

METHOD FOR ASSESSING GREENHOUSE GASES

FIELD OF THE INVENTION

[0001] The present invention relates to assessment of greenhouse gases, and in particular, to a method for assessing greenhouse gases.

BACKGROUND OF THE INVENTION

[0002] Carbon emission has become one of the significant factors that affect global climate change. Enterprises need to deeply appreciate the greenhouse gas emission conditions for sustainability and environmental protection. Therefore, the assessment of greenhouse gases has become a crucial task required to be performed by many enterprises.

[0003] Although there are already provisions about the assessment of greenhouse gases, for example, the provision of assessment of ISO 14064, assessment steps of these provisions of assessment are too numerous that only with a thorough understanding of the assessment steps by the assessment personnel of the enterprises or organizations, can various emission sources from the enterprises or organizations be identified and investigated. Then the activity data of each emission source is obtained and the emission quantity of greenhouse gases from each emission source is calculated according to an emission factor. For those who are unfamiliar with assessment steps, they have no idea and even do not know how to identify emission sources, resulting in a low efficiency of assessing greenhouse gases and a waste of time and human resources.

SUMMARY OF THE INVENTION

[0004] In view of this, an objective of the present invention is to

provide a method for assessing carbon footprints of products, that can improve the efficiency of product carbon footprint assessment.

[0005] To achieve the above objective, a method for assessing greenhouse gases provided by the present invention is implemented by a system for assessing greenhouse gases. The method for assessing greenhouse gases includes the following steps:

A. setting basic project data of an assessment project, the basic project data including an industry category;

B. selecting one of the questionnaires corresponding to the industry category from a plurality of predetermined emission source identification questionnaires of a questionnaire database according to the industry category of the basic project data so as to form an emission source identification questionnaire, the emission source identification questionnaire including a plurality of options and the options corresponding to a plurality of emission sources respectively, and providing a selection interface of the emission source identification questionnaire, for a user to select a plurality of the options so as to form a plurality of selected options; and

C. generating an identification result according to the selected options selected by the user, the identification result including the multiple emission sources corresponding to the selected options.

[0006] The present invention has the effects of making the user select options through the emission source identification questionnaire corresponding to the industry category, assisting the user in identifying the used emission sources, and improving the efficiency of assessing greenhouse gases by the user.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007]

FIG. 1 is a schematic diagram of connection of a system for assessing greenhouse gases according to a preferred embodiment of the present invention;

FIG. 2 is a flowchart of a method for assessing greenhouse gases according to a preferred embodiment of the present invention;

FIG. 3 is a schematic diagram that discloses a selection interface of an emission source identification questionnaire;

FIG. 4 is a schematic diagram that discloses an identification result;

FIG. 5 is a schematic diagram that discloses an emission source inventory;

FIG. 6 is a schematic diagram that discloses an emission source inventory with an emission factor;

FIG. 7 is a schematic diagram that discloses an emission source inventory with the emission quantity of various greenhouse gases; and

FIG. 8 is a schematic diagram that discloses an integrated information interface.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0008] To describe the present invention more clearly, the following is a detailed description with reference to preferred embodiments and in conjunction with the drawings. Referring to FIG. 1, a system 1 for assessing greenhouse gases according to a preferred embodiment of the present invention is configured to implement a method for assessing greenhouse gases of this embodiment. The system 1 for assessing greenhouse gases includes a server 10 and a database 20. The server 10 is

configured to execute a program of assessing greenhouse gases and is connected to the database 20. The server 10 allows a plurality of electronic devices 30 to connect through a network 40. The network 40 may be, for example, an Internet or a local area network. Each of the electronic devices 30 may be a device that can be connected to the network, such as a computer, a mobile phone and a tablet computer. Each of the electronic devices 30 is operated by a user of an enterprise or an organization. The server 10 and the database 20 may be located on the same host, or may be located on different hosts respectively and connected through the network 40.

[0009] The database 20 includes a questionnaire database 22 and an emission factor database 24. The questionnaire database 22 stores a plurality of predetermined emission source identification questionnaires. These predetermined emission source identification questionnaires correspond to a plurality of industry categories, respectively. The industry categories may include, for example, a cement industry, a panel manufacturing industry, an integrated circuit manufacturing industry, an automotive industry, a communication network industry, etc.. The above industry categories are provided only for illustrative purposes and are not limited thereto. Each of the predetermined emission source identification questionnaires includes a plurality of options, and these options correspond to a plurality of emission sources, respectively. The emission sources may, for example, at least correspond to Category 1 and Category 2 of ISO 14064-1:2018, or may correspond to Categories 3-6. The predetermined emission source identification questionnaires are designed for various industry categories, and various emission sources to be used by the various industry categories are preselected. Moreover, these

questionnaires are designed in the form of electronic questionnaires, allowing each of the emission sources to have corresponding options for users to choose from.

[0010] Taking the cement industry as an example, the emission sources may include a plurality of emission sources of direct greenhouse gas emission (Category 1) and a plurality of emission sources of indirect greenhouse gas emission caused by input energy (Category 2), where the emission sources of direct greenhouse gas emission may include stationary combustion emission sources (diesel, natural gas, heavy oil No. 4-6 and the like), mobile combustion emission sources (diesel, motor gasoline, liquefied petroleum gas, etc.), industrial process emission sources (acetylene, welding rods, CO₂ steel cylinders, etc.), and anthropogenic fugitive emission sources (water and fertilizer and septic tanks, carbon dioxide fire extinguishers, etc.); and the emission sources of indirect greenhouse gas emission caused by input energy may include purchased electricity, purchased steam, purchased heat, etc.. The emission sources may further include emission sources of indirect greenhouse gas emission caused by transportation (Category 3), indirect greenhouse gas emission caused by the use of products by the organization (Category 4), indirect greenhouse gas emission caused by the use of products from the organization (Category 5) and indirect greenhouse gas emission caused by other sources (Category 6).

[0011] The emission factor database 24 stores an emission factor of a greenhouse gas (such as carbon dioxide CO₂, methane CH₄ and nitrous oxide N₂O) of a plurality of emission sources. For example, the emission factor of the greenhouse gas CO₂ corresponding to the motor gasoline emission sources is 2.2631328720 metric tons/kiloliter, and the emission

factor of the greenhouse gas CH₄ corresponding to water and fertilizer and septic tank emission sources is 0.0000127500 metric tons/man-day. Of course, the same emission source may also correspond to a variety of greenhouse gases.

[0012] By the above system 1 for assessing greenhouse gases, the method for assessing greenhouse gases of this embodiment can be performed, including the steps shown in FIG. 2.

[0013] Step S11: Set basic project data of an assessment project, the basic project data including an industry category.

[0014] In this embodiment, a user may operate the electronic device 30 to connect to the server 10, and the server 10 provides a project setting interface, which is transferred to a screen of the electronic device 30 for displaying. The user may set the basic project data of the assessment project through the electronic device 30. In addition to the industry category, the basic project data further includes a company name, a factory type, a company location, the assessment year, provisions of assessment, IPCC GWP version, the year of selecting a power factor, inspection unit, etc..

[0015] Step S12: Select one of the questionnaires corresponding to the industry category from the predetermined emission source identification questionnaires of the questionnaire database 22 according to the industry category of the basic project data so as to form an emission source identification questionnaire, the emission source identification questionnaire including a plurality of options and the options corresponding to a plurality of emission sources respectively; and provide a selection interface of the emission source identification questionnaire for a user to select a plurality of the options to form a plurality of selected

options.

[0016] In this embodiment, the server 10 obtains the industry category in the basic project data, and selects a corresponding one from the questionnaire database 22 according to the industry category. The selected predetermined emission source identification questionnaire forms the emission source identification questionnaire. Taking the industry category of the cement industry as an example, the selection interface 60 of the emission source identification questionnaire 50 is shown in FIG. 3. The selection interface 60 is transferred to the electronic device 30, displayed on the screen and presented in an electronic questionnaire, for the user to select multiple options 50a, where each option is a question related to one emission source. The user may select the options 50a, for example, by checking boxes, and the selected options are formed after the options 50a are checked. The user may input a self-defined emission source name of each of the selected options on the selection interface 60, for the purpose of recognizing the emission source of each of the selected options by the user in subsequent steps. Furthermore, each of the options 50a of the emission source identification questionnaire corresponds to an emission type of each of the emission sources. The above emission type may be, for example, stationary, mobile, process, fugitive, or outsourced electricity.

[0017] The options 50a of the emission source identification questionnaire 50 described above is illustrative by examples of options of Category 1 (direct greenhouse gas emission) and Category 2 (indirect greenhouse gas emission caused by input energy). That is, the emission source identification questionnaire 50 at least includes a direct greenhouse gas emission questionnaire 52 and a questionnaire 54 about indirect

greenhouse gas emission caused by input energy, where the emission sources corresponding to the multiple options 50a of the direct greenhouse gas emission questionnaire 52 belong to a plurality of emission sources of direct greenhouse gas emission, and the emission sources corresponding to the multiple options 50a of the questionnaire 54 about indirect greenhouse gas emission caused by input energy belong to a plurality of emission sources of indirect greenhouse gas emission caused by input energy.

[0018] The options 50a of the emission source identification questionnaire 50 may further include options of Category 3 (indirect greenhouse gas emission caused by transportation), Category 4 (indirect greenhouse gas emission caused by the use of products by the organization), Category 5 (indirect greenhouse gas emission caused by the use of products from the organization), Category 6 (indirect greenhouse gas emission caused by other sources). That is, the emission source identification questionnaire 50 may further include a questionnaire of indirect greenhouse gas emission caused by transportation, a questionnaire of indirect greenhouse gas emission caused by the use of products by the organization, a questionnaire of indirect greenhouse gas emission caused by the use of products from the organization, a questionnaire of indirect greenhouse gas emission caused by other sources.

[0019] Furthermore, in this embodiment, the server 10 may further provide a significant indirect emission source rating scale and an indirect emission source evaluation table for the user to set the content of the significant indirect emission source rating scale and the indirect emission source evaluation table by connecting to an electronic device 30.

[0020] Step S13: Generate an identification result 70 according to the selected options selected by the user, the identification result 70 including

multiple emission sources corresponding to the selected options.

[0021] Since each of the options 50a corresponds to one emission source, the server 10 can determine the corresponding emission source according to the selected options in the emission source identification questionnaire 50, and generate the identification result (referring to FIG. 4). The identification result 70 further includes each of the self-defined emission source names corresponding to each of the emission sources.

[0022] By the above Steps S11-S13, since the emission source identification questionnaire 50 already has various emission sources that may be used by the industry category and is presented to the user in an electronic questionnaire, the user can select the options 50a in the emission source identification questionnaire 50 corresponding to the industry category so as to form the selected options, thereby assisting the user in identifying emission sources used by the enterprise or organization, and improving the efficiency of assessing greenhouse gases by the user.

[0023] After the emission source is identified, the method for assessing greenhouse gases in this embodiment may further include the following steps:

Step S14: Provide an input interface for the user to input activity data of each of the emission sources in the identification result 70 so as to form an emission source inventory, the emission source inventory including the multiple emission sources in the identification result 70 and the activity data of each of the emission sources.

[0024] In this embodiment, the input interface 80 (referring to FIG. 5) is transferred to the electronic device 30 by the server 10, and displayed on the screen. The user inputs activity data of the emission sources through the electronic device 30 to form the emission source inventory 82 shown

in FIG.5. The activity data may be, for example, activity data of the whole assessment year, but is not limited thereto, or may also be activity data of a half year, a quarter, or a month. The emission source inventory 82 further includes each of the self-defined emission source names corresponding to each of the emission sources. The user may recognize the emission source through the self-defined emission source name when inputting the activity data, thereby avoiding input errors.

[0025] Step S15: Obtain an emission factor of a greenhouse gas corresponding to each of the emission sources from the emission factor database 24 according to the emission sources in the emission source inventory 82.

[0026] In this embodiment, the server 10 obtains the greenhouse gas and the emission factor corresponding to each of the emission sources from the emission factor database 24 according to the emission source and the emission type in the emission source inventory 82 (referring to FIG. 6).

[0027] Step S16: Calculate an emission quantity of greenhouse gases corresponding to each of the emission sources according to the activity data and the emission factor of each of the emission sources in the emission source inventory 82.

[0028] In this embodiment, the server 10 calculates the emission quantity of greenhouse gases from each of the emission sources according to the activity data and the emission factor in the emission source inventory 82 (referring to FIG. 7). The server 10 calculates the carbon dioxide equivalent (CO₂e) of each of the emission sources, carbon dioxide emission equivalent of Category 1 (direct greenhouse gas emission), carbon dioxide emission equivalent of Category 2 (indirect greenhouse gas

emission caused by input energy) according to GWP. The server may also calculate the carbon dioxide emission equivalent of Categories 3-6, and the total carbon dioxide emission equivalent of Categories 1-6.

[0029] By the above Steps S14-S16, the activity data of each of the identified emission sources and the emission factor of each of the emission sources can be obtained, and the emission factor of greenhouse gases from each of the emission sources can be calculated.

[0030] Furthermore, Step S16 in this embodiment further includes:

the server 10 obtains an assessment inventory template from an assessment inventory template database.

[0031] In this embodiment, the database 20 includes the assessment inventory template database 26, and the assessment inventory stores a plurality of predetermined assessment inventory templates. Each of the predetermined assessment inventory templates corresponds to a kind of provision of assessment, such as the provision of assessment of ISO 14064-1:2018 or ISO 14064-1:2006. The provision of ISO 14064-1:2006 comprises classification 1, 2, and 3, where classification 1 corresponds to category 1 of ISO 14064-1:2018, classification 2 corresponds to category 2 of ISO 14064-1:2018, and classification 3 corresponds to categories 3 to 6 of ISO 14064-1:2018. The server 10 obtains the corresponding predetermined assessment inventory template from the assessment inventory template database 26 according to the provisions of the basic project data in Step S11 so as to form the assessment template.

[0032] The server 10 generates an assessment inventory of the assessment project according to the emission source inventory 82, the emission quantity of greenhouse gases from each of the emission sources, and the assessment inventory template. Therefore, the assessment

inventory generated by the server 10 corresponds to the provisions of the basic project data.

[0033] Further, an assessment report may be generated according to the assessment inventory. For example, the server 10 may further provide another input interface to be transferred to the electronic device 30, allowing the user to input the basic data of the company through the another input interface, so that the server 10 can generate the assessment report of the basic data of the company. Therefore, the user's time in transcribing the assessment report can be effectively saved.

[0034] The assessment inventory and the assessment report of the assessment project may be stored in the database 20, for the subsequent query and utilization. In one embodiment, the server 10 may also generate uncertainty evaluation results and evaluation results of data quality management from the assessment inventory.

[0035] The above is a description of generating an assessment inventory and an assessment report for a single assessment project. The same user or different users of the same enterprise or organization may establish an individual assessment project for the enterprise's branch offices or different factory areas through the system 1 for assessing greenhouse gases so as to generate the assessment inventory and the assessment report corresponding to the assessment project and integrate the assessment inventories of multiple assessment projects into one assessment inventory, which is further described below.

[0036] The same user or different users may connect to the server 10 through the electronic device 30, allowing the system 1 for assessing greenhouse gases to repeat the above Step S11 to Step S16 for a plurality of times, thereby generating the plurality of assessment inventories of the

plurality of assessment projects.

[0037] A plurality of assessment projects are selected to form a project group. The user connects to the server 10 through an electronic device 30 and selects multiple assessment projects for the same enterprise or organization. The server 10 organizes the selected assessment project groups into one project group.

[0038] The server 10 compiles the assessment inventories of the multiple assessment projects in the project group so as to form an integrated information interface 90 (referring to FIG. 8). The integrated information interface 90 includes a total carbon dioxide emission equivalent of the assessment projects in the project group and an individual total carbon dioxide emission equivalent of each of the assessment projects. The integrated information interface 90 may display the above total emission equivalent and/or the individual total emission equivalent with text and/or charts. Therefore, an overall information overview of the assessment of greenhouse gases for different branch offices or different factory areas in the same enterprise or organization is provided to the user.

[0039] The above is only the preferred and feasible embodiment of the present invention, and all equivalent changes made by applying the specification of the present invention and the claims should be included in the patent scope of the present invention.

WHAT IS CLAIMED IS:

1. A method for assessing greenhouse gases, implemented by a system for assessing greenhouse gases, and comprising the following steps:

A. setting basic project data of an assessment project, the basic project data comprising an industry category;

B. selecting one of the questionnaires corresponding to the industry category from a plurality of predetermined emission source identification questionnaires of a questionnaire database according to the industry category of the basic project data so as to form an emission source identification questionnaire, the emission source identification questionnaire comprising a plurality of options and the options corresponding to a plurality of emission sources, respectively, and providing a selection interface of the emission source identification questionnaire for a user to select multiple options so as to form a plurality of selected options; and

C. generating an identification result according to the selected options selected by the user, the identification result comprising the multiple emission sources corresponding to the selected options.

2. The method for assessing greenhouse gases of claim 1, after Step C, the method further comprising:

D. providing an input interface for the user to input activity data of each of the emission sources in the identification result so as to form an emission source inventory, the emission source inventory comprising the multiple emission sources in the identification result and the activity data of each of the emission sources;

E. obtaining an emission factor of a greenhouse gas corresponding to each of the emission sources from an emission factor database according to

the emission sources in the emission source inventory; and

F. calculating an emission quantity of the greenhouse gas corresponding to each of the emission sources according to the activity data and the emission factor of each of the emission sources in the emission source inventory.

3. The method for assessing greenhouse gases of claim 2, wherein in step E, each emission factor corresponding to each of the emission sources is obtained from the emission factor database according to each of the emission sources and an emission type of each of the emission sources.

4. The method for assessing greenhouse gases of claim 3, wherein in Step B, each of the options of the emission source identification questionnaire corresponds to the emission type of each of the emission sources.

5. The method for assessing greenhouse gases of claim 2, wherein Step F comprises:

obtaining an assessment inventory template from an assessment inventory template database; and

generating an assessment inventory of the assessment project according to the emission source inventory, the emission quantity of greenhouse gases from each of the emission sources, and the assessment inventory template.

6. The method for assessing greenhouse gases of claim 5, wherein Step F comprises:

generating an assessment report according to the assessment inventory.

7. The method for assessing greenhouse gases of claim 5, after Step F, the method further comprising: repeating Step A-Step F for a plurality of times so as to generate the plurality of assessment inventories of the plurality of

assessment projects;

selecting a plurality of the assessment projects to form a project group; and

compiling the assessment inventories of the multiple assessment projects in the project group to form an integrated information interface, the integrated information interface comprising a total carbon dioxide emission equivalent of the assessment projects in the project group and an individual total carbon dioxide emission equivalent of each of the assessment projects.

8. The method for assessing greenhouse gases of claim 2, wherein in Step B, the emission source identification questionnaire comprises a direct greenhouse gas emission questionnaire and a questionnaire of indirect greenhouse gas emission caused by input energy, the emission sources corresponding to the multiple options of the direct greenhouse gas emission questionnaire belonging to a plurality of emission sources of direct greenhouse gas emission, and the emission sources corresponding to the multiple options of the questionnaire of indirect greenhouse gas emission caused by input energy belonging to a plurality of emission sources of indirect greenhouse gas emission caused by input energy.

9. The method for assessing greenhouse gases of claim 2, wherein Step B comprises: setting a self-defined emission source name for each of the selected options; in Step C, the identification result comprises each self-defined emission source name corresponding to each of the emission sources; and in Step D, the emission source inventory comprises each self-defined emission source name corresponding to each of the emission sources.