material or energy flows, and those “affected” by the project. Affected and related sources represent those that in Kyoto terminology would cause “leakage”. The choice of terminology in these cases is intended to make this part of ISO 14064 neutral and compatible among a range of programmes by avoiding programme-specific definitions and requirements for “leakage” and for “boundaries”. A comparison of how these terms are used in this part of ISO 14064 and the Kyoto mechanisms is given in Table A.2.

Table A.2 — Comparison of terms

Relevant sources, sinks and reservoirs per ISO 14064-2	**Corresponding categories within the Kyoto Protocol** (Reference [6], Annex p. 37, paragraphs 51 and 52)
a) Controlled	— Directly attributable (inside project boundary)
b) Related to the project	— Directly attributable (inside project boundary)
	— Leakage (outside the project boundary) has to be taken into account if the emissions are attributable to the GHG project
c) Affected by the project	— Leakage (outside the project boundary) has to be taken into account if the emissions are attributable to the GHG project

A.3.4 Determining the baseline scenario

A.3.4.1 Selection of the baseline scenario

Baseline scenarios are always hypothetical scenarios for GHG emissions and removals that would have occurred in the absence of a proposed project. It is possible that the project may be the baseline scenario. Therefore, to ensure the project is not the baseline scenario, the project proponent is advised to consider the proposed project as a potential baseline scenario during project planning. If the project is the baseline scenario, there is a risk of no GHG emission reduction or removal enhancement, and the proposed project may not become a valid GHG project.

The predictive quality of quantifying many baseline scenarios, where there is the risk of over-estimating GHG emissions, requires a different approach. Consideration should be given to all feasible baseline scenarios for GHG emissions, and the selected scenario should be plausible over a range of assumptions for the duration of the baseline application. Usually a baseline methodology is used to select the baseline scenario. A conservative scenario is usually adopted among scenarios that are equivalent in terms of completeness, consistency, transparency and relevance. Baseline scenarios should cover the same period of time as the project.

As an example, terrestrial GHG removal projects are likely to use only selected GHGs in the assessment and determination of the baseline scenario. Only the sum of changes of carbon stocks in GHG reservoirs or carbon pools are likely to be considered. Additionality would also be assessed only against changes in GHG reservoirs or carbon pools. Resulting GHG removal enhancements would then be the sum of changes in carbon stocks in the GHG reservoirs or carbon pools less any increase in GHG emissions of all GHGs by GHG sources.

A.3.4.2 Baseline GHG emissions and removals estimation

Baseline procedures or methodologies to estimate baseline GHG emissions are generally customized (i.e. developed by the project proponent) or standardized (i.e. developed by the project proponent or programme authority for specific project types).

Historical conditions (such as GHG emissions or activity level data), market conditions (such as common technology usage), and best available technology (such as the top 20 % of similar activities) can also be the basis for the development of baseline methodologies. Baseline scenarios may be static (constant with time) or dynamic (vary over time).

GHG programmes may adopt simplified approaches related to baseline estimation for some GHG removal enhancement projects, such as adopting a zero baseline for afforestation and reforestation on certain land use types, where prior land-use is assumed to be in carbon balance and hence sequestration is zero. This would then constitute an appropriate standardized/performance baseline scenario for such projects.

A.3.4.3 Kyoto mechanisms: Baselines

Under the Kyoto regime, as part of the PDD, there are three baseline approaches that may be applied to the individual project activity and justified:

a) existing actual or historical GHG emissions, as applicable;

b) GHG emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment;

c) the average GHG emissions of similar project activities undertaken in the previous 5 years, in similar social, economic, environmental and technological circumstances, and whose performance is among the top 20 % of their category.

To ensure the project is additional, the project proponent has to describe how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered project.

More details on project baselines under the Kyoto mechanisms can be found in Reference [6], paragraphs 43 to 48 (Annex p. 36f). For afforestation and reforestation projects under the CDM, baseline information can be found under in Reference [7], paragraphs 19 to 22 [Annex p. 20[2)]].

A.3.5 Quantifying GHG emissions and/or removals

The first step in the quantification of GHG emissions and/or removals is identification of the relevant GHGs for each source, sink or reservoir. The nature of the information available to the project proponent determines whether GHG emissions or removals are estimated or quantified. For example, before the start of project initiation, in general, GHG emissions or removals are estimated, whereas during project operation, GHG emissions or removals can be directly monitored and measured to provide actual data for quantification.

Permanence is a criterion to assess whether GHG removals and emission capture and storage are long-term, considering the longevity of a GHG reservoir or carbon pool and the stability of its stocks, given the management and disturbance environment in which it occurs. How permanence is addressed in the Kyoto Protocol in the context of biological sinks can be found in Reference [7], under paragraphs 38 to 50.

Recalculation may occur at the end of the project period to ensure that the quantity of GHG emission reductions and removal enhancements are not over-estimated. Recalculation may also occur during the project period when the project proponent considers appropriate, for example, when better data become available. Recalculation should cover the entire project period since implementation commenced.

Additional good practice guidance with regard to land-use, land-use change and forestry (LULUCF) projects can be found in Reference [12], Chapter 4.3.

A.3.6 Managing data quality

Project data quality can be improved by

— establishing and maintaining a complete GHG information system,

— completing regular accuracy checks for technical errors,

— conducting periodic internal audits and technical reviews,

2) Baseline methodologies approved by the CDM's Executive Board can be found at http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html.

— appropriate training for project team members, and

— performing uncertainty assessments.

An uncertainty assessment can involve either a qualitative (e.g. high, medium, low) or quantitative procedure and typically is less rigorous than an uncertainty analysis, which is a statistically detailed quantitative and systematic procedure to ascertain and quantify uncertainty. Generally, an uncertainty assessment is appropriate during the planning phase of a project, and an uncertainty analysis during the implementation phase. It is up to programme proponents to decide and stipulate whether an uncertainty analysis is appropriate for implemented projects. For those using this part of ISO 14064 outside of a programme, an uncertainty analysis is recommended for implemented quantifications.

Good practice guidance with regard to quality assurance and quality control for LULUCF projects is included in Reference [12], Chapter 4.3.4.

A.3.7 Monitoring the GHG project

A.3.7.1 General

Monitoring procedures may include schedules, roles and responsibilities, equipment, resources, and methodologies to obtain, estimate, measure, calculate, compile and record GHG data and information for the project and baseline scenario.

A.3.7.2 Kyoto mechanisms: Monitoring

Monitoring of CDM projects under the Kyoto Protocol is regulated under the annex to decision 17/CP.7; details can be found in Reference [6], paragraphs 53 to 60 in Annex p. 38. Monitoring methodologies approved by the Executive Board can be found at http://cdm.unfccc.int/methodologies/approved. In the PDD, the monitoring plan is included in Reference [9] as Annex 4. For afforestation and reforestation projects under the CDM monitoring, information can be found in Reference [7], paragraphs 25 to 30 in Annex p. 21.

Good practice guidance with regard to monitoring for LULUCF projects is included in Reference [12] under Chapter 4.3.3.

A.3.8 Documenting the GHG project

This part of ISO 14064 refers to documenting in the context of internal needs linked to auditing and validation and/or verification. It is a complement to reporting that should serve external purposes.

Documentation is linked to the GHG information system and information system controls of the GHG project, as well as to the GHG data and information of the GHG project. Documentation should be complete and transparent.

A.3.9 Validation and/or verification of the GHG project

This part of ISO 14064 does not require validation or verification. Such requirements are usually elements of a GHG programme. If a GHG project has not been linked to a specific GHG programme, the project proponent has to decide on the type of validation and/or verification (1^{st}, 2^{nd} or 3^{rd} party verification) and the level of assurance (e.g. high or moderate) required against the GHG assertion. The GHG assertion is a statement on the performance of the GHG project usually made by the project proponent. ISO 14064-3 specifies principles and requirements for the validation and verification of GHG assertions.

A.3.10 Reporting the GHG project

A.3.10.1 General

Reporting keeps intended users informed about the GHG project. The content and form of the information reported should be tailored to the needs and expectations of the intended user. Project proponents may develop project-specific procedures for reporting depending upon the circumstances of the project, the objectives of reporting, the information needs of intended users, and the requirements of programmes in which a project participates. In all cases, reporting is based on GHG project documentation.

This part of ISO 14064 does not require the project proponent to make a GHG report available to the public unless a public GHG assertion or claim is made about the conformance of the GHG project to this part of ISO 14064. In such cases, minimum elements for GHG reports ensure completeness, accuracy and transparency in the public reporting of project information. The information released to the public should allow for fair comparison between various projects.

A high degree of transparency and opportunity for public comment can greatly increase the credibility of a project and is important for the market to assess the value of credits. Moreover, making project information public is necessary in order to obtain stakeholder comments for use in project development and management. Project proponents may also use public reports for publicity purposes.

A.3.10.2 Kyoto mechanism: Reporting

The PDD and the validation report have to be made publicly available from the operational entity (see Reference [6], Annex p. 36, paragraphs 40 b and g). Good practice guidance with regard to reporting of afforestation and reforestation projects is included in Reference [12], Table 4.2.6c on p. 4.48 of Chapter 4.

Annex B
(informative)

Greenhouse gas global warming potentials

Table B.1 provides various GWPs for a 100-year time horizon published by the Intergovernmental Panel on Climate Change (IPCC) in their 1996 reporting guidelines for national GHG inventories[11].

Table B.1

Gas	Chemical formula	IPCC 1996 Global warming potential
Carbon dioxide	CO_2	1
Methane	CH_4	21
Nitrous oxide	N_2O	310
Hydrofluorocarbons (HFCs)		
HFC-23	CHF_3	11 700
HFC-32	CH_2F_2	650
HFC-41	CH_3F	150
HFC-43-10mee	$C_5H_2F_{10}$	1 300
HFC-125	C_2HF_5	2 800
HFC-134	$C_2H_2F_4$ (CHF_2CHF_2)	1 000
HFC-134a	$C_2H_2F_4$ (CH_2FCF_3)	1 300
HFC-143	$C_2H_3F_3$ (CHF_2CH_2F)	300
HFC-143a	$C_2H_3F_3$ (CF_3CH_3)	3 800
HFC-152a	$C_2H_4F_2$ (CH_3CHF_2)	140
HFC-227ea	C_3HF_7	2 900
HFC-236fa	$C_3H_2F_6$	6 300
HFC-245ca	$C_3H_3F_5$	560
Hydrofluoroethers (HFEs)		
HFE-7100	$C_4F_9OCH_3$	500
HFE-7200	$C_4F_9OC_2H_5$	100
Perfluorocarbons (PFCs)		
Perfluoromethane (tetrafluoromethane)	CF_4	6 500
Perfluoroethane (hexafluoroethane)	C_2F_6	9 200
Perfluoropropane	C_3F_8	7 000
Perfluorobutane	C_4F_{10}	7 000
Perfluorocyclobutane	c-C_4F_8	8 700
Perfluoropentane	C_5F_{12}	7 500
Perfluorohexane	C_6F_{14}	7 400
Sulfur hexafluoride	SF_6	23 900

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