

能源及二氧化碳排放綜合審計報告格式

1. 摘要

- (a) 概述在有關建築物的公用地方進行能源及二氧化碳排放綜合審計的用途。
- (b) 審計範圍涵蓋各項活動（範圍 1 及 2）的現行能源消耗量及溫室氣體排放水平。
- (c) 各項減少能源消耗量及溫室氣體排放的建議摘要，包括但不限於採取管理措施，以及提升有關屋宇裝備裝置的能源效益及節約能源。
- (d) 以上(c)項建議的估計費用及可帶來的能源節約量／溫室氣體減排量。

2. 背景資料

- (a) 報告機構名稱；
- (b) 報告機構描述；
- (c) 報告機構的聯絡人；
- (d) 報告期（請填寫開始及結束日期）；
- (e) 所選擇的建築物邊界範圍 -
 - (i) 建築物所在的地點；
 - (ii) 所選擇的有關建築物及／或建築物邊界的用途描述；
 - (iii) 所選擇的建築物邊界的描述，包括納入報告的公用地方／中央屋宇裝備的詳細資料（例如各自的建築樓面面積）；
 - (iv) 沒有納入報告的公用地方／中央屋宇裝備的描述（須列具理由）；以及
 - (v) 審計小組成員。

3. 碳排放審計

- (a) 碳排放審計的目的；
- (b) 所選擇的營運界線範圍 -

- (i) 納入／沒有納入能源及二氧化碳排放綜合審計範圍 1 的活動描述（須列具理由）；
 - (ii) 納入／沒有納入能源及二氧化碳排放綜合審計範圍 2 的活動描述（須列具理由）；以及
 - (iii) 納入能源及二氧化碳排放綜合審計範圍 3 的活動描述。
- (c) 量化排放量及減除量的方法 -
- (i) 採用《**香港建築物（商業、住宅或公共用途）的溫室氣體排放及減除的核算和報告指引**》最新版本所載的簡化方法及轉化系數予以量化的活動的一覽表；
 - (ii) 採用其他量化方法及轉化系數的詳情（包括所需的參考資料）；
- (d) 溫室氣體排放及減排資料（見《**香港建築物（商業、住宅或公共用途）的溫室氣體排放及減除的核算和報告指引**》最新版本所載的匯報表格樣本）；
- (e) 為使在緊接能源及二氧化碳排放綜合審計報告完成後數年及長遠來說，可減少溫室氣體排放，就策略、措施、計劃、項目、活動事宜提出建議（包括 4(f)項所載的建議），並說明估計費用（資本及營運）、可減少的溫室氣體排放量（如可量化）及其他具體效益。
- (f) 溫室氣體補償措施及計劃的資料 -
- (i) 根據內部及／或外部基準（如有）（包括所採用的任何比率指標）評核溫室氣體排放表現的描述；
 - (ii) 為改善溫室氣體排放表現而確定的範疇及範圍；以及
 - (iii) 為改善溫室氣體排放表現而進行的活動／計劃的描述，包括進行實地補償活動。
- (g) 其他可選擇報告的資料；
- (h) 數據來源、參考資料等一覽表

4. 能源審核

- (a) 能源審核的目的；

(b) 能源審核的範疇；

(c) 描述經審核的設備／系統的說明 -

- (i) 所有有關設備／系統、相關的功率、額定值及設計條件等；
- (ii) 樓宇管理部門、操作和維修人員、使用者及現場勘查所提供的資料；
- (iii) 設計條件（如知道），若未能掌握設計條件，應說明在進行能源及二氧化碳排放綜合審計時獲採納作為基本參考和計算的各項條件；
 - 部分說明可包括 -
 - i. 系統分區佈局；
 - ii. 各場地的暖通空調裝置；
 - iii. 照明裝置；
 - iv. 電力裝置；
 - v. 升降機及自動梯裝置；
 - vi. 水管裝置和排污系統；
 - vii. 熱水系統；
 - viii. 其他主要耗能設備／系統。

(d) 審核結果

- (i) 將審核結果有系統地記錄（例如按系統類型排序、按樓層排序或按用途排序等）；
- (ii) 有特別需求的樓層／場地的相關說明；
- (iii) 有關冷卻裝置負荷、熱負荷、照明負荷、電負荷及每年耗能量的計算（應以附件形式提供詳細計算）；
- (iv) 對操作和維修程序及相關實務的審核結果；以及
- (v) 根據相關結果初步鑑定的潛在能源管理機會。

上述內容應著眼於與潛在能源管理機會的相關問題，並應有系統地將各項結果編號，以方便參考。由機電工程署發布的《能源審核指引》附件 J 提供了參考示例。

(e) 分析及鑑定能源管理機會 -

- (i) 根據原設計（若可取得資料）及／或實際現場測量所得數據，對設備／系統的實際表現進行比較，以找出任何差異及導致此等差異的原因；
- (ii) 鑑定所有潛在的能源管理機會及相關的支持理據（應以附件形式提供可達到能源節約量的計算結果及說明）；

- (iii) 實施經鑑定的能源管理機會的成本（應註明相關的參考編號，而每個審核結果應給予一個參考編號、詳細計算結果，同時應以附件形式提供平面圖和設計原理圖）；
- (iv) 比較同一能源管理機會的不同解決方案；
- (v) 將能源管理機會分類（I、II 或 III 類）；
- (vi) 有系統地列示各項能源管理機會（例如按系統類型排序、按樓層排序或按用途排序等）；
- (vii) 實施經鑑定的能源管理機會的時間表；
- (viii) 鑑定需要進一步研究的場地（如有）；
- (ix) 說明實施經鑑定的能源管理機會所涉及的有關人士，以及可能遇到的困難和克服這些困難的方法；以及
- (x) 在總結部分，列示每項經鑑定的能源管理機會的初期投資金額及回本期。

(f) 建議

- (i) 每項經鑑定的能源管理機會的初期投資金額及回本期；
- (ii) 使用系統性列示各項建議的一覽表；
- (iii) 將具類似性質／位置／用途的項目歸納一起，或根據裝置的類型（I、II 或 III 類）分列。

5. 總結

為使在緊接能源及二氧化碳排放綜合審計報告完成後數年及長遠來說，可有效減少溫室氣體排放，向申請機構提供建議措施摘要。

6. 證明人所簽署的聲明

證明人所簽署的聲明（有關的聲明格式和字眼，請參閱“ISO 14064-3:2006”附件 A.2.9.1 的一般規定及“ISO 14064-3:2006”附件 A.2.9.2 的指引，以釐正聲明）。

以下是多個摘錄自“ISO 14064-3:2006”附件 A.2.9.1 的聲明樣本，以供參考。

**A.2.9.1 General*

A.2.9.1.1 A measure of uniformity in the form and content of the validation or verification statement is desirable because this helps to promote the reader's

understanding and to identify unusual circumstances when they occur.

The validation or verification statement should include the following elements:

- a) Name, address and other relevant contact information for the responsible party and/or the client,*
- b) A statement that the validation or verification is performed according to this part of ISO 14064,*
- c) An opening or introductory paragraph containing*
 - 1. Identification of organization's or GHG project's GHG assertion against which the validation or verification testing was conducted, and*
 - 2. A statement of the roles and responsibilities of the organization's or GHG project's management and the roles and responsibilities of the verifier or validator,*
- d) A scope paragraph containing*
 - 1) reference to the principles and requirements of relevant standards or GHG programmes against which the validation or verification was conducted,*
 - 2) reference to the validation or verification scope, objectives and criteria agreed with the client, including the level of assurance required, and*
 - 3) a description of the work the validation or verification team performed, including the techniques and processes used to test the GHG information and associated GHG assertion,*
- e) A conclusion paragraph containing*
 - 1) a reference to the GHG reporting framework or standard, or the GHG programme requirements (as appropriate) used to prepare the GHG assertion,*
 - 2) GHG information or performance validated or verified (e.g. project plan, baseline GHG emissions or removals, GHG emissions, removals, emission reductions, removal enhancements),*
 - 3) the level of assurance provided by the validation or verification, consistent with the agreed validation or verification scope, objectives and criteria,*
 - 4) presentation of qualifications, if any, and*
 - 5) conclusions on the GHG assertion, including any limitations or qualifications to the conclusion,*
- f) the date of validation or verification statement,*
- g) the validator or verifier contact details,*
- h) an authorized signature from the validator or verifier,*

A.2.9.1.2 Some engagements require more extensive reporting than the content of

the statement as listed above. This could depend, for example, on reporting requirements in GHG programmes or the needs of the responsible party due to requirements of intended users. The extent of reporting should be agreed with the client but, as a minimum, should include the content as listed in A.2.9.1.1.

A.2.9.1.3. The validator or verifier should produce a draft validation or verification statement to be sent to the client and/or the responsible party to review for factual correctness. If the responsible party is satisfied that the validation or verification statement is factually correct, then the validation or verification body is able to release the validation or verification statement in a final form. If the responsible party requires any significant amendments to be made to the draft statement, then the revised content should be agreed with the team leader prior to publication.

A.2.9.1.4 In GHG project validations, not all issues are resolved until the GHG project has been commissioned or has reached day-to-day operational status. This situation should be reflected in the validation statement in the form of limitations or qualifications that become invalid once the GHG project has achieved operational status.)

The sample statements from **Annex A.2.9.2 of ‘ISO 14064-3:2006’** are as follows:

*(*A.2.9.2 Qualifying the validation or verification statement*

A.2.9.2.1 The validation or verification statement should clearly express any circumstance where the validator or verifier

- is of the view that one, some, or all aspects of the GHG information does not conform to the agreed verification or validation criteria,*
- is of the view that the responsible party’s GHG assertion is inappropriate in relation to the agreed validation or verification criteria,*
- is unable to obtain, appropriate, objective evidence to assess one or more aspects of conformity of the GHG information with the agreed validation or verification criteria and the responsible party’s GHG assertion, or*
- has found it necessary to limit or qualify the opinion.*

A.2.9.2.2 Although circumstances that require the validator or verifier to qualify the validation or verification statement vary considerably, they can be categorized in two groups as follows.

- a) *The GHG assertion is affected by a departure from the requirements specified by the GHG program, including*
- *an inappropriate treatment (e.g. incorrect GWPs applied during the reporting period),*
 - *an inappropriate estimation or quantification of a GHG source, sink or reservoir in the GHG assertion (e.g. overestimation of carbon stocks),*
or
 - *a failure to disclose essential information or to present information in an appropriate manner (e.g. inadequate explanation of the permanence of a GHG reservoir).*
- b) *The validator or verifier is unable to obtain sufficient appropriate evidence to determine whether there has been a departure from the requirements specified by the GHG programme. These are circumstances where the validator or verifier has not been able to apply all the tests and procedures considered necessary in the circumstances. The result is that there is not sufficient appropriate evidence to form an opinion as to whether the GHG assertion is presented fairly in accordance with requirements of the GHG programme. Such limitations arise in a number of situations, including*
- *circumstances related to the timing of the validator's or verifier's work (e.g. a verification conducted during unplanned maintenance leading to inability to observe operational practices or monitoring equipment in operation),*
 - *circumstances beyond the control of the organization or GHG project, or the validator or verifier (e.g. destruction of GHG information in a fire), or*
 - *a limitation imposed or created by the organization or GHG project (e.g. failure to maintain adequate GHG records).*

A.2.9.2.3 *When there is a departure from the requirements of the GHG programme or a scope limitation, the validator or verifier must decide what type of qualification or modification to the validation or verification statement is appropriate. In addition to materiality, the validator or verifier should consider*

- *the degree to which the matter impairs the usefulness of the GHG assertion,*
- *the extent to which the effects of the matter on the GHG assertion can be determined, and*
- *whether the GHG assertion is, or could be understood to be,*

misleading even when read in conjunction with the validator's or verifier's statement.

A qualified validation or verification statement, when read in conjunction with GHG assertion, normally will serve adequately to inform the intended user of any deficiencies or possible deficiencies in the GHG assertion.

A.2.9.2.4 When the validator or verifier concludes that a qualification is necessary, the validation or verification statement should clearly draw attention to the qualification by modifying the validation or verification statement. The statement should include the following.

- a) A qualification paragraph, inserted between the scope and opinion paragraphs of the statement, that includes*
 - all qualifications,*
 - an adequate explanation of the reasons for each qualification,*
 - a clear indication of how and, when reasonably determinable, to what extent the GHG assertion is affected, and*
 - if the affect on the GHG assertion of the matter causing the qualification is not reasonably determinable, a statement of such and reasons for the determination.*
- b) The opinion paragraph should include*
 - wording appropriate for the type of qualification(s), and*
 - a reference to the qualification paragraph.*

In addition, when the qualification results from a limitation in the scope, the scope paragraph should contain a reference to the qualification paragraph.

7. 參考資料

- [1] 國際標準化組織 ISO 14064-3:2006-Part 3: “Specification with guidance for the validation and verification of greenhouse gas assertions”
- [2] 環境保護署和機電工程署(2008年)編製的《香港建築物(商業、住宅或公共用途)的溫室氣體排放及減除的核算和報告指引(2008年版)》
- [3] 機電工程署(2004年)編製的《能源審核指引》