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1. General

This document is a summary of the decisions and interpretations made in the course of individual product trainings or calibrations regarding the elements of ISO 14064-1 and -2:2019 as well as ISO 14067 and the **quality**austria procedure. It is intended to provide support for the auditors (validators, verifiers and experts) of Quality Austria.

The following aspects are particularly addressed:

- Determination of the scope by the organization (applicant) – Information on making offers (feasibility check)
- Assistance for the assessment of the GHG Statement

Furthermore, this Guide provides a summary of practical experiences with regard to influencing factors and practical tips from inspections and environmental audits.

Aim and purpose of ISO 14064-1 and -2:2019

- Clarifies the **principles and requirements** for the planning, development, management and reporting of **greenhouse gas inventories at organizational level** or **project level.**
- It includes **requirements for determining** the boundaries of GHG emissions and removals, and **quantifying** the greenhouse gas emissions and removals of an organization or project.
- **Identification of specific actions or activities** of the company that are aimed at **improving the GHG management**.
- It also includes **requirements for and guidance on quality management** of GHG inventories, reporting, conducting audits and an organization's responsibilities related to verification activities.

The collection of decisions only addresses key points (critical standard requirements, broad scope of interpretation, need for clarification etc.). The **quality**austria checklist covers the mandatory (MUST) requirements.

Aim and purpose of ISO 14067:2018

Defines the principles, requirements and guidelines for the quantification of the **carbon footprint of products**. The aim is to quantify GHG emissions associated with the life cycle stages of a product, beginning with resource extraction and raw material sourcing and extending through the production, use and end-of-life stages of the product.

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1. 总则

本文件为质量奥地利（Quality Austria）根据 ISO 14064-1 和 -2:2019 以及 ISO 14067 标准内容，在内部产品培训或校准过程中所做的决策与解释摘要，旨在为 Quality Austria 的审核员（验证员、核查员及专家）提供支持。

重点涉及以下内容：

- 由组织（申请方）确定的适用范围 —— 提供报价时的可行性评估信息
- 温室气体声明评估的实务辅助

此外，本指南还总结了来自检查与环境审核实践中的影响因素和实用建议。

ISO 14064-1 和 -2:2019 的目的与目标

- 明确组织层面或项目层面温室气体清单的规划、开发、管理和报告的原则与要求。
- 包含温室气体排放与清除边界的界定要求，以及组织或项目层面的排放与清除量化方法。
- 识别企业为改善温室气体管理所采取的特定行动或活动。
- 提出有关温室气体清单质量管理、报告、审核实施及组织在验证活动中所承担职责的要求与指导。

本决策汇编仅涵盖关键点（如标准要求关键条款、解释范围较广、存在澄清必要等）。Quality Austria 的核查清单涵盖了所有必须满足的要求（MUST）。

ISO 14067:2018 的目的与目标

该标准定义了产品碳足迹量化的原则、要求与指南。其目标是量化产品生命周期各阶段的温室气体排放，包括从资源开采和原材料采购、生产、使用到产品生命周期结束的各阶段。

2. The Verification and Validation Procedure

This procedure is divided into the following steps:

1. Feasibility check (Pre-engagement)
2. Engagement
3. Planning
4. Verification / Validation Execution
5. Review
6. Decision and issue of the validation / verification statement
7. Handling of appeals
8. Handling of complaints
9. Records

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2.1.1 Results of Verification and Validation

There are three documents maintained as documented information per method:

- **Report** FO_27_01_206e_Verification/Validation report_14064-1 incl. possible action protocol and FO_27_01_226e_Verification/Validation report_ISO 14067
- **Opinion** FO_27_01_207e_Opinion_14064-1 for the intended user and FO_27_01_227e_Opinion_ISO 14067
- **Test certificate** FO_27_01_208e_Test certificate GHG Verification_Validation for ISO 14064 and FO_27_01_225e_Test certificate GHG Verification_Validation for ISO 14067

The following figures show the verification and validation process; the source is respectively ÖNORM EN ISO 14065-3, Figure 3, Page 13 and Figure 4, Page 14.

2. 核查与验证程序

本程序包括以下步骤：

1. 可行性评估（前期接洽）
2. 正式接洽
3. 审核计划制定
4. 核查 / 验证执行
5. 审核报告与评审
6. 做出验证 / 核查结论并签发声明
7. 申诉处理
8. 投诉处理
9. 记录归档

2.1.1 核查与验证结果

依据不同的方法，有三类文件需作为记录信息保存：

- **报告**
  - FO_27_01_206e_核查/验证报告_14064-1（含必要时的行动协议）
  - FO_27_01_226e_核查/验证报告_ISO 14067
- **意见书**
  - FO_27_01_207e_意见书_14064-1（面向最终使用者）
  - FO_27_01_227e_意见书_ISO 14067
- **验证证书**
  - FO_27_01_208e_温室气体核查验证证书_ISO 14064
  - FO_27_01_225e_温室气体核查验证证书_ISO 14067

  接下来的图示说明核查与验证的流程，来源为 ÖNORM EN ISO 14065-3 第 13–14 页中的图 3 和图 4。

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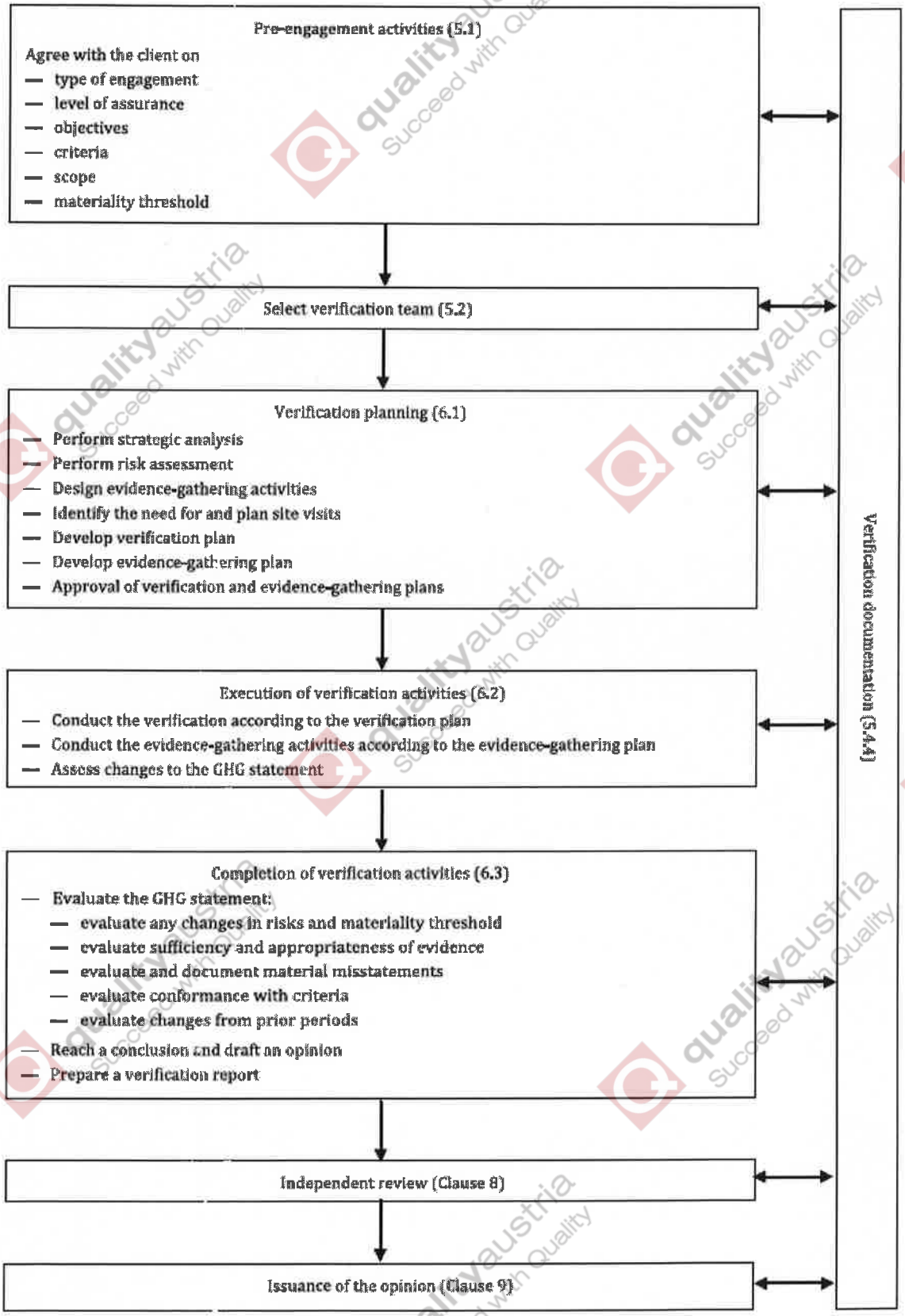

Figure 3 — Verification process

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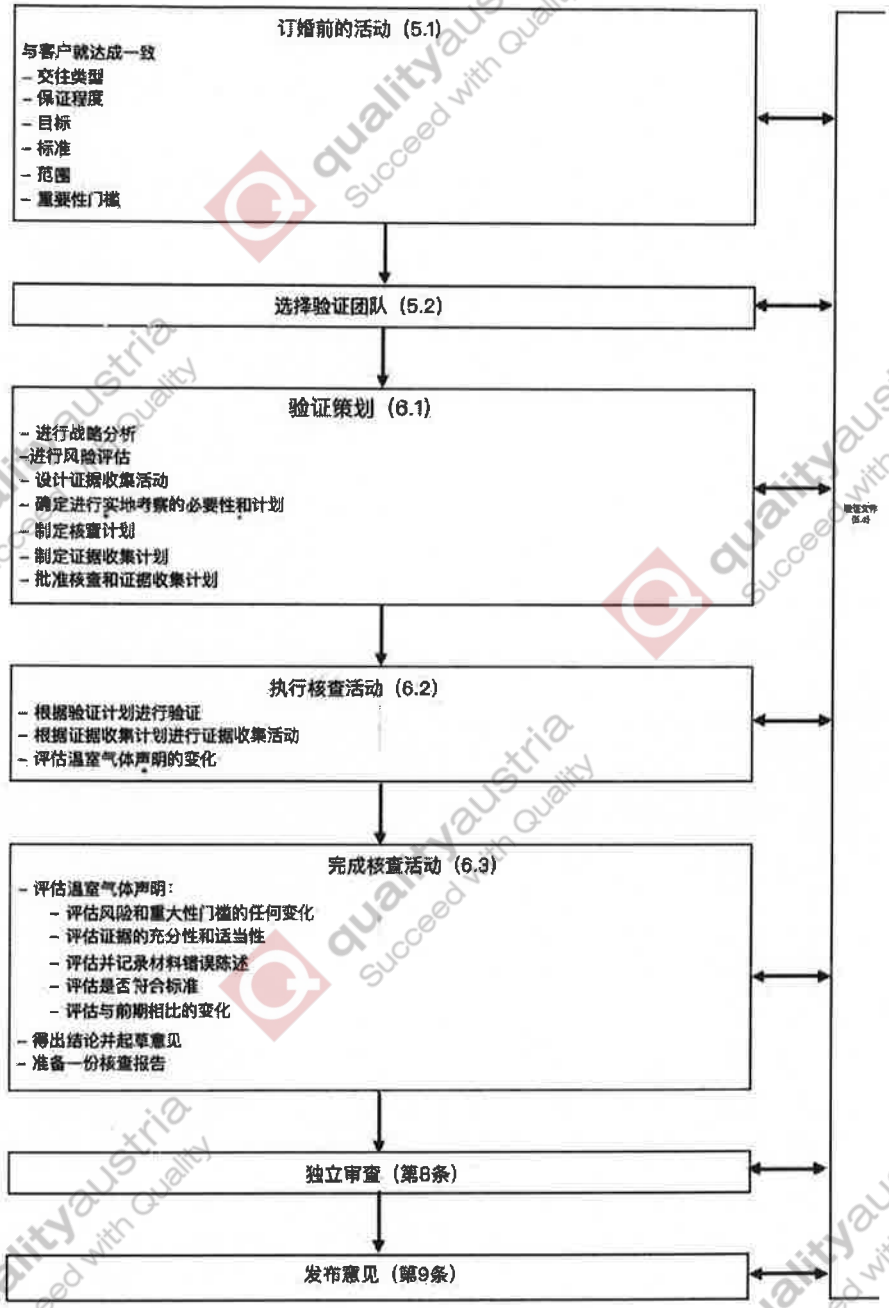

图3 – 验证流程

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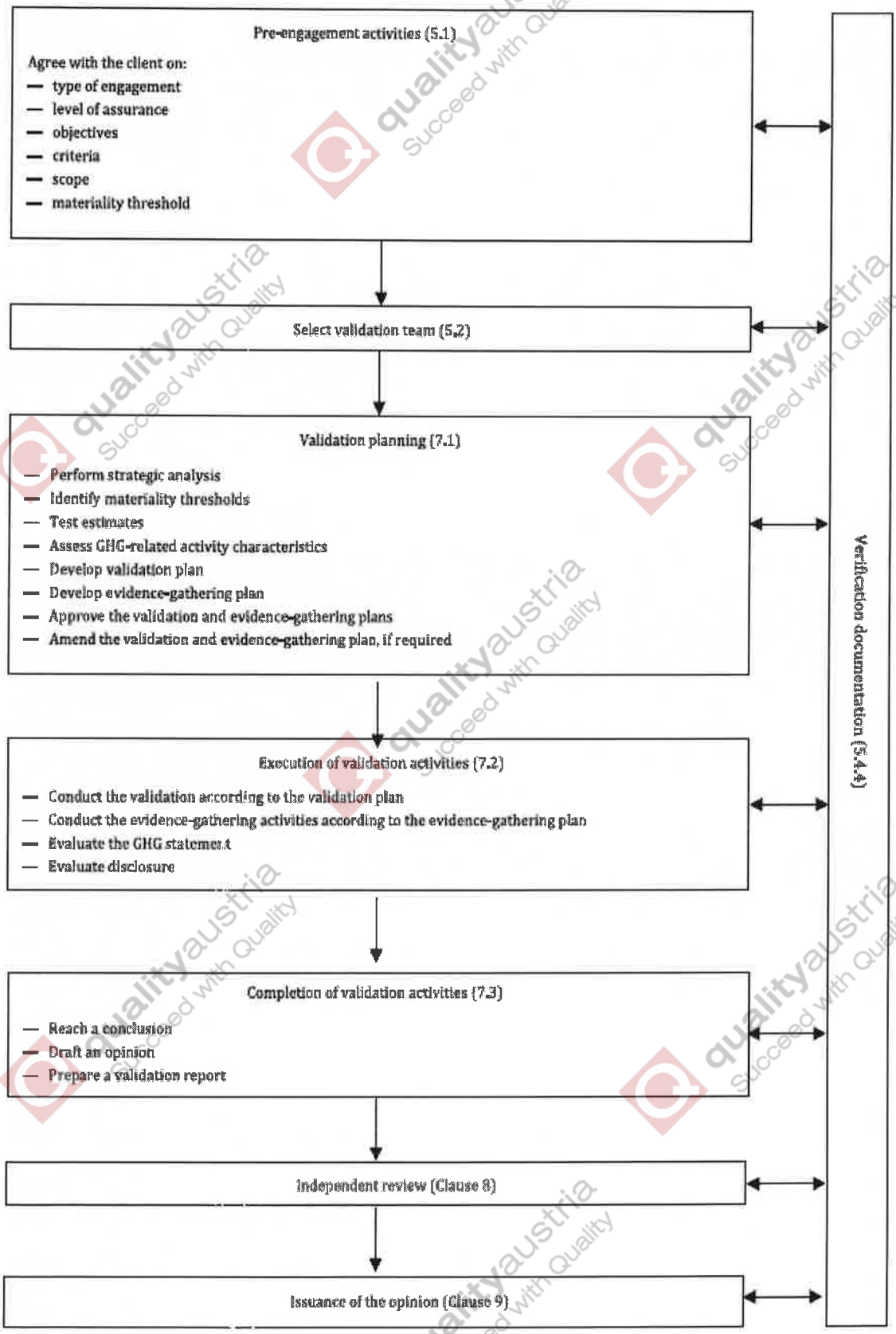

Figure 4 — Validation process

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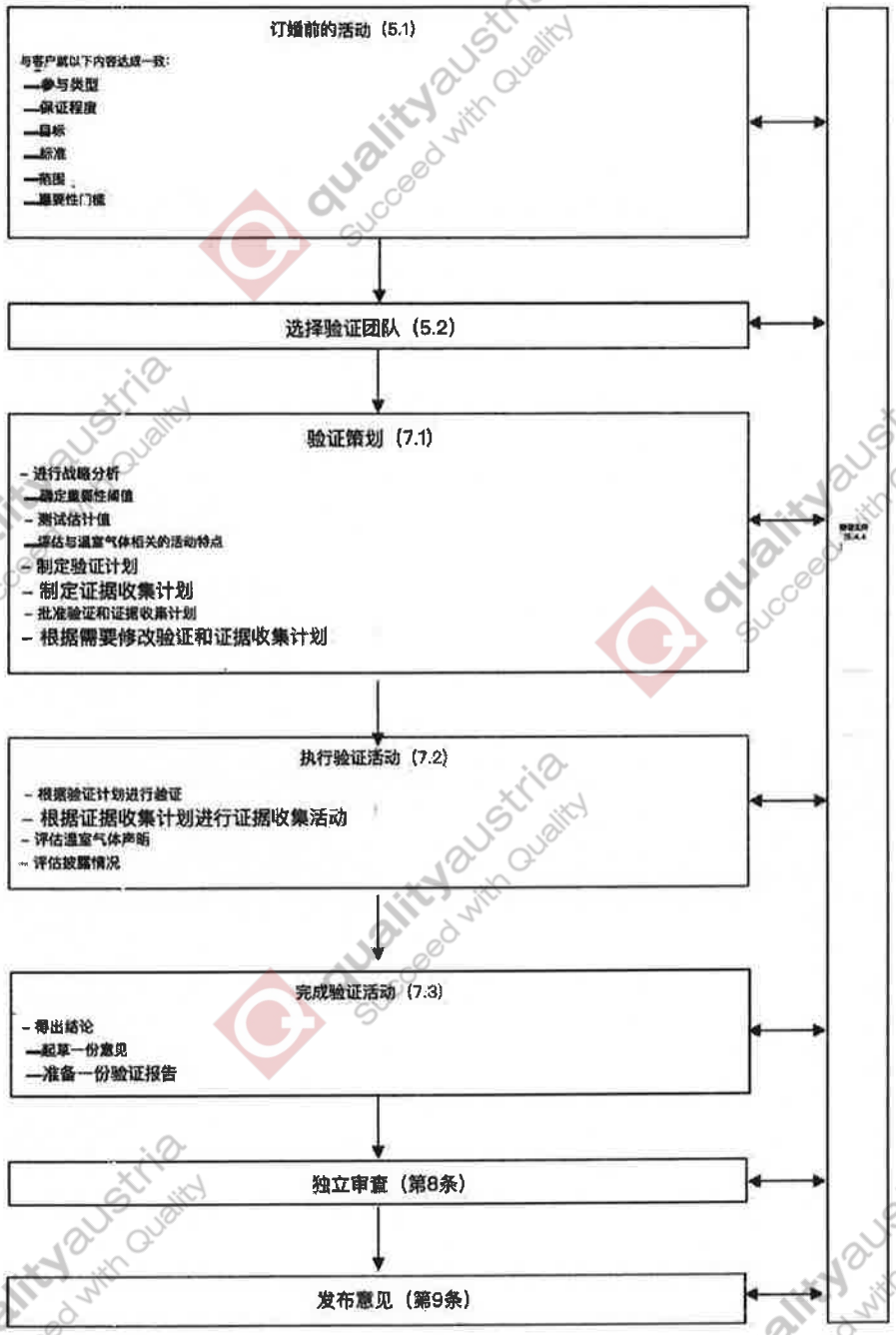

图4 – 验证过程

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Information on Making Offers

Perform a feasibility check according to the document FO_25_03_27e_Information on making offers_ISO 14064-1 and ISO 14064-2 and ISO 14067.

The certification body reviews this information for completeness, comprehensibility and plausibility (pre-engagement). The result of the pre-engagement is as follows:

- Determination of feasibility
  - No: Rejection of validation / verification → Information to the client
  - Yes: Preparation of the engagement
- Timing of the validation or verification activity as a basis of engagement
- Determination of materiality
- Definition of the level of assurance
- List of possible questions for the first site visit (risks)

Decision Guidance for the Level of Assurance:

- A **reasonable level of assurance** verification shall be conducted:
  - if Scope 3 accounts for > 40 % (oriented to SBTi) > 50 % of the indirect GHG (Scope 3) must be evidenced by CCF and/or PCF information;
  - if Scope 3 accounts for < 40 %, the amount of generic data must be < 20 %;
  - if Scope 1 and 2 data are > 80 % measured and the quality of the measurement is appropriate, a high degree of certainty can be confirmed;
  - sufficient quality in the procedures and competence in the team;
  - legal risks could not be identified at the time of the verification / validation;

If climate neutrality is issued as a claim, this can only be achieved with internal performance (see also chapter 0)

报价信息

根据文件 **FO_25_03_27e_信息提供 – ISO 14064-1、ISO 14064-2 和 ISO 14067 报价信息**，执行可行性评估。

认证机构会审查该信息是否**完整、易于理解且具有可行性**（即：前期接洽）。前期接洽的结果如下：

- 可行性判断
  - 若结果为否：拒绝验证/核查 → 向客户发出通知
  - 若结果为是：准备签署接洽协议
- 验证或核查活动的时间安排作为签约基础
- 重大性（Materiality）的判定
- 明确保证程度（Level of Assurance）

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- 首次现场访问的可能问题清单（风险）

关于"保证程度"的决策指导

进行"**合理保证级别（Reasonable Level of Assurance）**"的核查需满足以下情况：

- 若**范围 3（Scope 3）排放占比超过 40%（参照 SBTi），则至少 50% 的间接温室气体（Scope 3）排放**必须通过**企业碳足迹（CCF）和/或产品碳足迹（PCF）信息**加以佐证；
- 若范围 3 排放占比低于 40%，则**通用数据的比例必须低于 20%**；
- 若**范围 1 和 2 的数据中有 80%以上为实测数据**，且**测量质量适当**，可确认较高程度的确定性；
- 组织的**流程质量足够**且**团队具有相应能力**；
- 在核查/验证时**未发现法律风险**；
-

若企业声称**实现气候中和（Climate Neutrality）**，该声明**只能通过组织的内部绩效达成**（参见第 0 章）。

Planning and Preparation – Verification / Validation Stage 1

Verification and validation can be an **iterative process**.

规划与准备——验证 / 确认第一阶段

验证与确认可以是一个反复迭代的过程。

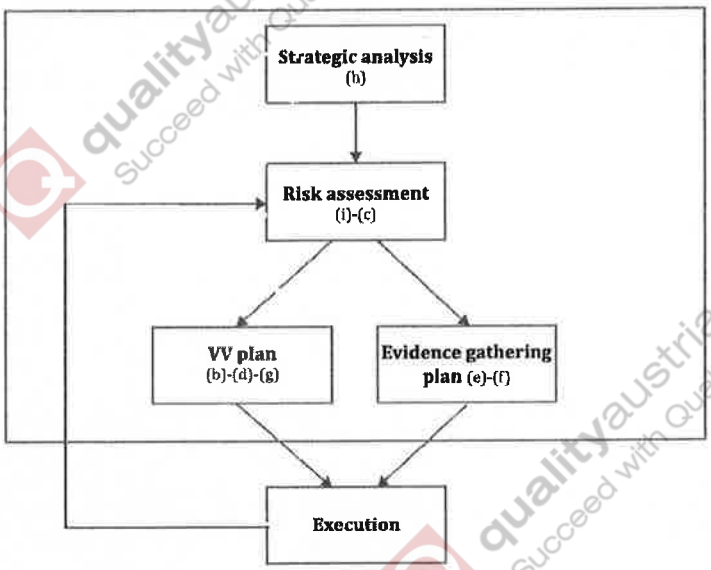

Figure 1 — Steps of a planning process

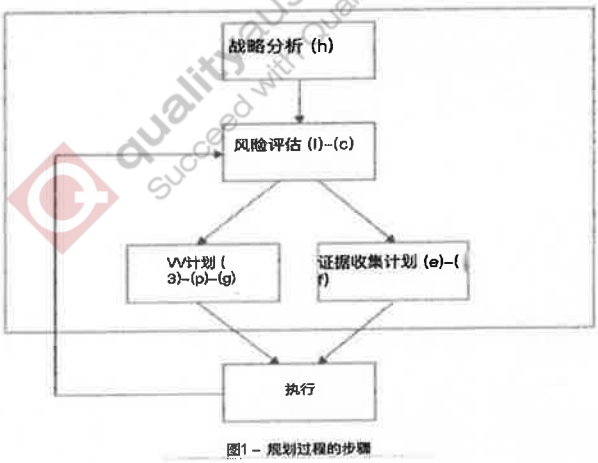

图1 – 规划过程的步骤

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Figure: Steps of a planning process, Source: ISO 14065:2022, Page 13

图示：规划流程的步骤，来源：ISO 14065:2022，第 13 页

In a **first stage of validation / verification** (if possible, on site) the planning and preparation are discussed in detail with the client:

- **Strategic analysis**
  - review of information from the **feasibility data sheet**;
  - inventory **objectives**;
  - clarification of **inventory boundaries** (ownership regarding CO_2 emissions, locations, site boundaries, scope of inventory, scope of a CFP (carbon footprint of products) study (e.g. partial CFP));
  - **materiality threshold**: may still need to be defined with the client organization (see chapter 8 of RE_27_01_130e_Program_Guide Verification and Validation GHG);
  - **responsibilities** at the client organization (key personnel, competences, tasks);
  - **declaration** / statement;
  - review of the **GHG report** or previous V-reports;
  - GHG relevant **processes** (activities, operations);
  - relevant **sector** information;
  - **overview of facilities**;
  - potential relevant legal basics including climate protection obligations;
  - **energy and material flows** (Sankey charts including sources, sinks and possible reservoirs);
  - types of **sources of information and data** incl. potential estimate methodology;
  - review of the data collection process (measurement, monitoring, evaluation, periods) and potential statements on the accuracy of data;
  - determination of emission factors including references;
  - *Validation:*
    - What **requirements** does the intended **user** of the validation report specify?
    - Is a proper disclosure of the GHG statement available?
    - What are the results of the sensitivity and uncertainty analysis?
    - Appropriateness and quality of the estimate methodology

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- Could **possible side effects or shifts** of emissions occur? If the GHG-related activity has to consider side effects, the validation has to assess the completeness and accuracy of these modifications.
- **Functional equivalence**: the validator shall assess whether the project and the baseline scenario are functionally equivalent.
- **Sensitivity**: The validator shall identify **assumptions with high potential for change** and assess whether these **changes** are material to the GHG statement.

- **Site visit** (material facilities, storages)

- **Risk analysis and risk assessment**:
  - complexity of the organization/project/product;
  - clear specifications in the organization/project/product;
  - recognition of potential misstatements;
  - Are all SSRs identified? To what extent is the data complete and accurate?
  - clarification of possible influencing factors that could affect the outcome;
    - materiality threshold;
    - exclusions;
    - identification of possible uncertainties and their relative effect on the GHG statement;
    - calibration of measuring equipment;
    - type and frequency of data collection, e.g. automated data collection vs. point-by-point manual data collection;
    - level of detail of available information: measurement concept at different levels (main meter, sub-meter, or mobile meter?);
    - data monitoring: continuous measurement or punctual / time-limited measurements;
    - evaluation of data incl. calculations, conversions and use of suitable databases or emissions factory;
    - potential risks and inaccuracies in the data management process;
    - especially in validation: estimate methodology (appropriateness, applicability of assumptions, quality of estimates and data on which they are based; calculations or models based on them, forecasts). The verifier shall develop his/her own point estimate or range of

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estimates to assess the assumptions of the responsible party (client organization, client);

- identification of potential nonconformities;
- Do any significant or unusual emissions exist outside of operations?
- Are there legal risks?
- Is an improvement process incl. root cause analysis, corrections, and corrective actions established?
- type of quality assurance in the inventory;

在验证/核查的第一阶段（如有可能，应在现场进行），将与客户详细讨论以下规划和准备内容：

- 战略分析
- 对可行性数据表中信息的审查；
- 盘查目标；
- 盘查边界的澄清（关于 CO_2 排放的所有权、地点、场所边界、盘查范围、产品碳足迹（CFP）研究的范围，例如：部分 CFP）；
- 重要性阈值：可能仍需与客户组织共同确定（参见文件 RE_27_01_130e《温室气体验证与核查计划指南》第 8 章）；
- 客户组织内部的职责分配（关键人员、能力、任务）；
- 声明 / 主张文件；
- 对温室气体报告或以往验证报告的审查；
- 与温室气体相关的流程（活动、操作）；
- 相关行业信息；
- 场所概况；
- 潜在的相关法律依据，包括气候保护义务；
- 能源和物质流动（桑基图，包括来源、汇和可能的储存池）；
- 信息与数据来源类型，包括潜在估算方法；
- 对数据收集过程的审查（测量、监测、评估、时间段），以及有关数据准确性的潜在声明；
- 排放因子的确定及其来源说明；

关于验证：

- 验证报告的预期使用者有哪些具体要求？
- 是否具备适当披露的温室气体声明？
- 敏感性与不确定性分析的结果如何？
- 估算方法的适用性与质量；
- 是否存在可能的副作用或排放转移？如温室气体相关活动必须考虑副作用，则验证过程需评估这些修改的完整性和准确性；
- 功能等同性：验证员需评估项目方案与基线情景是否在功能上等效；
- 敏感性：验证员需识别具有高变动潜力的假设，并评估这些变化是否对温室气体声明具有实质影响；
- 现场访问（重要的场所、仓储地点）；

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风险分析与评估：

- 组织/项目/产品的复杂性；
- 项目/组织中是否有明确的规范；
- 潜在误报的识别；
- 是否识别了所有的数据收集与报告系统（SSRs）？数据是否完整准确？
- 澄清可能影响结果的因素；
- 重要性阈值；
- 排除项；
- 潜在不确定性的识别及其对温室气体声明的相对影响；
- 测量设备的校准；
- 数据收集的类型与频率，例如自动收集 vs. 按点人工收集；
- 可用信息的详细程度：不同层级的测量概念（主表计、分表计或移动表计？）；
- 数据监测：连续测量还是定期 / 有限期的测量？
- 数据的评估，包括计算、换算以及使用的数据库或排放因子；
- 数据管理过程中可能存在的风险与误差；
- 特别是在验证中：估算方法（适用性、假设的合理性、估算和所依据的数据质量；所用模型或计算是否合适，是否含有前瞻性内容）。验证员应制定自己的点估计或估计范围，以评估委托方（客户组织）提出的假设；
- 潜在不符合项的识别；
- 是否存在运行之外的重大或异常排放？
- 是否存在法律风险？
- 是否建立了改进流程，包括根本原因分析、修正与纠正措施？
- 清单中的质量保证措施类型。

2.1.2 Additional Requirements for Project GHG Statement Verification

The **strategic analysis** (cf. ISO 14064-3 6.1.1.2) shall consider the following:

- the project plan;
- the results of the validation report;
- the requirements of the monitoring plan;
- the applied monitoring methodology;
- the monitoring report.

The **risk assessment** (cf. ISO 14064-3 6.1.2.5) shall consider the following:

- whether the current operating conditions reflect assumptions, limitations, methods and uncertainties in the project plan or criteria;
- the complexity and data availability of the baseline calculations;
- a comparison of actual versus expected emission reductions or removal enhancements;

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2.1.2 项目温室气体声明验证的附加要求

战略分析（参考 ISO 14064-3 第 6.1.1.2 节）应考虑以下方面：

- 项目计划；
- 验证报告的结果；
- 监测计划的要求；
- 所采用的监测方法；
- 监测报告。

风险评估（参考 ISO 14064-3 第 6.1.2.5 节）应考虑以下方面：

- 当前运行条件是否反映项目计划或标准中的假设、限制、方法和不确定性；
- 基准线计算的复杂性与数据可用性；
- 实际与预期的减排量或碳移除增量的比较。

2.1.3 Result of Planning and Preparation

- confirmation of the **engagement type(s)** (validation / verification / combination);
- common understanding of the **declaration / statement**;
- confirmation of **scope / inventory boundaries**;
- confirmation of the **timing** of verification / validation activities; timing may be subject to change;
- documentation of misstatements, exclusions, inaccurate representations, and uncertainties as inputs for determining the **level of assurance**;
- **V-planning:** inputs for planning the validation or verification are included in the **V-plan**. **Contact persons** are assigned;
- **Evidence-gathering plan**: planning and definition of essential specific **evidence documents**;
- possible open points (possible nonconformities) concerning the implementation in compliance with the standard shall be communicated to the client;

- **Approval of validation**: The validators shall determine whether the **intended user** recognizes the GHG-related activity. In assessing recognition, the validator shall:
  - determine whether the GHG-related activity is **acceptable to the intended user**, including whether the GHG-related activity meets any **eligibility criteria specified** by the intended user;
  - assess whether **there are geographic or temporal restrictions specified** by the intended user and whether the GHG-related activ-

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ity complies with these restrictions;

- assess whether the GHG-related activity is **real, quantifiable, verifiable, permanent and enforceable**;
- after the confirmation of the calculations used in the GHG statement, re-assess whether the GHG-related activity will still be recognized.

The **report draft** may already include the following:

- declaration / statement;
- scope, inventory boundaries and objectives;
- documentation of uncertainties;

Furthermore, a **verification or validation plan (short V-plan)** is prepared and submitted to the client at least two weeks before the scheduled date.

Verification and Validation Execution Stage 2

Use the respective **current checklist**: Organization:

CL_27_01_182e_ISO 14064-1

Project: CL_27_01_184e_ISO 14064-2

Product: CL_27_01_189e_ISO 14067

When conducting the verification or validation the focus is on:

- Collection of **objective evidence** by reviewing documented information (controlled specifications, records), interviews, and company inspection tours etc.
- During the collection of evidence, attention should be paid to **traceability** from measurements, calculations, **referencing** of source data etc.
- Identification and documentation of possible **inaccurate data or uncertainties**;

The validation / verification can also be an **iterative process** in its execution.

A **site or facility visit must be planned and performed** under any of the following circumstances:

- an **initial verification**;
- a subsequent verification for which the verifier does not have knowledge of the prior verification activities and results, for example as a consequence of a personnel change;
- where there has been a **change of ownership** of a site or facility;
- when **misstatements** are identified;

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- there are **unexplained material changes in emissions**, removals and storage since the previous verified GHG statement;
- the **addition of a site or facility** of GHG SSRs that are material to the GHG statement;
- material changes in **scope** or boundary of reporting;
- significant changes in the **data management**;

If a verifier determines that the site or facility visit is not necessary, the verifier shall **justify and document the rationale for the decision**.

2.1.3 规划与准备的结果

- 确认参与类型（验证 / 核查 / 组合）；
- 对声明/陈述达成共识；
- 确认范围 / 盘查边界；
- 确认验证/核查活动的时间安排（时间安排可能发生变化）；
- 对错报、排除项、不准确表达和不确定性的记录，作为确定保障等级的输入；
- 核查计划（V-plan）：用于验证/核查的计划输入已纳入 V-plan 中，明确了联络人；
- 证据收集计划：规划和界定关键证据文件；
- 如果存在潜在的不符合项，关于标准要求的执行，应及时通知客户；

验证批准：验证员应确定预期使用者是否认可与温室气体相关的活动。在评估认可情况时，验证员应：

- 确认该温室气体相关活动是否被预期使用者接受，包括是否符合其规定的合格性标准；
- 评估预期使用者是否规定了地理或时间限制，以及活动是否符合这些限制；
- 评估温室气体相关活动是否真实、可量化、可验证、具有持久性且可强制执行；
- 在确认温室气体声明中使用的计算后，重新评估该活动是否仍被认可。

报告草稿中可包含以下内容：

- 声明 / 陈述；
- 范围、盘查边界与目标；
- 不确定性的记录。

此外，应至少在计划日期前两周向客户提交验证/核查计划（简称 V-plan）。

验证与核查执行阶段（二阶段）

请使用当前适用的核查清单：

- 组织：CL_27_01_182e_ISO 14064-1
- 项目：CL_27_01_184e_ISO 14064-2
- 产品：CL_27_01_189e_ISO 14067

在执行验证或核查时，应重点关注：

- 通过审查文件资料（受控规范、记录）、访谈及现场巡视等方式收集客观证据；

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- 在收集证据过程中，需特别注意从测量、计算到数据来源引用的可追溯性；
- 识别并记录可能存在的不准确数据或不确定性；

验证 / 核查在执行过程中也可以是迭代的。

在以下情况下，必须计划并执行现场或设施访问：

- 初次验证；
- 上一次验证活动及结果不为当前验证员所知，例如因人员更替；
- 设施或场所所有权发生变更；
- 发现错报；
- 与之前核查声明相比，排放、移除或储存量出现重大变化且无法解释；
- GHG 系统边界中新增了对核查声明具有重大影响的设施；
- 报告范围或边界发生重大变化；
- 数据管理发生重大变动；

如果验证员认为无需进行现场访问，必须为该决定提供合理解释并予以记录。

2.1.4 Possible Changes in the Planning or the Procedure

Possible reasons for amendments to the verification / validation planning may include:

- changes in the **scope** (e.g. sites);
- changes in the **availability of client / responsible party contact** (e.g. due to illness);
- changes in the **access to the location** (e.g. no on-site visits possible due to pandemic);
- changes in the time schedule;
- changes in **evidence-gathering procedures** (e.g. data must be recalculated, new data must be collected);
- changes in **sources of information**;
- identification of **new risks**;
- identification of **misstatements**;
- identification of **nonconformities** in relation to ISO 14064-1, -2 or ISO 14067

2.1.4 计划或程序中的可能变更

对核查/验证计划进行修改的可能原因包括：

- 范围发生变化（例如新增或删除场所）；
- 客户/责任方联系人可用性发生变化（例如因病无法参与）；
- 场地访问条件发生变化（例如因疫情无法进行现场访问）；
- 时间安排发生变化；

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- 取证程序发生变化（例如需重新计算数据，或需收集新数据）；
- 信息来源发生变化；
- 发现新的风险；
- 发现陈述错误；
- 发现与 ISO 14064-1、14064-2 或 ISO 14067 有关的不符合项。

3. Fulfilling the Requirements 满足要求

Guidance for the Assessment (ISO 14064-1) ISO 14064-1 的评估指南

Clause 条款	Contents 内容	Guidance for the Assessment 评估指南
3.2.5	GHG Statement 温室气体声明	**Usually, the temporal reference** (for GHG statement or reference base) is **one** calendar year XY If a **period** of several years is selected as the temporal reference, the following would have to be taken into account for **reasons of relevance**: **In case of verification:** **The reason for choosing a period of time** must **not be the absolute deterioration in a current year** → then one has made a better result with „time period instead of point in time"! **Question the reason for the procedure!** **In case of validation:** The choice of a period of time – for GHG statement or reference basis – **would be understood as a legitimate "choice of mean value" and would serve the conservative approach.** 通常，GHG（温室气体）声明或参考基准的时间范围为一个日历年。如果选择多年的时间段作为参考，应考虑其相关性： **核查时**：选择多年的时间段不能是为了掩盖当前年度的劣化情况，否则会出现"以时间段代替时间点"使结果更优的倾向——应质疑此做法的理由。 **验证时**：若选择一段时间作为 GHG 声明或参考基准，则可视为

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4. Principles 原则		Was it possible to review all information? For example: Someone in the supply chain claims a„carbon neutral (pre-)product" → calculated with zero in the inventory. This can be true, but it does not have to be true... The basic requirement should be that the **GHG statement (the GHG report) of this supplier can be reviewed or that this GHG statement has already been verified**. → If this is not the case - it is not proven with sufficient certainty. **是否能够审核所有信息？例如：供应链中某人声称某"碳中和的（预）产品"在清单中按零排放计入——这可能属实，也可能不属实。基本要求应为：该供应商的 GHG 声明（报告）应可供审查或已通过验证。若无法确认，则无法证明其具备充分的确定性。**

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Clause	Contents	Guidance for the Assessment
5.2 Reporting boundaries 报告边界	Quantification of GHG emissions in CO_2 equivalents 以 CO2 当量计的 GHG 排放量量化	Confidential source for GWP: - IPCC AR6 (on page 1842): https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf) - List of the UBA Deutschland (German Federal Environmental Agency) (based on the IPCC AR4/AR5) (https://www.umweltbundesamt.de/sites/default/files/medien/10597/dokumente/treibhauspotentiale_gwp_ausgewaehlter_verbindungen_und_deren_gemische.pdf) - UBA Österreich (Austrian Federal Environmental Agency) used for the Inventory 2021: https://unfccc.int/process-and-meetings/transparency-and-reporting/greenhouse-gas-data/frequently-asked-questions/global-warming-potentials-ipcc-fourth-assessment-report ➔ In principle, the **same IPPC source should be used** for the explanation for consistency reasons. (However, deviations are mostly small or sometimes play a subordinate role in comparison to other uncertainties!) For example: UBA_AT impact factors for electricity are used, which are currently calculated with IPCC AR4; for 2023 (inventory 1990 – 2021) they are probably calculated with AR5 (AR6 not yet included) and then in a database there are other impact factors from a possibly more current IPCC version. Note: the accuracy gain of the use of a country-specific current emission factors for electricity is usually to be classified as greater than the most current or consistent GWP factors with simultaneous use of generic electricity factors from databases! → **Hint, except in case of deterioration of impact factors and weak justification why the latest version was not used.** ➔ IPCC Assessment Report / Overview: - 2007: Fourth Assessment Report of IPCC (AR4) - 2013/2014: Fifth Assessment Report of IPCC (AR5) - 2021/2022: Sixth Assessment Report of IPCC (AR6) **GWP（全球变暖潜能值）数据来源（保密但常用）包括：** • IPCC 第六次评估报告（AR6）第 1842 页：PDF 链接 • 德国联邦环境署（UBA Deutschland）依据 IPCC AR4/AR5 编制的列表：PDF 链接 • 奥地利联邦环境署（UBA Österreich）用于 2021 年清单的版本：UNFCCC 链接 **为确保一致性，原则上应使用相同的 IPCC 数据源。** 尽管不同版本之间的偏差通常较小，有时在总体不确定性中占比较低。例如 UBA_AT 提供的电力影响因子目前基于 AR4，但 2023 年版本（用于 1990–2021 年清单）可能会基于 AR5（AR6 尚未纳入）。数据库中可能也包含来自更新版本的因子。 **注意：** 使用国家特定的当前电力排放因子所带来的准确性提升，通常大于使用最新或统一 GWP 因子的优势，尤其是当后者是通用数据库数据时。除非有显著的影响因子偏差且未合理说明为何未采用最新版本，否则建议使用本国数据。 **IPCC 报告时间节点：** • 2007 年：第四次评估报告（AR4） • 2013/2014 年：第五次评估报告（AR5） • 2021/2022 年：第六次评估报告（AR6）

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5.2.3	Own criteria for significance 判定重要性的自定义标准	- Are these in accordance with current knowledge on sectors (Organization Environmental Footprint Sector Rules (OEFSRs) https://ec.europa.eu/environment/eussd/smgp/PEFCR_OEFSR_en.htm , Science Based targets https://sciencebasedtargets.org/sectors ...) - Follow-up audits: Have the criteria for significance been adjusted after implementation of measures? I.e. things that previously (barely) played no role now account for >1% of the result. - 是否符合当前各行业的知识，如欧盟的组织环境足迹行业规则（OEFSRs）：链接，或 Science Based Targets: 链接 后续审核：是否在实施改进措施后调整了判定标准？例如原本微不足道的项目现在占比超过 1%。 -

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Clause	Contents	Guidance for the Assessment
6.2.2 and 6.4.2	Review of emission factors **排放因子的审核**	Materiality is only given with **Base year GHG statement = data reference year** **Exception: If data is not available → latest available year** Critical with: Impact factor: - Energy quantities - Electricity impact factor e.g. energy quantities 2020 → Electricity impact factor for the year 2020 - Mobility e.g. vehicles matching the fleet in the year of the GHG statement (in case of fleet or drive type changes) e.g. reference year XY and impact factors for the fleet from year Z (conservative approach, or not?) Activities: - Company car mileage [km] - Air miles e.g. exact survey of company car mileage from 2015 with 10 employees used in the GHG statement as basis for 2020 with 12 employees (estimation possible but depending on the reference year (e.g. + 20% of the mileage from 2015) implemented or other suitable approach); more precise: logbooks or fuel cards **重要性前提：** 基准年 GHG 声明 = 数据参考年份 **例外：** 若无该年份数据，则使用最近可得年份 **关注重点：** • 能源使用量与相应的影响因子（例如使用 2020 年数据 → 应匹配 2020 年的电力排放因子） • 交通出行（如企业车队变动应考虑年份匹配） **活动数据示例：** • 公司车辆行驶里程 • 飞行里程数 （例如使用 2015 年 10 人的车队数据作为 2020 年 12 人基准的估算依据，可加 20% 或使用更准确的出行记录如行车日志或油卡数据）
6.4.2	Recalculation of base-year GHG inventory **基准年温室气体清单的重算**	The organization shall not recalculate to account for 1)changes in facility production levels 2) closing or 3) opening of facilities 组织不应因以下原因对基准年数据进行重算：产量变动，工厂关闭，新建工厂投入运行

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7.1 GHG emission reduction and removal enhancement initiatives 减排与清除提升措施	EXAMPLE List acc. to the standard on GHG reduction enhancement initiatives 标准中定义的温室气体减排或清除措施列表示例:	**Influences outside the system boundaries can be documented separately but may not be quantified or included in the calculation.** System boundary suitable for quantification. If activities are implemented, they are part of the result; otherwise documented separately. Activities that should be visible in the result of the current (if already implemented) or following inventory: - Management of energy demand and energy use; - Energy efficiency; - Technology or process improvements; - Management of transportation or travel expenses; - Transformation or substitution of fuels; - Waste minimization; - Alternative fuels and raw materials, AFR), used to avoid landfills or incineration; - Handling of coolants (influence on quantities) Things that continue to need „interpretation": - Capture and storage of greenhouse gases, typically in a greenhouse gas reservoirs; - Reforestation (via temporal assumptions) - Handling of coolants (assumptions on leakage, if applicable) 系统边界外的影响可单独记录，但不得纳入量化或计算中。若已实施措施，则其结果应体现在清单中；否则仅记录。 应在当前或后续清单中体现的活动: • 能源需求与使用管理 • 能效提升 • 技术或流程改进 • 出行和交通管理 • 燃料替代或转型 • 减少废弃物 • 替代燃料与原材料（AFR），避免填埋与焚烧 • 制冷剂管理（数量影响） 仍需进一步解释的事项: • 温室气体捕集与封存（GHG 储库） • 植树造林（涉及时间假设） • 制冷剂泄漏假设（若适用）
Clause	Contents	Guidance for the Assessment
9.3.3	Compensation: Offsets or other types of carbon credits 补偿机制：抵消或碳信用	...may report offsets or other types of carbon credits. If so, the organization: ■ shall disclose the **GHG scheme** under which they were generated; ■ may add offsets or other types of carbon credits together if they originate from the same GHG scheme and are of appropriate vintage; ■ shall **not add or subtract offsets or other types of carbon credits** from the organization's inventory **of its direct or indirect emissions**. 若报告中包括碳抵消或其他类型的碳信用，组织应: • 披露其碳信用来源的 GHG 机制; • 若来源一致且发行时间合理，可将多个碳信用合并计算; • 不得将碳信用添加或抵扣于组织的直接或间接排放清单。

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B.5.2	Capital goods 资本货物	**Two methods** are allowed for CCF: Amortization of equipment, machinery, buildings, plants and vehicles according to ISO 14064-1 B.5.2. Could include either the ■ total of emissions associated with the production or ■ an amortized part of the total (based on accounting rules of life time duration). Expected life time duration: a) review whether the capital goods are material for the result b) then review if this has been implemented with implausibly high expected lifetime; for example: building amortization period >2 times financial amortization period (>100a); plant lifetime duration > 50a; or if there is a reasonable justification to the expected lifetime, such as: our oldest plant has been in operation for 45 years, or the building was deliberately built to achieve a lifetime duration of XX years acc. to the management plan ... Note: Actual lifetime duration is usually larger in real terms than in financial amortization periods; however, the latter can be used for guidance. If the lifetime duration is > 2x the financial amortization period, a plausible justification shall be available. Example of a possible justification for e-vehicles: E-vehicle subsidies are linked to a lifetime duration of 10 years **允许两种方法用于计算资本碳足迹（CCF）：** • **按设备、机械、建筑、工厂和车辆的折旧期摊销（参考 ISO 14064-1 B.5.2）** • **总排放量或按预期使用年限分摊** **审核指引：** a) **判断该资本货物对结果是否具有重要性** b) **检查其预期使用寿命是否合理（如建筑摊销年限 > 财务折旧期 2 倍，即 > 100 年，或工厂使用年限 > 50 年）；若年限偏高，应提供合理依据，如："我们最旧的工厂已运营 45 年"或"该建筑依据管理计划设计使用寿命为 XX 年"等。** **备注：实际使用年限通常超过财务折旧期，可参照后者判断。若超过 2 倍，则应提供合理解释。** **例如：电动车补贴政策可能规定使用年限为 10 年。**

Guidance for the Assessment (ISO 14064-2) ISO 14064-2 审核指引

Clause 条款	Contents 内容	Guidance for the Assessment 审核评估指引
9.		

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Guidance for the Assessment (ISO 14067) ISO 14067 审核指引

Clause 条款	Contents 内容	Guidance for the Assessment 审核评估指引
9.		

Special Point: Legal Requirements

- If no inspection books (plant books) are available and thus statements on possible leakages of GWP relevant refrigerants are possible, a nonconformity should be issued in order to be able to prevent this in the future. This should be noted in the report as a limitation.

特别关注点：法律要求

- 如果缺乏检查记录（如工厂设备台账），从而导致无法评估温室效应潜能值（GWP）相关制冷剂的泄漏风险，应出具一项**不符合项**，以防止此类情况在未来再次发生。此问题应作为**审核报告中的限制项**进行说明。

4. Nonconformities as seen by ISO 14064-1, ISO 14064-2 and ISO 14067

Definitions of nonconformities (definition of terms) or negative opinions

The term **nonconformity** is not defined, but occurs several times in the standard. Find some examples from standardization below. In summary: **If nonconformities are detected, the verifier shall evaluate ...**

Conclusion: the assessment of conformity with the requirements or the identification of nonconformities including their correction is a central task.

Standard requirements for the handling of nonconformities

4. ISO 14064-1、14064-2 与 ISO 14067 中对不符合项的规定

术语定义及否定意见

"不符合项"一词虽然未在标准中被明确定义，但在标准中多次出现。以下列举了一些标准化中的示例用法。

总结： 如果发现不符合项，验证人员应对其进行评估.....

结论： 评估是否符合要求，以及识别并纠正不符合项，是验证工作的核心任务之一。

ISO 14064-3: 6.1.3.6.2 Control testing

The verifier shall design and implement evidence-gathering activities to test the oper-

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ating effectiveness of controls. **If deviations are detected, the verifier shall assess whether the deviations affect the ability to rely on those controls, whether additional test of controls are necessary and whether other types of evidence-gathering activities need to be applied**.

If the characteristics of the data are such that only tests of control can be used, the verifier shall design and implement evidence-gathering activities to establish the operating effectiveness of those controls. **If deviations are detected, the verifier shall assess** whether the deviations affect the ability to rely on those controls and whether additional tests of controls are necessary.

ISO 14064-3 6.1.3.6.2 控制测试（Control Testing）

验证人员应设计并实施取证活动，以测试控制措施的运行有效性。

如果发现偏差，验证人员应评估该偏差是否影响对控制措施的信赖度，是否需要额外测试控制措施，或是否应采用其他类型的取证方法。

如果数据特性仅允许使用控制测试，验证人员应通过适当取证活动确认控制措施的运行有效性。若发现偏差，应评估其影响，并决定是否需进行进一步测试。

6.3.2.3 Modified opinion

In order to draft a modified opinion, the verifier shall ensure that **there is no material misstatement** at the level of the GHG statement.

When there is a departure from the requirements of the criteria or a scope limitation, the verifier shall decide what type of modification to the verification opinion is appropriate. In addition to materiality, the verifier shall consider:

- the degree to which the matter impairs the usefulness of the GHG statement;
- the extent to which the effects of the matter on the GHG statement can be determined;
- whether the GHG statement is, or could be understood to be, misleading even when read in conjunction with the verifier's opinion.

6.3.2.3 修改意见（Modified Opinion）

为了形成修改意见，验证人员需确保在温室气体（GHG）声明层面不存在重大错报。

当存在偏离标准要求或验证范围受限的情况时，验证人员应判断适合哪种类型的验证意见修改。

除了"重要性（materiality）"，还应考虑以下因素：

- 该事项在多大程度上削弱了 GHG 声明的实用性；
- 是否能确定该事项对 GHG 声明的具体影响；
- 即便结合验证意见阅读，该 GHG 声明是否仍可能存在误导性。

7.2.3 Proper disclosure

The validator shall evaluate the GHG statement for proper disclosure and shall ensure that material disclosures occur. In assessing proper disclosure, the validator shall:

a) assess whether the GHG statement is accurate and complete;

b) assess whether the disclosure is a fair reflection of the GHG-related activity;

c) assess whether the disclosure contains unintended bias;

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7.2.3 适当披露（Proper Disclosure）

确认人员应评估 GHG 声明是否适当披露，并确保已披露所有重大信息。在判断披露是否适当时，应：

a) 评估 GHG 声明是否准确和完整；

b) 评估披露内容是否真实反映了 GHG 相关活动；

c) 评估是否存在非预期的偏差或误导。

7.3.2.3 Modified opinion

In order to draft a modified opinion, the validator shall ensure that **there is no material misstatement** at the level of the GHG statement.

When there is a **departure from the requirements of the criteria or deficiencies in the assumptions** used to develop future estimates, the validator shall decide what type of modification to the validation opinion is appropriate. In addition to materiality, the validator shall consider:

- the degree to which the matter impairs the usefulness of the GHG statement;
- the extent to which the effects of the matter on the GHG statement can be determined;
- whether the GHG statement is, or could be understood to be, misleading even when read in conjunction with the validator's opinion.

7.3.2.3 修改意见（Modified Opinion）

为了形成修改意见，确认人员需确保在 GHG 声明层面无重大错报。

当存在标准偏离或用于估算未来排放的假设存在不足时，应判断需要哪种类型的修改意见。

除重要性外，确认人员应考虑：

- 该事项对 GHG 声明实用性的影响程度；
- 是否能量化该事项对声明的影响；
- GHG 声明是否可能具有误导性，即便结合确认意见一起阅读时也是如此。

ISO 14065, 4.2 Principles for the validation / verification process: ISO/IEC 17029:2019 shall be followed

4.2.2 Documentation

The **validation / verification process is documented** and forms the **basis for the conclusion and decision on the conformity of the claim with specified requirements.**

ISO 14065 中的相关要求，4.2 验证/确认过程的原则 ISO/IEC 17029:2019 为验证/确认过程提供总体框架，应严格遵循。

4.2.2 文件化要求

验证/确认过程应有完整文件记录，作为判断声明是否符合要求的依据。

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ISO 14065

7.3.7 The validation / verification team shall have data and information auditing expertise to evaluate the environmental information statement, including the ability:
a) to evaluate the information system to determine whether the responsible party has effectively identified, collected, analyzed and reported on relevant environmental information, and has **systematically taken corrective actions to address any misstatements and nonconformities**;

7.3.7 验证/确认团队能力要求

验证/确认团队应具备环境信息审计的专业能力，能够：

a) 审查信息系统，判断责任方是否已有效识别、收集、分析并报告相关环境信息，并系统性地采取措施以纠正错报和不符合项。

ISO 14065 includes a reference to ISO/IEC 17029: see Planning 9.4
Lit b) assess the risk of nonconformity to the criteria

9.4.5 Amendments to the validation / verification plan and evidence-gathering plan shall be approved by the team leader in the following circumstances:
a) change in scope or timing of validation / verification activities;
b) change in evidence-gathering procedures;
c) change in locations and sources of information for evidence-gathering;
d) when the validation / verification process identifies new risks or concerns that could **lead to material misstatements or nonconformities**.

9.4 风险评估与计划调整（依据 ISO/IEC 17029）：9.4. Lit b)应评估不符合项发生的风险。

9.4.5 验证/确认计划和取证计划的变更，应在以下情况由团队负责人批准：

a) 验证/确认活动的范围或时间发生变更；

b) 取证程序发生变更；

c) 取证信息来源或地点发生变化；

d) 在验证/确认过程中识别出新的风险或问题，可能导致重大错报或不符合项。

ISO 14065, 9.5 Validation / Verification execution: ISO/IEC 17029:2019 shall be followed

9.5.4 The verification body shall perform the following activities:
a) collection of sufficient and objective evidence of original data / information, its traceability through the data / information, any further analysis and calculations;
b) **identification of misstatements** and consideration of their materiality; and
c) **assessment of conformity** with respect to specified requirements, taking into account the validation / verification program;

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9.5 验证/确认执行（应遵循 ISO/IEC 17029:2019）

9.5.4 验证机构应执行以下任务：

a) 收集足够且客观的原始数据/信息证据，确保其可追溯性、分析与计算过程；

b) 识别错报并评估其重要性；

c) 在考虑验证/确认方案的前提下，评估声明是否符合规定要求。

ISO 14065, 9.6 Review: ISO/IEC 17029:2019 shall be followed

9.6 Review

9.6.3 The review shall confirm:

a) that the validation / verification activities have been completed in accordance with the agreement and program;

b) sufficiency and adequacy of evidence to support the decision;

c) whether significant findings have been identified, resolved and documented;

NOTE **Significant findings are misstatements and nonconformities identified by the validation / verification team that could affect the opinion.**

ISO 14065 第 9.6 节：评审（Review）应遵循 ISO/IEC 17029:2019 的规定

9.6 评审

9.6.3 评审应确认以下内容：

a) 验证/确认活动已按照协议与计划完成；

b) 支持决策的证据充分且适当；

c) 是否已识别出重大发现、并已解决与记录。

注： 所谓重大发现，是指验证/确认团队识别出的可能影响验证意见的错报和不符合项。

4.1.1 Types of Opinions

Definition of verification / validation opinion: **formal written declaration** to the **intended user** (3.2.4) that provides confidence on the GHG statement (3.4.3) in the responsible party's (3.2.3) GHG report (3.4.2) and confirms conformity with the criteria (3.6.10).

Intended user: individual or organization (3.2.2) identified by those reporting GHG-related information as being the one who relies on that information to make decisions.

Then, the verifier shall reach a conclusion based on the evidence gathered and draft a verification opinion.

ISO 14064-3 differentiates three types of opinions:

- **Unmodified opinion** – in short: standard requirements are met, there is sufficient and appropriate evidence;
- **Modified opinion** – in short: deficiencies or possible deficiencies;
- **Adverse opinion** – in short: no correction of nonconformities, material misstatement(s), insufficient or inappropriate evidence;

This differentiation also expresses the quality of the GHG inventory. Quality criteria are summarized in the following table according to the requirements of ISO 14064-3, clause 6.3.2.2ff:

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4.1.1 意见类型（Types of Opinions）

验证/确认意见的定义：

向预期使用方（3.2.4）出具的正式书面声明，用于对责任方（3.2.3）GHG 报告（3.4.2）中的 GHG 声明（3.4.3）提供信心，并确认其符合相关标准（3.6.10）的要求。

预期使用方： 指由报告 GHG 相关信息的组织所确定的、依赖该信息做出决策的个人或组织（3.2.2）。

验证人员应根据所收集的证据得出结论，并草拟验证意见。

ISO 14064-3 中区分了三种类型的验证意见：

1. **无修改意见**（Unmodified Opinion）
   简述：满足标准要求，证据充分且适当。
2. **修改意见**（Modified Opinion）
   简述：存在缺陷或可能存在缺陷。
3. **否定意见**（Adverse Opinion）
   简述：未纠正不符合项、存在重大错报，或证据不足/不适当。

该区分也反映了温室气体清单（GHG inventory）**的质量状况。**

质量标准依据 ISO 14064-3 第 6.3.2.2 条及后续内容 可汇总如下（如有需要我可以为您整理成表格形式供培训或审核使用）。

Unmodified opinion 无修改意见	**Modified(dissenting) opinion** 修改意见	**Adverse opinion** 否定意见
There is **sufficient and appropriate evidence** to support material emissions, removals or storage. 有充分且适当的证据支持温室气体的实质性排放、清除或储存。	In order to draft a modified opinion, the verifier shall ensure that there is **no material misstatement** at the level of the GHG statement. 为形成修改意见，验证员应确保在 GHG 声明层面不存在重大错报。	There is **insufficient or inappropriate evidence** to support an unmodified or modified opinion; or 缺乏充分或适当的证据，无法支持无修改或修改意见；或
The **criteria** are applied **appropriately** for material emissions, removals or storage; 标准/准则已被适当地应用于实质性排放、清除或储存。	A modified verification opinion, when read in conjunction with the GHG statement, normally will serve **adequately to inform the intended** 修改后的验证意见应与 **GHG** 声明一同阅读，通常能足以使预期使用方了解 **GHG** 声明中存在的缺陷或潜在缺陷。	**criteria are not appropriately applied for material emissions**, removals or storage; or 标准/准则未被适当地应用于实质性排放、清除或储存；或
	user(s) of any deficiencies or possible deficiencies in the GHG statement. 使使用者了解 GHG 声明中存在的缺陷或潜在缺陷。	

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The **effectiveness of controls** has been evaluated when the verifier intends to rely on those controls. 当验证员拟依赖控制措施时，已对控制措施的有效性进行了评估。	There are **requirements in case of non-material misstatements**: see ISO 14064-3 6.3.2.3 对于非重大错报的情形，有相关处理要求：参见 ISO 14064-3 第 6.3.2.3 条。	the **effectiveness of controls cannot be determined** when the verifier intends to rely on those controls; 当验证员拟依赖控制措施时，无法判断控制的有效性；
		If the responsible party (client) **does not correct any material misstatement or nonconformity in an arranged period of time**, the verifier shall take this into consideration when reaching the conclusion. 若责任方（客户）未能在约定时间内纠正任何重大错报或不符合项，验证员在形成结论时应将此考虑在内。

With regard to misstatements, the following opinions types could be issued: 关于错报的不同意见类型说明

Type of misstatement 错报类型	**Extent of misstatement** 错报程度	**Opinion type** 可出具的意见类型
There is **no misstatement**.无错报	None 无	Unmodified 无修改意见
The **misstatement** is **not material**	Not pervasive 非广泛性	Unmodified/Modified 无修改意见 / 修改意见
The **misstatement** is **material**	Not pervasive 非广泛性	Modified 修改意见
	Pervasive 广泛性	**Adverse** 否定意见
There is **a misstatement**, but the **type is unknown**	Not pervasive 非广泛性	Modified 修改意见
	Pervasive 广泛性	**Disclaimed** 放弃出具意见

NOTE 1 When misstatement is not material and not pervasive, opinions may be modified when program requirements dictate.

NOTE 2 Pervasive misstatements, individually or aggregate, are those that are:

— not confined to specific elements, classifications or line items of the environmental information statement;

— even if confined, representative of a substantial portion of the environmental information statement;

— fundamental to the intended user's understanding of the environmental information statement.

Quality Austria may choose **not to issue an opinion** when the engagement is terminated prior to completion (see ÖNORM EN ISO 14065:2022, clause 9.7.1.5).

Quality Austria may disclaim the issuance of an opinion when it is **unable to obtain sufficient and appropriate evidence** to come to a conclusion. In this case, **Quality Austria shall ensure that it has been unable to obtain sufficient appropriate evidence** and can conclude that the **possible effects on the environmental information statement of undetected**

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material misstatement(s) are material and pervasive.

At the conclusion of an engagement to **verify statements of historical information**, Quality Austria shall **issue an opinion**, unless it has disclaimed the issuance of an opinion or the engagement type is AUP (agreed-upon procedure). An **opinion** providing **assurance to intended users** shall be based upon the **verification of sufficient and appropriate historical evidence**. Only unmodified or modified opinions provide assurance to intended users.

At the conclusion of an engagement to **validate statements about the outcome of future activities, Quality Austria shall issue an opinion**, unless it has disclaimed the issuance of an opinion. A validation opinion on the **reasonableness of the assumptions, limitations and methods used to forecast** information shall be based upon the **evaluation of sufficient and appropriate information**.

The opinion may contain statements that **limit the liability of Quality Austria**.

A **modified opinion** shall contain a description of the **reason for the modification**. If the reason for the modified opinion is **quantitative**, Quality Austria shall indicate the **value of the material misstatement** and its effect on the environmental information statement.

An **adverse opinion** shall include the **reason(s)** for the adverse opinion.

When **disclaiming** the issuance of an opinion, Quality Austria shall provide an **explanation**.

Intentional misstatement (ÖNORM EN ISO 14064-3 5.4.3): If a matter comes to the verifiers / validators attention that causes the verifier / validator to believe in the existence of intentional misstatement or noncompliance by the responsible party with laws and regulations, the verifier / validator shall communicate the matter to the appropriate parties as soon as practicable.

See report template FO_27_01_206_Report template_14064-1

注 1： 当错报不具重大性且不具广泛性时，若验证方案另有要求，亦可出具修改意见。

注 2： 所谓"广泛性错报"，可单独或合并地理解为以下情况：

- 并非局限于环境信息声明中的某一要素、分类或项目；
- 即使有限制，仍代表环境信息声明中的大量内容；
- 属于影响预期使用方对环境信息声明理解的根本要素。

Quality Austria 可在验证工作在完成前被终止的情况下选择不出具意见（见 ÖNORM EN ISO 14065:2022 第 9.7.1.5 条）。

若无法获得充分且适当的证据以形成结论，Quality Austria 可放弃出具意见。在此情况下，Quality Austria 应确保其确实未能获得足够适当的证据，并能认定未被发现的重大错报对环境信息声明的潜在影响具有重大性且广泛性。

在完成对历史信息声明的验证任务时，除非放弃出具意见或任务类型为商定程序（AUP），Quality Austria 应出具一份意见。可为预期使用方提供担保的意见必须基于对充分且适当的历史证据的验证。仅无修改意见和修改意见可向预期使用方提供担保。

在完成对未来活动结果声明的验证任务时，除非放弃出具意见，Quality Austria 应出具意见。验证意见关于预测信息所依据的假设条件、限制和方法的合理性，应基于对充分且适当信息的评估。
意见中可包含限制 Quality Austria 责任的声明。

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修改意见应说明修改的原因。若原因为可量化的，Quality Austria 应指明重大错报的数值及其对环境信息声明的影响。

否定意见应包含出具该意见的原因。

若放弃出具意见，Quality Austria 应提供解释说明。

蓄意错报（ÖNORM EN ISO 14064-3 第 5.4.3 条）：若验证员/确认员在工作过程中发现可能存在责任方故意错报或违反法律法规的情况，应尽快向相关方报告此事。

参考报告模板： FO_27_01_206_Report template_14064-1

5. Practical Experience and Tips from Verifications / Validations and Trainings

The following **influencing factors** could limit the result and its validity; see ISO 14064-3 Annex B.3:

- **inadequate or poorly documented procedures** or adherence to procedures for collecting data, quantifying emissions and preparing GHG statements;
- **lack of staff competence** in procedures for collecting data, quantifying emissions and preparing GHG statements;
- **lack of management involvement** in preparing GHG statements;
- **failure** to identify all material emissions and removals;
- errors in **unit conversions**;
- **inconsistent preparation** of information from prior periods without disclosure;
- **misleading presentation of material**, such as highlighting favorable data or trends;
- **inconsistent quantification methods** or reporting between sites, division or other segments of the GHG statement;
- **inadequate disclosures of uncertainties and assumptions**;
- inappropriate or out-of-date global warming potentials;
- management override of internal controls;

5. 验证/确认及培训中的实务经验与提示

以下影响因素可能会限制结果的有效性与合法性，详见 ISO 14064-3 附录 B.3：

- 用于数据收集、排放量量化及编制 GHG 声明的程序不充分或缺乏文档化，或对程序的执行不到位；
- 员工在数据收集、排放量量化和 GHG 声明编制方面缺乏相应能力；
- 管理层未参与 GHG 声明的编制；
- 未识别所有重大排放和清除项目；
- 单位换算存在错误；
- 来自前期的信息准备不一致，且未作披露；
- 材料表达具有误导性，例如突出展示有利数据或趋势；

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- 不同站点、部门或 GHG 声明的其他组成部分之间采用不一致的量化方法或报告方式;
- 不确定性和假设披露不充分;
- 使用了不适当或过时的全球变暖潜能值（GWP）;
- 管理层绕过内部控制措施;

Additional considerations for potential influencing factors:

- **Existing certifications**: is the client certified acc. to ISO 14001 and/or ISO 50001, therefore monitors, measures, and evaluates the environmental and energy data according to clause 9.1 of the standards?
- **Measuring equipment**: Measuring devices are not calibrated
- **Data**:
  - Most of the data are not measured, but are based on assumptions and estimates;
  - Are the data collected automatically or do they have to be read and documented (possible errors during transmission);
- **Assumptions**: What are the underlying assumptions and are they documented? Are the assumptions plausible?
  - Lifetime assumptions for devices and equipment
- **State of the art**
- **Electricity**
  - Electricity balancing with eco-label certified electricity or with electricity labeling according to ELWOG? (Electricity generation mix Austria)
  - Are the country-specific electricity generation mixes and/or the national energy suppliers known? Sources?
- **Leakages**: How are possible leakages identified and recorded, e.g. for F-gases, natural gas pipelines?
- **Fleet**:
  - Is the fleet data based on consumption data or on mileage readings?
  - Are the data collected via databases or transferred manually form driver's logbooks?
  - Do the mileage readings also include private use of the vehicle?
- **Scope 3**:
  - What processes and activities are not reported at scope 3 level?
  - How is the employee mobility data collected? (E.g. employee surveys: response, extrapolations, surcharges etc.)
  - ...
- **Energy**:
  - **Methane** plays a bigger role than thought according to recent (September 2022) reports:

    Overview:

    Formation of methane and sources

    Methane (CH_4) is formed when organic material is decomposed under exclusion of air:

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- when coal, oil, or natural gas is mined;
- in landfills, or sewage treatment plants;
- during wet rice cultivation;
- in wetlands and oceans;
- by ruminants: livestock account for about one-third of man-made methane emissions;
- natural gas flaring: The measurements from more than 300 exhaust-gas plumes from natural gas flares showed that the methane is burned with an average efficiency of only 95.2 percent. In addition, an average of 4.1 percent of the flares do not burn because they either have died out or were never properly ignited. There, methane escapes unburned into the air. This means that the overall efficiency with which flares destroy the methane in natural gas is only 91.1 percent.
  Free translation from: https://science.orf.at/stories/3215341/

Strongest methane increase since measurements began
Free translation from: ***https://orf.at/stories/3258905/***
*Methane, the second most dangerous greenhouse gas after CO_2, **rose at a record pace in 2021**. **Concentrations in the atmosphere increased by 17 ppb** (parts per billion). That was the highest increase since records began in 1983, the U.S National Oceanic and Atmospheric Administration (NOAA) reported, based on measurements from the Mauna Loa Observatory in Hawaii. **Already in 2020**, methane concentrations had risen faster than at any time since records began.*
*.... At **1896 ppb, the methane concentration was more than two and a half time higher than before the start of industrialization**, writes the German science magazine "Spektrum".*

Cause remains unclear
*The report goes on that it is not completely clear why the methane concentration in the atmosphere is currently increasing so strongly. At the turn of the millennium, methane levels were stable for about a decade and have only been rising significantly again since 2007. Where exactly the additional gas is coming from is a matter of debate. The sources are difficult to prove with certainty because there are **many natural and synthetic methane sources**, including in agriculture, whose changes are hard to measure. Many experts suspect **leaks in the production and distribution of natural gas as the main cause of the problem**, because its production has increased significantly since the turn of the millennium, but there are also analyses that contradicts this.*

Policy and Law
The EU is currently developing a European strategy for reducing methane emissions as well as a Regulation for reducing methane emissions in the energy sector:
☐ COM ((2020) 663 final (Brussels 14.10.2020) COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS on an EU strategy to reduce methane emissions (BEILAGE 2)
☐ COM (2021) 805 final/2 Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on methane emissions reduction in the energy sector and amending Regulation (EU) 2019/942
{SEC(2021) 432 final} - {SWD(2021) 459 final} - {SWD(2021) 460 final

其他潜在影响因素的考虑：

- 是否已取得现有认证：客户是否已取得 ISO 14001 和/或 ISO 50001 认证，因此是否已根据标准第 9.1 条对环境与能源数据进行监控、测量与评估?
- 测量设备：测量设备是否已校准?
- 数据：
  - 大部分数据并非测量，而是基于假设与估算；
  - 数据是否为自动采集，还是需人工读取与记录（可能在传输中出错）；

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- **假设前提**：基础假设是什么？是否有记录？这些假设是否合理？
- 设备及器具的使用年限假设；
- 是否符合技术现状；
- **电力数据：**
  - 是否以生态标签认证电力进行电力平衡？或依照《电力经济法（ELWOG）》标示电力来源？（奥地利的电力结构）；
  - 是否已知各国的电力结构或国家能源供应商？数据来源为何？
- 泄漏：例如 F 类气体、天然气管道，可能泄漏的识别与记录方式是什么？

- **车队数据：**
- 是否基于能耗数据或行驶里程采集？
- 数据是通过数据库采集，还是人工从驾驶日志中转录？
- 里程数据是否包含私人用途？

- 范畴三（Scope 3）相关内容：
- 哪些流程和活动未在 Scope 3 级别报告？
- 员工出行数据如何采集？（如员工调查：响应率、外推方法、附加因素等）
- .....
- **能源方面：**
- 根据最近（2022 年 9 月）报告，甲烷的作用比之前认为的更大。

简要概述：

甲烷的形成与来源：

甲烷（CH_4）是在有机物在无氧条件下降解时形成的，例如：

- 在煤炭、石油或天然气开采过程中；
- 在垃圾填埋场或污水处理厂中；
- 在水稻湿地种植中；
- 在湿地和海洋中；
- 在反刍动物体内：牲畜约占人为甲烷排放的三分之一；
- 天然气燃烧塔（flaring）：从 300 多个天然气燃烧排气羽流中测得的数据显示，甲烷燃烧的平均效率仅为 95.2%。此外，平均有 4.1% 的燃烧器未点燃或已熄灭，导致甲烷直接逸出至大气。因此，燃烧塔对甲烷销毁的整体效率仅为 91.1%。

自由翻译来源：https://science.orf.at/stories/3215341/

自测量以来最剧烈的甲烷增长

自由翻译来源：https://orf.at/stories/3258905/

甲烷是继二氧化碳之后第二严重的温室气体，2021 年其增长速度创历史新高。大气中的浓度上升了 17 ppb（十亿分之一）。据美国国家海洋和大气管理局（NOAA）报告，基于夏威夷毛纳罗亚天文台的观测数据，这是自 1983 年有记录以来的最大增幅。而早在 2020 年，甲烷浓度的增长速度也已达到历史新高。

浓度达到 1896 ppb，是工业化前水平的两倍半以上，德国科学杂志《Spektrum》报道称。

原因仍不明确

报告进一步指出，目前甲烷浓度为何显著上升尚不完全清楚。在千禧年之交，甲烷水平曾保持约十年稳定，自 2007 年起再次显著上升。额外甲烷的具体来源仍有争议。由于自然与人

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为的甲烷源众多，且农业等来源的变化难以监测，因此难以准确追踪。许多专家怀疑是天然气生产与输送中的泄漏为主要原因，自千禧年之后天然气产量大幅提升，但也有研究对此观点提出质疑。

政策与法律方面

欧盟目前正在制定减少甲烷排放的欧洲战略及相关法规，具体包括：

- COM (2020) 663 final（2020 年 10 月 14 日，布鲁塞尔）
  欧盟委员会向欧洲议会、理事会、欧洲经济与社会委员会及地区委员会提交的《欧盟减少甲烷排放战略》（附件 2）
- COM (2021) 805 final/2
  欧洲议会与理事会关于能源行业减少甲烷排放的提案法规，并修订《条例 (EU) 2019/942》
  {SEC(2021) 432 final} - {SWD(2021) 459 final} - {SWD(2021) 460 final}

6. Related Standards and Guidelines in the ISO 14000 Family of Standards

- EN ISO/IEC 17029 Edition: 2020-02-15; Conformity Assessment — General prin- ciples and requirements for validation and verification bodies
- ÖNORM EN ISO 14065 Edition: 2022-02-15, General principles and requirements for bodies validating and verifying environmental information (ISO 14065:2020)
- ÖNORM EN ISO 14064-3 Edition: 2019-11-15 Greenhouse gases — Part 3: Spec- ification with guidance for the verification and validation of greenhouse gas state- ments (ISO 14064-3:2019)
- ISO 14064-1:2018: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals
- ISO 14064-2:2019 Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements
- ISO 14066-2011 Greenhouse gases – Competence requirements for greenhouse gas validations and verification teams
- ISO 14067:2018 Greenhouse gases — Carbon footprint of products — Require- ments and guidelines for quantification

6. ISO 14000 系列相关标准与指南

- EN ISO/IEC 17029（2020-02-15 版）：合格评定——验证与确认机构的一般原则与要求
- ÖNORM EN ISO 14065（2022-02-15 版）：验证与确认环境信息机构的一般原则与要求（等同于 ISO 14065:2020）
- ÖNORM EN ISO 14064-3（2019-11-15 版）：温室气体——第 3 部分：温室气体声明验证与确认的规范与指南（等同于 ISO 14064-3:2019）
- ISO 14064-1:2018：组织层面温室气体排放与清除量化与报告的规范与指南
- ISO 14064-2:2019：温室气体——第 2 部分：项目层面温室气体减排或清除增强的量化、监测与报告的规范与指南
- ISO 14066:2011：温室气体——温室气体验证与确认团队的能力要求
- ISO 14067:2018：温室气体——产品碳足迹——量化的要求与指南

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