Consultation on the Methodology for Measuring the Global Progress of E-waste Legislation

This is a working document on the development of a methodology for measuring the progress on e-waste management legislation globally. It builds on the work of the Sustainable Cycles (SCYCLE) since 2022 hosted by UNITAR (previously by United Nations University), particularly related to the Global e-waste Statistics Partnership (GESP).

This document is submitted to international experts and Member States for gathering feedback and consultation. Upon the collection of inputs, a revised version will be used to inform the ITU work plan on support for e-waste management.

Recipients of this document are invited to:

- Provide feedback on the methodology to calculate global e-waste indicator on legislation.
- Provide suggestions on the practical steps needed to be taken for the implementation of the indicator.
- Support with determining the applicability of the methodology in line with ITU Targets to be discussed at the ITU Plenipotentiary Conference in October 2022.

The feedback will be collected through written comments and through a consultative webinar to be held at **18 May at 3 PM Central European Time**. We request all recipients to kindly send their written comments by **31 July 2022**.

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1. Introduction
1.1. Background

In 2018, the highest-level policy-making body of the ITU, the Plenipotentiary Conference, established global targets relating to e-waste. The targets set by the ITU Plenipotentiary Conference are:
- Target 3.2: By 2023, increase the global e-waste recycling rate to 30%.
- Target 3.3: By 2023, raise the percentage of countries with e-waste legislation to 50%.

Since 2018, the performance of ITU Member States towards these targets have been tracked using a methodology developed by the SCYCLE programme, previously hosted by the United Nations University, and since 2022 hosted by the United Nations Institute for Training and Research (UNITAR). The methodology has been deployed by the Global E-waste Statistics Partnership (GESP) and the latest results are available in Annex 3 of The Global E-waste Monitor 2023. ITU Target 3.2 has been globally and publicly consulted together with the Partnership for Measuring ICT for Development and is also used for the monitoring of the Sustainable Development Goals (SDGs) for two indicators in SDG 12 on Sustainable consumption and production. Data collection takes place through Eurostat, Organisation for Economic Co-operation and Development (OECD), United Nations Statistics Division (UNSD) / United Nations Environment Programme questionnaires, and UNITAR databases. UNITAR is the co-custodian for data delivery for e-waste to the SDGs process for SDG 12. Through collaboration with UNITAR, the ITU can currently measure the performance of Member States towards ITU Target 3.2. The methodology is used and described in the Global E-waste Monitors by the GESP which is made up of a partnership between UNITAR and ITU.

For the ITU Target 3.3, measurement is currently based on the methodology developed by the SCYCLE programme; however, it has not been globally and publicly consulted, nor described in technical terms, as the Global E-waste Monitors are mainly providing high-level findings. The Global E-waste Monitor 2020 estimated that 71% of the global population, which corresponds to 78 countries, is covered by either a policy, legislation, or regulation governing e-waste management. This estimate includes both legally binding and non-legally binding instruments (e.g., policy, legislation and regulation).

It should be noted that the rate of implementation and enforcement of existing legislation varies across countries, which may result in significantly different local realities in terms of the environmentally sound management of e-waste. Implementation can be affected by the available resources and efficiency of the custodian entity(ies) at the national level. In recent years, countries with more established waste management systems - namely the EU member states - have been focusing more and more on advancing circular solutions such as repair, reuse, and the prevention of waste arisings, which could affect e-waste management too. For many other countries in the world, the priority simply remains to set an enforceable regulatory framework governing e-waste management with realistic targets, clear definitions, and accompanying technical standards and guidelines, mostly with the objective to increase collection.

There have been some reports of inaccuracies with the results of the use of the current methodology. For example, Annex 3 of the Global E-waste Monitor 2020 is not entirely accurate with its depiction of the current coverage of e-waste policy, regulation and legislation. It has been identified that some countries indicated as having a national e-waste policy, regulation or legislation indeed do not. Therefore, revisions to the methodology may be required based on the findings from a global consultation. The public consultation of the method, data collection, and validation and indicator definition is essential for ITU to ensure that the most accurate measurement of performance is undertaken to support its Member States in their transition to the better regulation of e-waste management nationally.

To correct some of the inaccuracies with the results provided in the Global E-waste Monitors, the GESP introduced a new heading in Annex 3 of the 2020 Monitor titled "National e-waste legislation/policy or regulation in place". In previous Monitors (2014 and 2017), the heading in the annexes focussed on "regulation". This shift in terminology represents the fact that not all national policy and regulatory instruments are legally-binding, nor do they all carry equal legal interpretation.

To capture the nuances in the progress made by countries regarding e-waste management, a more comprehensive methodology for measurement would be crucial. However, given the varying nature of e-waste policy, regulation and legislation and the overall policy directions by different governments, their implementation and availability of the underlying data, it can be challenging to accurately document progress for all countries. Keeping these challenges in mind, this document proposes a methodology to measure the current legislative progress as a global indicator based on available information.

It will be essential also to ensure the target relating to e-waste policy, regulation and legislation is measured accurately. It will also be essential to ensure that the best data is available when responding to requests from Member States for technical assistance in e-waste policy and regulatory development. Therefore, the methodology and indicator definition for ITU Target 3.3 is documented in this report, and publicly consulted by ITU and UNITAR. It is intended to be used internally to support the ITU in its monitoring of ITU Targets set by Member States at the ITU Plenipotentiary Conference.

1.2. Objectives

In line with the general objective of the ITU Target 3.3, this document describes the methodology and indicator definition for that global target, with the aim to publicly consult key stakeholders in the world of e-waste regulatory matters and data collection to gather consensus on the proposed revised methodology. The indicator intends to measure the progress in national e-waste management policy, regulation and legislation, comparable across countries, added up to a global total.

2. Measuring e-waste policy, regulation and legislation

The policy instruments governing e-waste management at the national level differ from country to country. Therefore, a general framework with definitions of key terminology is needed which is sufficiently detailed to cover the most important aspects, but not be overly complicated. Next to that, it should be fit for purpose to construct indicators for it that can track the progress at national, regional, or global level, and communicate the messages of the progress with these national policy instruments covering e-waste. It will assist in the already established e-waste statistics collection of the GESP, thus aiding the creation of the overview of the progress in the context of global best practices by guiding countries towards establishing sustainable e-waste management systems.

2.1. Uses of e-waste legislation indicator

An indicator for measuring progress with the development of e-waste policy, regulation and legislation has several applications.
- Measuring the global progress of ITU Target 3.3 at the global level.
- The improved method will be the basis of the legislation indicator used in future Global E-waste Monitors.
- The indicator will make it possible for countries to quantify and measure progress and take actions accordingly.
- It will facilitate the communication of progress to policymakers and help identify where support is needed.
- It will serve as a guide for setting priorities for international cooperation.
- It will ensure that accurate information is available so that international financing can be allocated in an efficient manner.

2.2. Criteria for selection

The following criteria are identified for selecting the indicator.

a) Availability of data or information on which the indicator is built:
- Data or information is currently available for > 90% of countries.
- Data or information is available from, or provided by, a regularly updated data source (registry, on-going reporting etc.), and should not place additional burden on countries.

b) Characteristics of the indicator:
- It is directly related to the performance of e-waste management legislation.
- It is measurable and comparable across countries.
- It can be aggregated from national level to regional or global totals.
- It can be easily interpreted and communicated to various users and audiences.
- It is transparent in terms of the methodology and data used to calculate, which can be verified by third parties.
- The method has been reviewed by international experts.

c) Relevance of the indicator to its purpose:
- The direction or messages derived from the indicator are easily interpretable.
- There is a relevant benchmark (among countries).
- The indicator does not overlap and is conceptually consistent with existing frameworks (e.g. SDG 12, e-waste statistics framework etc.).

Note: These criteria, when applied systematically, can help develop the indicator that reflects the state of e-waste management legislation in a given country. On its own, the indicator does not give direction to the quality, implementation or state of enforcement of legislation. However, in combination with the already approved e-waste statistics datasets, it will facilitate the understanding of legislation in the overall performance of countries across the globe and their national e-waste management systems.

2.3. Key terminology

Establishing clear terminology around policy and legal framework options for governing e-waste management is critical to ensure that global progress in this regard across countries is not misinterpreted. There are typically four types of documents developed nationally which individually present vision, strategic direction, intention, definitions and legal obligations related to e-waste management.

As a basis, a national e-waste management strategy is often a high-level and not legally binding document. It is designed to inform stakeholders about how the country will reach set objectives for the e-waste management system and how such a vision will be achieved. A national e-waste management strategy often spells out the priority areas for e-waste management as a whole but can equally be developed to explore a particular approach for specific sectors within the electronics value chain. Due to it being a high-level document, a strategy is also well-suited to use in the context of a regional approach to e-waste management where there may be more uncertainty about the future of e-waste management.

Also quite high-level is a national e-waste management policy. A policy as such is a statement of intent by the government to tackle a particular issue, in this case e-waste management. It is a non-legally binding document. Policy documents normally contain specific policy objectives, strategies for these objectives, and action plan and in some cases preliminary definitions and targets. A national e-waste management policy is often a plan or course of action set out by the government. This can take place at for instance the municipal, provincial, or national levels.

Strategy and policy documents are not legally binding and are therefore not possible to enforce. They do not set obligations for the different stakeholders in e-waste management. However, e-waste legislation or regulation do set legally binding obligations for stakeholders. A national legislation (also can be called a decree or act in some instances) represents the overarching principles for a particular topic. Normally, the overarching legislation covers the environment at large and often makes provisions for waste in general. From these, regulations can be developed to help with the enforcement of specific aspects. National legislation may give a particular Minister the provision to develop regulation. Regulation implies the way a legislation is legally enforced by regulators.

Strategies, policies, legislation and regulations are not mutually exclusive, as they can co-exist in a country. In some cases, a strategy is developed first and then policies and legislation. However, a strategy on e-waste management may well be developed by government even if a national e-waste regulation is already in place. The same applies to a policy. The regulation may govern the enforcement of e-waste management in a particular way, yet the strategy or policy may be developed to explore a change in direction, vision or strategy of the existing legal framework.

2.4. Application of the framework and indicators

This part provides a comprehensive application of the methodology and the calculation of a headline indicator to track global progress. It aims to provide a stepwise approach for making the process as transparent as possible whilst establishing an indicator that respects the criteria previously explained. Our approach follows the principles of the so-called "Information Pyramid" illustrated in the figure below.
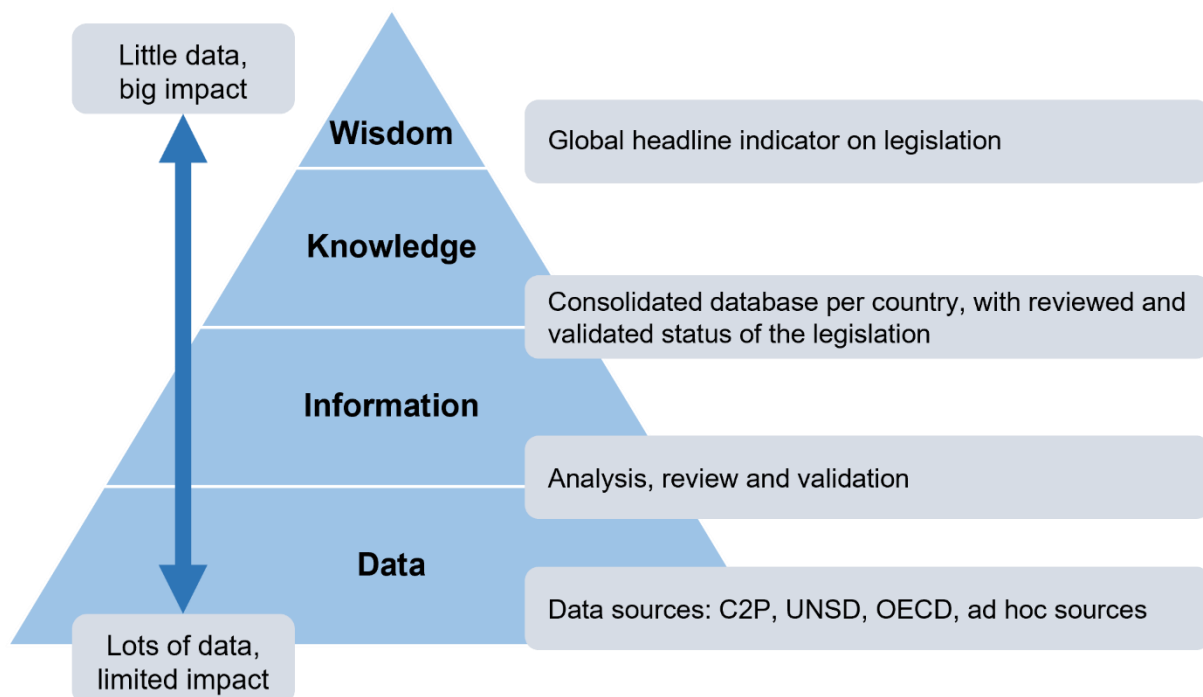

Figure 1 The DIKW pyramid, also known as the DIKW hierarchy, wisdom hierarchy, knowledge hierarchy, information hierarchy, information pyramid, and the data pyramid[1]

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[1] https://en.wikipedia.org/wiki/DIKW_pyramid

As per these principles, the methodology uses a bottom-up approach, by making use of the secondary and primary data from multiple sources as well as the analysis, interpretation, and validation of the data to create useful insights. The methodology can be divided into two stages. The first stage, data is gathered, analysed, reviewed and validated against a methodology. The review and validation involves a robust process of critically reviewing and comparing the analysed records against information gathered from all data sources. The outcome of the raw data analysis, review and validation with the methodology will lead to a consolidated database, in which per country the data is stored. This then can be used to calculate the global headline indicator on e-waste legislation. The data gathering, analysis, review and validation is illustrated below in Figure 2 and is described in the following section 3.2, the computation of the headline indicator is described in section 3.3.
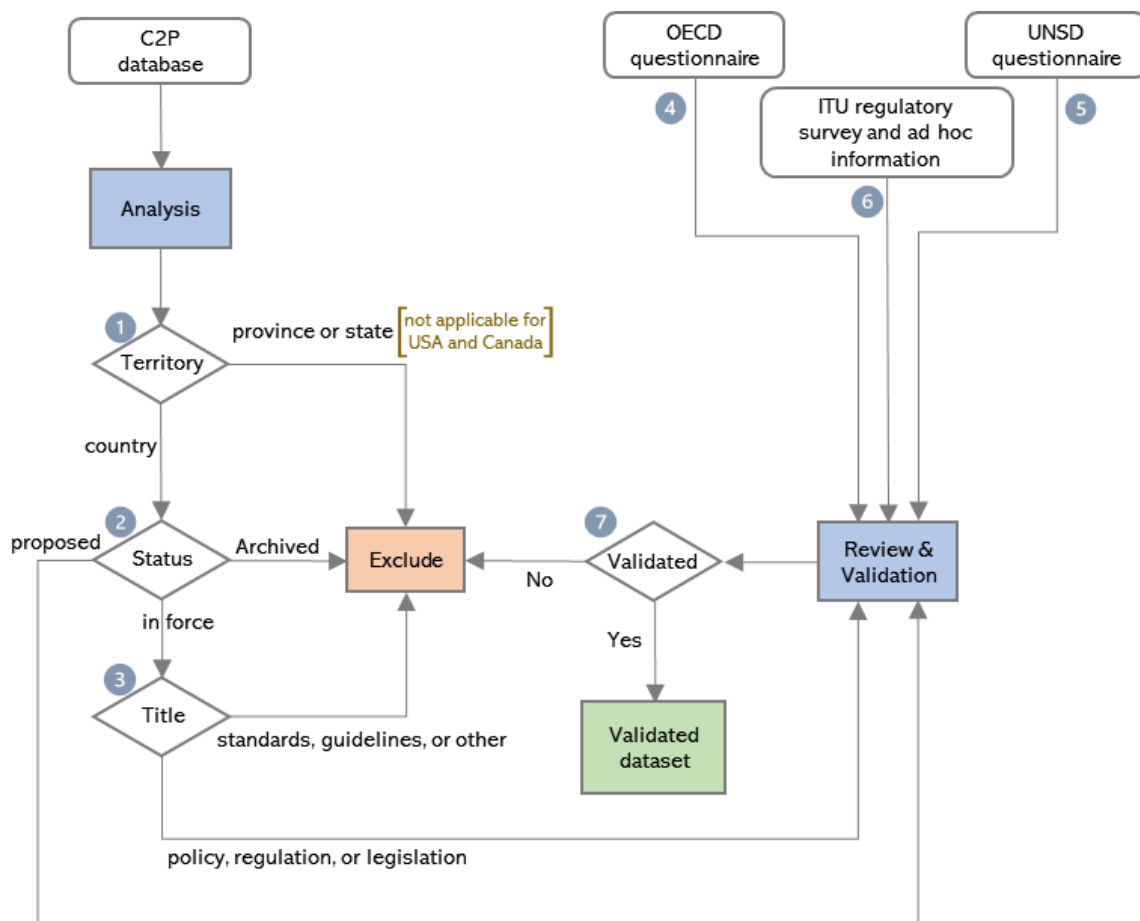

Figure 2 Illustration of the methodological approach to the selection of data to include in calculating the indicator

Data gathering, analysis, review and validation

As a first step, the data is gathered from the Compliance to Product (C2P[2]) dataset, which is a compliance knowledge management system for regulations, standards, and management globally for various areas including e-waste. The C2P dataset includes detailed information on legislative measures (including policies, regulations, legislation, and other measures such as guidelines and standards) at national and state or province levels as well as other details such as status, dates and the web reference. It currently has 645 records for e-waste policy, legislation and regulation with each record describing the territory in which these instruments are present. The C2P registry does not include guidelines and standards for e-waste recyclers, however, only covers national legally- and non-legally binding instruments. The subsequent analysis stage involves a systematic review of each record in the dataset, with the stepwise approach described below.

Step 1: As the first step, the geographical scope of the recorded measure is checked in the 'Territory Covered' column. Only those implemented at the national level are included in the next step and others that are at state or province levels are excluded. For USA and Canada, a State, provincial level analysis is done.

Step 2: In the second step, the 'Status' of the measure in the record is analysed. Only the records with 'In force' status are included in the next steps and those with 'Archived' status are excluded. The records with 'Proposed' status are not excluded right away, instead are considered for the 'Review & Validation' stage, which is detailed in the next section.

Step 3: In the final step, the record is analysed to determine the type of the measure. If the measure qualifies as a policy, a regulation or a legislation concerning e-waste, WEEE, specific categories or products within the definition of e-waste[3], then it is considered for the 'Review and Validation' stage. Other measures including recycling standards, certification programmes, and technical guidelines as well as those that do not cover e-waste in their scope are excluded.

Step 4: After the C2P dataset has been analyses, the intermediate outcomes are further validated validating them based on the information gathered from other data sources, such as the outcomes of questionnaires received from the UNSD[4],the OECD[5] and the ITU (through its annual World Telecommunication/ICT Regulatory Survey[6]). The goal of this stage is twofold: to validate outcomes of the analysis of the C2P dataset, or to correct outcomes, as the analysis of the C2P dataset could be challenging due to a lack of clarity that may arise due to the translation of the title of the recorded measures. In this step, the record is validated against the responses received from countries for the OECD questionnaire and the ITU Regulatory Survey.

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[2] https://www.complianceandrisks.com/c2p-platform/

[3] "E-Waste is a term used to cover items of all types of electrical and electronic equipment and its parts that have been discarded by the owner as waste without the intention of re-use." StEP (2014) https://www.step-initiative.org/e-waste-challenge.html

[4] https://unstats.un.org/unsd/envstats/questionnaire

[5] https://stats.oecd.org/

[6] https://www.itu.int/en/ITU-D/Regulatory-Market/Pages/RegulatorySurvey.aspx

The OECD questionnaire is co-developed by the SCYCLE team as part of the international initiative to document e-waste related information and sent by the OECD to its member countries. Among others, the questionnaire includes a specific question on existing national e-waste legislation, its content and scope, and the custodian entity. These details are compared with the outcome of the Analysis for each OECD country. At the same time, the ITU Regulatory Survey is used to compare with the outcome of the Analysis. This survey covers a wide range of ICT policy and regulatory issues and allows to track the latest ICT trends and evolutions, including some key aspects of the regulatory environment of e-waste management. The survey includes a specific question on existing national e-waste legislation.

Step 5: The previous step validates the records only for OECD countries. For the rest, in this step, the records are reviewed and validated based on the responses received through a similar questionnaire survey conducted by the United Nations Statistics Division (UNSD). Similar to the OECD questionnaire and the environmental part of the ITU survey, the USND questionnaire is developed for documenting e-waste related information for non-OECD countries.

Step 6: In this step, the records are compared against other ad hoc sources and from the review of existing literature and previous studies. These sources also include country workshops conducted by the SCYCLE team as part of the capacity building initiatives under the Global e-waste Statistics Partnership. They also include information drawn from ITU's national e-waste policy and regulatory development technical assistance which is provided directly to national governments.

Step 7: Once each record is carefully reviewed against these three sets of supplementary information, the final decision is made on whether to include them to calculate the indicator. If validated, the record will be included in the calculation of the indicator, otherwise it will be excluded.

The outcome of the data gathering, analysis, review and validation is the consolidated database, in which per country the data is stored.

Global headline indicators

At this point, the global headline indicator can now be calculated using the validated dataset produced through the methodology described in section 3.2. Two headline indicators can be constructed from this:

1) The total number of countries having national e-waste legislation (unit: number of countries).

2) Share of the global population covered under national e-waste legislation (unit: percentage).

Indicator 1 is calculated by adding up all countries in the consolidated dataset which are marked with a 'Yes' for having "e-waste legislation", as defined in section 2.3 for "National E-waste policy", "National E-waste Legislation", or "National E-waste Regulation". Countries with only e-waste strategies are excluded from the indicator calculation. Each country is weighted equally and leads to a number. For instance, globally, 71 countries are covered by national e-waste legislation.

Indicator 2 is calculated by multiplying the countries marked as under indicator 1 with their population and dividing that by the global population. This is multiplied by 100 percent.

Alternatively, similar regional indicators covering several countries, such as a political union, such as European Union, or a continent, such as African continent, or a sub-region, such as Central Asia, can be constructed from the same datasets.

Limitations

Two key limitations are identified that relate to a) the quality of available data used in the calculation of the indicator and b) the somewhat restrictive nature of the global indicator concerning its applicability at the national level.

Data quality:

The methodology relies on the most suitable and best available sources of information for the purpose of calculating the indicator. Nevertheless, gaps remain in certain aspects of these datasets including the availability of information for all countries and the consistency of the available data from different sources (in particular government ministries, departments, agencies and regulators) across countries. The C2P database theoretically covers each country in the world, however, might have missing countries. Next to that, response rates to the UNSD questionnaire are significantly lower than 100%, which makes the validation of existing legislation in the non-OECD countries less robust, whilst the ITU Regulatory Survey is addressed only to the ICT regulatory community. This is compensated as much as possible through review of literature and other sources of available secondary information but in the case of data and information unavailability, the records cannot be validated.

Applicability:

The headline global indicator reflects the legislative process of a region or the entire world. It does not reflect legislative progress at national levels, which limits its applicability for individual countries to improve specific aspects of their legislative initiatives, in particular from an implementation and enforcement perspective.

Looking to the future, the GESP would like to further develop the methodology to increase its level of detail vis-a-vis the measurement of the performance of national legally binding e-waste instruments. A national indicator in this sense would require a significant level of investment and time but it would result in a better understanding of the challenges faced by governments when it comes to the implementation and enforcement of e-waste legislation and regulation.