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SERIES L: ENVIRONMENT AND ICTS, CLIMATE CHANGE, E-WASTE, ENERGY EFFICIENCY; CONSTRUCTION, INSTALLATION AND PROTECTION OF CABLES AND OTHER ELEMENTS OF OUTSIDE PLANT

Connect 2020 greenhouse gases emissions – Guidelines

Recommendation ITU-T L.1460

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ENVIRONMENT AND ICTS, CLIMATE CHANGE, E-WASTE, ENERGY EFFICIENCY; CONSTRUCTION, INSTALLATION AND PROTECTION OF CABLES AND OTHER ELEMENTS OF OUTSIDE PLANT

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Recommendation ITU-T L.1460

Connect 2020 greenhouse gases emissions – Guidelines

Summary

Recommendation ITU-T L.1460 provides guidelines to address the Connect 2020 greenhouse gas (GHG) emissions target. It is intended to be utilized by relevant stakeholders to address the Connect 2020 ambitions, while considering the sustainable development goal (SDG) 13 and the objectives of the Paris Agreement.

It also presents examples of actions taken in order to limit the GHG emissions in the information and communication technology (ICT) sector.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
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Keywords

Connect 2020, GHG emissions, ICT sector, Paris agreement, SDG 13 goal.

* To access the Recommendation, type the URL http://handle.itu.int/ in the address field of your web browser, followed by the Recommendation's unique ID. For example, http://handle.itu.int/11.1002/1000/11830-en.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

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Introduction

The United Nations Framework Convention on Climate Change (UNFCCC), entered into force in 1994, with the ultimate objective to stabilize greenhouse gas concentrations at a level that would prevent dangerous anthropogenic interference with the climate system. Since then, the Parties to the Convention have been negotiating protocols and agreements in order to set objectives and implement actions aimed at reaching the Convention's objective.

The UNFCCC provides access to data on national greenhouse gas (GHG) emissions and removals, both by countries that are Parties to the Climate Change Convention, and by various organizations that also collect, estimate and/or disseminate data on GHG emissions/removals.

In 2014 the ITU Plenipotentiary Conference met in Busan (South Korea) and there agreed on Resolution 200 (Busan, 2014) on the Connect 2020 Agenda. (see: https://www.itu.int/en/connect2020/Pages/default.aspx)

The Connect 2020 is a global initiative that, in its Target 3.3, indicates that the GHG generated by the telecommunication/information and communication technology (ICT) sector are to be decreased per device by 30% by 2020, compared to a baseline year to be defined.

Then, the United Nations adopted, in September 2015, the 2030 Agenda for Sustainable Development, which came into force in January 2016. This Agenda is composed of 17 sustainable development goals (SDGs) with their corresponding targets.

Particularly, SDG 13 aims to take urgent action to combat climate change and its impacts. Taking into consideration that global emissions of carbon dioxide (CO2) have increased by almost 50 per cent since 1990, and that emissions grew more quickly between 2000 and 2010 than in each of the three previous decades, UN calls for action by using a wide array of technological measures and changes in behaviour, to limit the increase in global mean temperature to 2°C above pre-industrial levels.

Furthermore, the Paris Agreement, that entered into force on November 4, 2016, agreed to keep a global temperature rise in 2100 2°C, or if possible less, above preindustrial levels.

In this regard, private investors are more and more demanding about the GHG strategy of companies and the environmental impact of their activity. So, more and more companies are taking commitments to reduce their GHG emissions.

At the same time, the expanding ICT sector, although relatively lean in terms of GHG emissions compared to many other sectors, is often expected to increase its GHG emissions. However, studies for some countries have actually reported an initial decoupling.

Activities are being carried out to speed-up the implementation of the Paris Agreement and to involve the business sector. Among them is the Science Based Targets Initiative (SBTi). A joint initiative by CDP, UN Global Compact, WRI and WWF that aims to get organizations to take on ambitious, voluntary targets aiming towards a 2°C (or lower) trajectory.

In the frame of the SBTi sectoral methodologies have been developed, but not for the ICT sector.

Still, representing a significant part of the overall GHG emissions, it is crucial for the ICT sector to define how it could comply towards a 2°C (or lower) trajectory. For this reason, ITU-T has developed a specific methodology for the ICT sector, available in ITU-T L.1450.

Recommendation ITU-T L.1450 provides steps to be considered:

STEP 1: to calculate the ICT sector footprint with respect to lifecycle GHG emissions.

STEP 2: to define a 2°C, or possibly lower, trajectory for the ICT sector.

Recommendation ITU-T L.1460

Connect 2020 greenhouse gases emissions – Guidelines

1 Scope

This Recommendation provides guidelines to address the Connect 2020 greenhouse gas (GHG) emissions target.

This Recommendation is intended to be utilized by relevant stakeholders to address the Connect 2020 ambitions, while considering the SDG 13 goal and the objectives of the Paris Agreement.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T L.1400] Recommendation ITU-T L.1400 (2011), *Overview and general principles of methodologies for assessing the environmental impact of information and communication technologies*.

[ITU-T L.1410] Recommendation ITU-T L.1410 (2014), *Methodology for environmental life cycle assessments of information and communication technology goods, networks and services*.

[ITU-T L.1420] Recommendation ITU-T L.1420 (2012), *Methodology for energy consumption and greenhouse gas emissions impact assessment of information and communication technologies in organizations*.

[ITU-T L.1430] Recommendation ITU-T L.1430 (2013), *Methodology for assessment of the environmental impact of information and communication technology greenhouse gas and energy projects*.

[ITU-T L.1440] Recommendation ITU-T L.1440 (2015), *Methodology for environmental impact assessment of information and communication technologies at city level*.

[ITU-T L.1450] Recommendation ITU-T L.1450 (2018), *Methodologies for the assessment of the environmental impact of the information and communication technology sector*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 carbon budget [b-SBT method]: The estimated amount of carbon (or CO_2) the world can emit before warming will exceed specific temperature thresholds.

3.1.2 emissions scenario [b-SBT method]: A forecast of future emissions and atmospheric GHG concentrations, used to assess the impact of socioeconomic changes on future emissions.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

GHG Greenhouse Gas

ICT Information and Communication Technology

SDG Sustainable Development Goal

5 Conventions

In this Recommendation:

The expressions "is required" and "shall" indicate a requirement which must be strictly followed and from which no deviation is permitted if *full compliance* to this Recommendation is to be claimed.

The expressions "is recommended" and "should" indicate a requirement which is recommended but which is not absolutely required. Thus, this requirement need not be present to claim compliance with this Recommendation.

The expressions "can optionally" and "may" indicates an optional requirement which is permissible, without implying any sense of being recommended. This term is not intended to imply that the vendor's implementation must provide the option and the feature can be optionally enabled by the network operator/service provider. Rather, it means the vendor may optionally provide the feature and still claim conformance with this Recommendation.

In all cases the fundamental lifecycle assessment (LCA) principles of *relevance, completeness, consistency, accuracy and transparency* shall guide the practitioner.

6 Principles

The following principles shall be taken into consideration when estimating the lifecycle greenhouse gas (GHG) emissions of the information and communication technology (ICT) sector:

– **relevance**: Select data and methods appropriate to the assessment of the ICT sector footprint.

– **completeness**: Include all subsectors/elements that provide a material contribution to the overall results. All elements/subsectors covered shall be included in the results.

– **consistency**: Enable meaningful analysis regarding the development of results over time by using the same method and data sources, or recalculating, when deriving ICT sector footprint and contextual factors with regard to technological, economic factors.

– **accuracy**: Reduce bias and uncertainties as much as practicable.

– **transparency**: When communicating results, organizations shall give sufficient information to support the interpretation of the results. This means that data sources, data collection process as well as the modelling and the assumptions made must be clearly stated and motivated in the documentation, as well as all the ICT sector boundaries and cut-offs.

7 Methodologies to assess the ICT sector impact on GHG emissions

The following methodologies are recommended to address the Connect 2020 GHG emissions target.

In order to assess the ICT sector footprint with respect to lifecycle GHG emissions, the methodology described in [ITU-T L.1450] on "Methodologies for the assessment of the environmental impact of the information and communication technology sector", Part I, shall be used.

[ITU-T L.1450] defines the methodology needed to calculate the ICT sector footprint with respect to lifecycle GHG emissions considering, for example, the volume of activity, energy consumption and embodied emissions related to product lifecycle. Even though, the division per devices can be performed by dividing the global ICT sector footprint by an estimated number of total ICT devices, this causes serious methodological difficulties and such an assessment is not recommended.

Understanding the GHG emissions of the ICT sector is a complex task that involves a significant amount of data collection from many different sources, as well as modelling and extrapolations, as there is no condensed and complete data set available. The assessment procedure typically combines top-down approaches and complementing bottom-up data. For example, data for shipments will typically rely on sales statistics, while individual footprints of goods would more often be modelled based on available GHG emissions estimates. Generally, there is a balance between data collection efforts and available time and resources. In any case, it is appropriate to start from a sector level and apply assumptions and modelling techniques to estimate the total footprint of the ICT sector.

[ITU-T L.1450] also gives guidance on how to assess the ICT sector footprint at a country or a group of countries level. [ITU-T L.1450] covers only first order effects. The methodology on second order effects, including positive ones, at a sector level will be presented in another Recommendation currently under preparation.

In order to define a GHG emissions 2°C (or possibly lower) trajectory for the ICT sector, Part II of [ITU-T L.1450] shall be used.

For telecom operators, GHG emissions may also be assessed at a company level relatively to the number of customers or to the number of customer-usages, the number of customer-usages being the number of customers corresponding to different kinds of usages such as voice or data.

8 Examples of actions to be taken that limit the GHG emissions in the ICT sector

In order to limit GHG emissions at the ICT sector level, actions shall be taken globally within a large range of areas, including for instance:

1) Actions to improve the energy efficiency of ICT goods, networks and services from a full-lifecycle point of view, with activities such as:

– developing free cooling for the operation of data centres;

– developing consolidation and virtualization of servers;

– developing the usage of equipment adapting their energy consumption to the actual traffic;

– applying power saving features;

– developing the sharing of some equipment between operators (when appropriate);

– developing the energy efficiency of software.

2) Actions to improve the circularity of the sector with activities such as:

– increasing the eco-design of ICT goods, networks and services and their associated packaging;

– developing the reuse, reassembly and recycling of products largely.

3) Actions to develop the usage of renewable energy by the sector members, and, in some cases, develop the production of renewable energy by the ICT sector.

4) Actions to develop better knowledge regarding conditions that enable ICT goods networks and services to provide GHG emissions reduction in societies, to leverage such effects while avoiding possible rebound effects.

5) Actions to increase the awareness among ICT sector members and, to a larger extent, to citizens, on the GHG emissions and circular economy stakes in the ICT sector.

Bibliography

[b-SBT method] *Science-based Target Setting Manual – Driving Ambitious Corporate Climate Action V3.0 (draft)*, 2017, Science Based Targets Initiative, accessed 2018-01. <https://sciencebasedtargets.org/wp-content/uploads/2017/04/SBT-Manual-Draft.pdf>

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