L.1420: Methodologies for Assessment of Environmental Impacts of ICT in Organizations

ITU-T SG 5 : "Environment and Climate Change"

Geneva, April 2012 – gilbert.buty@alcatel-lucent.com

International Telecommunication Union

What is L.1420 ? What is it for?

- It is a Recommendation providing guidance on how to assess environmental impacts of ICT in organizations.

    - It has been built with a large number of representatives from the ICT sector and governments. It deals with energy consumption and GHG emissions.

    - It is in line with widely used international voluntary measuring and reporting schemes.

        - It complements ISO 14064-1 and the GHG Protocol.

- This Recommendation covers:

    - The assessment of the life cycle environmental impact of ICT Goods, Networks and Services used by an organization ("Non-ICT organizations")

    - The assessment of the environmental impact of an ICT organization ("ICT organizations")

    - The reporting of these impacts to ensure fair and transparent communications

Scope

- The assessment of the environmental impact of an ICT organization.

  – An ICT organization is an organization, the core activity of which is directly related to the design, production, promotion, sales or maintenance of ICT goods, networks or services.

- The assessment of the life cycle environmental impact of ICT Goods, Networks and Services used by an non-ICT organization .

  – Other organizations

- The interpretation of these impacts and their fair and transparent reporting

  – Documentation is required

- This Recommendation does not address GHG removals or rebound effects

  – GHG removals for ICTs is not the highest priority

  – Rebound effects are still under study

Scope

- The Recommendation covers the 3 scopes:
  - Scope 1 (Direct emissions): Activities owned or controlled by your organization that release emissions straight into the atmosphere.
    - Examples of scope 1 emissions include emissions from combustion in owned or controlled boilers, furnaces, vehicles.
  - Scope 2 (Energy indirect): Emissions being released into the atmosphere associated with your consumption of purchased electricity, heat, steam and cooling.
    - These are indirect emissions that are a consequence of your organisation's activities but which occur at sources you do not own or control.
  - Scope 3 (Other indirect): Emissions that are a consequence of your actions, which occur at sources which you do not own or control and which are not classed as scope 2 emissions.
    - Examples of scope 3 emissions are business travel by means not owned or controlled by your organization, waste disposal, or purchased materials or fuels.
- Assessment and reporting for scope 1 and scope 2 emissions are mandatory.
- Assessment and reporting for scope 3 emissions are optional

Scope 1

- It relates to the direct GHG emissions generated by facilities within its organizational boundaries.

- Direct GHG emissions are principally the result of the following types of activities undertaken by the company:

  - Physical or chemical processing. Most of these emissions result from manufacture or processing of chemicals. It should be noted that this is applicable to ICT to a limited extent.

  - Transportation of materials, products, waste and employees. These emissions result from the combustion of fuels in company owned/controlled mobile combustion sources.

  - Fugitive emissions. These emissions result from intentional or unintentional releases such as SF_6, equipment leaks from joints, seals, packing, and gaskets during the use of refrigeration and air conditioning equipment, e.g. air conditioning for data centers and making wafers.

  - Combustion of fuels e.g. for power supply back-up of ICT goods and cooling of ICT goods.

Scope 2

- Scope 2 accounts for GHG emissions from the generation of purchased electricity consumed by the company.

- Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company.

  – For many companies, this represents one of the largest sources of GHG emissions

  – If the organization does not own the electricity lines, TD losses are not part of scope 2

  – Purchase of electricity for sale to end-user are not in scope 2.

Non-ICT and ICT Organizations

Scope 3

- Scope 3 emissions are all of the indirect emissions that result from a company's activities that are not Scope 2 emissions.

- They represent emissions that occur in the life-cycle steps of a product or process that occur before the company's activities, such as those resulting from the production and transport of raw materials.

- They also represent emissions that occur in the life-cycle steps of a product after a company's activities, such as from the transportation and use of products, as well as the disposal of waste materials.

- Trends in product use emissions must be interpreted carefully

  – It could be hard to figure out a realistic way of accounting for the product use

  – Not necessarily reflects the efforts made by the organization in reducing its footprint

- If an organization chooses to assess scope 3 GHG emissions, Appendix I in the Recommendation lists categories that should be taken into account by the organization when claiming compliance with this Recommendation.

Principles

- Relevance

  - Select GHG sources, data and methods appropriate to the assessment of the GHG emissions of ICT activities and organizations.

- Completeness

  - Include all specified GHG emissions that provide a material contribution to the assessment of GHG emissions arising from products.

- Consistency

  - Enable meaningful comparisons in GHG-related information.

- Accuracy

  - Reduce bias and uncertainties as far as practicable.

- Transparency

  - The organization shall disclose the information sufficiently to allow a third party to make decisions with confidence.

Relevance

- This means that it contains the information that report users—both external and internal to the organization—consider significant and need for their decision-making.

- The selection of reporting boundaries for GHG emissions is an important aspect of relevance.

  - The accounting and reporting boundaries should appropriately reflect the GHG emissions of the organization.

  - The choice of appropriate boundaries depends on the characteristics of the organization, the intended purpose of the GHG information, and the needs of the users.

    - organizational structures and operational boundaries

    - The business context

    - Specific exclusions or inclusions, which should be transparently identified and the rationale provided.

- The boundaries should represent the substance and economic reality of the business, and not merely its legal form.

Completeness

- All emissions within the chosen organizational and operational boundaries that are material to users should be reported to allow the reporting organization's emissions to be assessed.

- In practice, a lack of data or the cost of gathering data may be a limiting factor in the completeness of the inventory.

  – When emissions have not been estimated, or have been estimated at an insufficient level of quality to be included, the potential impacts and relevancy of the exclusion should be transparently documented and explained.

- The principle of completeness is not contradicting the possible exclusion of negligible emissions.

  – L.1420 allows their exclusion if an explanation is given as to why they are excluded.

  – if the totals of emissions that are excluded are not considered significant by the users of the reported information, this should not be considered to be in violation of the principle of completeness.

Non-ICT and ICT Organizations

Consistency

- Users of the report (and the organization itself!) may want to track and compare GHG emissions information over time in order to identify trends and to assess the performance of the reporting organization.

    - The consistent application of boundary definitions, accounting practices and calculation methodologies over time is essential for the production of comparable GHG emissions data.

    - The GHG information for all facilities within an organization's reporting boundary must be compiled in a manner that ensures that the aggregate information is internally consistent and consistent over time.

    - If there are changes in the scope, methods, data or any other factors affecting emission estimates, they should be transparently documented and justified.

Accuracy

- As a means of promoting credibility in their reported emissions, organizations should ensure accuracy in their emissions estimation process.

- Data should be sufficiently accurate and precise to enable intended users to make decisions with confidence.

  – Because the intended uses of inventory data vary, the necessary level of accuracy will also vary.

  – Organizations should ensure that GHG measurements, estimates or calculations are systemically neither over nor under the true emissions value, as far as practicable.

- Need to balance the cost-effectiveness of obtaining accurate emissions estimates with the intended use for the emissions information.

Transparency

- Transparency relates to the degree to which information on the processes, procedures, assumptions and limitations of the GHG inventory are disclosed.

- A transparent report will provide a clear understanding of the issues in the context of the reporting company, and a meaningful assessment of performance.

    – Information should be reported in a clear, understandable, factual, neutral and coherent manner.

    – Any changes to the data, methods or other factors affecting a time series of reported emissions should be transparently documented.

    – Information on internal audits or external third-party reviews should be included with the report.

    – Information should be recorded, compiled and analyzed in a way that enables internal reviewers and external verifiers to attest to its credibility.

Structure of ITU-T L 1420

- Evaluation of energy consumption and GHG impact in Non-ICT Organizations

- Setting the Organizational boundary

- Setting the Operational boundary

- Selection of quantification methodology

- Annual assessment/Establishment of a base year

- Recalculation of energy and GHG inventory (restatements)

- Uncertainties

- Reporting

Evaluation of energy consumption and GHG impact in Non-ICT Organizations

- The methodology covers the use of ICT in any kind of organization, including but not limited to organizations such as banks, insurance companies and public administrations.

- The evaluation of the life cycle energy consumption and GHG impact when using ICT in organizations should be based

    - on the Recommendation ITU-T L.1410 Part I and

    - aggregated to an organizational level according to the principles outlined in this Recommendation.

- In a nutshell, you isolate your ICT-related activities from the rest of your business!

Evaluation of energy consumption and GHG impact in ICT Organizations

- The guidance sets out broad general principles for how to measure and report GHG emissions and energy consumption.

- The organization must calculate emissions from all scopes 1 & 2 sources of emissions that result directly from its business operations.

- The evaluation of the life cycle energy consumption and GHG impact should be aggregated to an organizational level according to the principles outlined in this Recommendation.

Setting the Organizational boundary

- The organizational boundaries should include all operations and subsidiaries used by the organization according to the consolidation approach

  – The equity share approach – under which a company accounts for GHG emissions from operations according to its interest in the operation.

  – The control approach – under which a company accounts for 100% of the GHG emissions from operations over which it has control. Control can be defined in either operational or financial terms.

    - The operational control approach – a company has operational control over an operation if the company or one of its subsidiaries has the full authority to introduce and implement its operating policies at the operation.

    - The financial control approach – a company has financial control over an operation if the company has the ability to direct the financial and operating policies of the operation with a view to gaining economic benefits from its activities.

- The Recommendation does not mandate any particular approach BUT the chosen approach shall be the only applied approach.

Equity Share Approach

- Accounting for GHG emissions based on equity share is appropriate for:

  – Liability and risk management.

    - GHG emissions accounting and reporting based on equity share provides a more representative and complete picture.

    - Therefore, it provides a realistic picture of liabilities and risks to management, employees, shareholders.

  – Situations where greater resources are available for conducting the inventory.

    - Reporting on the basis of equity share requires companies to obtain information from other parties for operations they do not control.

      – If this is not possible, they may need to estimate emissions from similar operations for which they have data.

    - In either case, costs may be expected to be greater than for calculating emissions from sources under their operational control.

Operational Control Approach

- Reporting based on the operational control approach is appropriate for:

  - Performance tracking. Having operational control suggests a greater degree of influence than merely holding a share of the equity.

  - Situations where resources for inventorying emissions are limited.

    - Reporting on the basis of operational control can be expected to be less costly than reporting on the basis of equity share because the reporting company will, by definition, have ready access to the data needed to estimate emissions.

Financial Control Approach

- Reporting based on the financial control approach is appropriate for alignment with financial accounting.

    - Similarly to the equity share approach, the financial control approach results in closer alignment between GHG accounting and financial accounting.

    - It should be noted that the financial control boundary does not include some arrangements that can be common in some industrial sectors.

        - Petroleum sector

Setting the Operational boundary

- Identify emissions related to…
    - design, production and use of ICT goods and associated support equipment present in the organization.
    - design and production of ICT associated consumables present in the organization.
    - software and ICT services purchased by the organization concerned.
    - disposal of all ICT goods present in the organization, disposal of consumables (e.g. worn cartridges or waste paper) and end of life associated with software and ICT services purchased by the organization.
- Data ordinarily comes from invoices and/or estimated energy usage and applied emission factors
- A list of ICTs is given in the Recommendation

List of ICTs to be considered

- Desktops;
- Laptops;
- Cathode Ray Tube (CRT) screens;
- Flat screens;
- Individual printers;
- Cables;
- Network printers and copiers;
- Servers, switches and routers;
- Fax machines;
- Scanners;
- Fixed phones;
- Mobile phones;
- Personal Digital Assistants (PDA) and tablets;
- Projectors;
- Videoconference installations;
- Televisions;
- Cooling systems for ICT goods;
- Other small ICT goods;
- Outsourced ICT goods, in particular outsourced datacenters;
- ICT-Dedicated Power supply back-up generators.

Setting the Operational boundary

- Emission sources including the following activities (in scope 3) may also be considered:
  - daily commute to work and business travel of Information Technology (IT) department staff.
  - freight of purchased ICT goods entering the organization.
  - freight of ICT goods within the organization premises.
  - and freight of ICT goods leaving the organization's premises when decommissioned.

- Data ordinarily comes from invoices, reports for corporate reimbursement activities, estimated energy usage and applied emission factors…

- For each of the three scopes (if all covered) the selected emission sources shall be clearly described and documented.

Setting the Operational boundary

- Establishing operational boundaries involves

  – identifying GHG emissions and energy consumption associated with the organization's activities

  – Categorizing them as direct or indirect

  – Assigning the appropriate scope for accounting and reporting

- Not always an easy task!!

Selection of quantification methodology

- Selection or development of GHG emission factors
- Calculation of GHG emissions as under
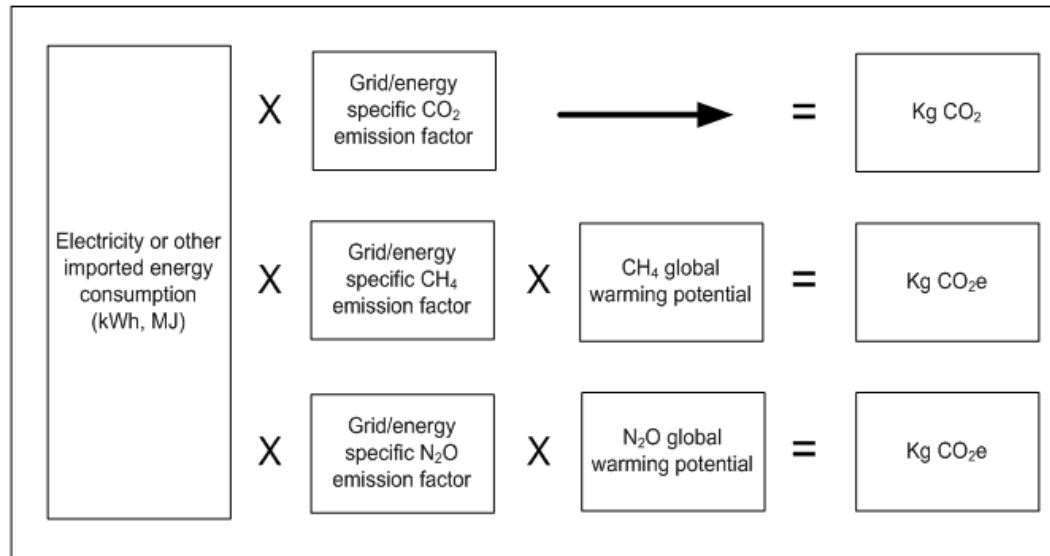
GWP factors for GHG taken from IPCC Time frame of 100 years

Emission factors

- According to L.1420, the organization shall select or develop emission factors that :

  – are derived from a recognized origin,

  – are appropriate for the GHG source concerned,

  – are valid at the time of quantification,

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

  – are consistent with the intended use of the GHG inventory.

- Except for GWP factors, no strict recommendations are made

  – A lot of emission factors databases exist

    - National : ADEME, DEFRA, US EPA

    - International : IEA (International Energy Agency)

  – May be a need for improvement, since companies will choose their own emission factors sources, making comparisons relatively difficult and result consistency challengeable

Data Collection

- Identify the relevant GHG activity data required under chosen GHG quantification methodology.

- Extract the data which is further required for GHG emission quantification.
    - Facility usage rates of electricity, fossil fuels, purchased steam and chilled water are obtained from invoices supplied by the service provider.
    - Mobile fleet usage is tracked via the corporate fueling card account program
    - Aircraft usage is tracked by the corporate travel agency
    - Employee personnel vehicle usage during business travel is tracked via corporate reimbursement activities.

- Put in place a data collection quality assurance!

- Define a document retention and control policy
    - What do you do with data in electronic form?
    - Disclosure policy to be set up

Annual assessment / Establishment of a base year

- Assessments shall be carried out on an annual basis with the date of publication of L.1420 as a reference.

- However, a different base year could be chosen when:

  - The organization estimates that the quantity and/or quality of available verifiable data for this particular different year would guarantee a more accurate evaluation of its GHG emissions and energy consumption.

  - The organization has already put in place an assessment and reporting process based on a different base year, compliant with this Recommendation.

  - The activities carried out by the organization generate unusual fluctuations of GHG emissions and/or energy consumption in such a way that the base year might not be significant.

- Any choice of a different base year shall be documented

Non-ICT and ICT Organizations

Recalculation of energy and GHG inventory

- Applies under 2 circumstances:

  - Structural changes which include mergers, acquisitions and divestments and/or outsourcing or in-sourcing of GHG emitting activities.

  - Discovery of significant errors contained within the base year emission calculations which can necessitate a change in the emissions inventory.

- L.1420 makes no recommendations as to what constitutes a "significant" change and thus the need to adjust base year emissions

- Organization may define a "significance threshold" requiring a recalculation

  - If a modification in the organization perimeter (or discovery of errors) could result in 5% cumulative change in total GHG emissions.

Non-ICT and ICT Organizations

Uncertainties

- An uncertainty assessment for GHG emissions and energy consumption should be performed in accordance with ISO 14064-1 clause 5.4 to the extent needed to understand the inventory results.

    – It is part of a broader learning and quality process

- There are several type of uncertainties associated with GHG inventories (scientific, estimation, parameter, model, statistical, systematic).

- Analyzing and quantifying some uncertainty aspects are extremely difficult and likely beyond the scope of most organization's inventory efforts

- At present, there is no precise guidance on how to address all uncertainty related issues

Reporting

- The energy and GHG report content should contain:

    - A description of the reporting organization and the person responsible the reporting period or periods covered
    - Documentation of organizational boundaries and operational boundaries
    - A description of the quantification methodologies used within the framework of the study
    - The principles for collection of energy data, GHG activity data and emission factors
    - The results of the uncertainty assessment for GHG emissions and energy consumption performed according to ISO 14064-1
    - The results of energy consumption assessment and GHG emissions assessment
    - Any recalculations including corrections of the corresponding clauses of the previous report(s).
    - A statement that the energy report and the GHG inventory report has been prepared in accordance with the principles outlined in the Recommendation.

Conclusions

- This Recommendation is intending to help organizations to assess their GHG emissions and energy consumption

- This Recommendation is the unique standard (e.g. provided by an official SDO) in this domain.

- Nothing incredibly original – looks a lot like the GHG Protocol
  - Main objective is to unify the various assessment methods, not to re-create the wheel

- Several companies is in the act of checking the delta with their current process
  - Do we expect any big deviations ?

- Will certainly need improvements
  - Nobody is perfect
  - Sources of Emission factors
  - Too complicated? Too flexible? Too rigid?
  - ….

- Any feedbacks from other ITU Members and/or other stakeholders are welcome and will improve the L.1420 Recommendation.

Thanks for your attention